Dignity Health.
Mercy San Juan Medical Center

Department of Nuclear Medicine
Mercy San Juan Medical Center
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November 7, 2017

To Whom It May Concern,

Imaging Services staff and management team have had the pleasure of working with the Antelope High School clinical internship students since August 2016. The students have been rotating through the different modalities in our Imaging Services Department, including: Diagnostic Imaging, CT, MRI, Interventional Radiology, Neuro-Interventional Radiology, Nuclear Medicine, Ultrasound, and EKG. These interns have been exemplary with regards to helping support our staff and our patients. It is my pleasure to write you of our experiences with and strong regard for Antelope High School's biomedical sciences program.

The program at Antelope High School is incomparable in the preparation of its students. Each semester 8 to 10 seniors have interned at our hospital for 14 weeks. Each student arrives with a competency checklist that reflects the depth and rigor of the program at Antelope High School. Prior to their arrival to start their clinical program at our facility, they are trained in patient bedside manner, patient moving and feeding, taking patient vitals, reading EKGs, Basic Life Saving/CPR, HIPAA, and medical terminology. Because of this training, these high school student interns have a solid advantage in successfully navigating the dynamic work environment and effectively interact with our patients and staff.

In addition to their clinical skillset, the Antelope High School students demonstrate superior communication and interpersonal skills as compared to those in their cohort that we have encountered from other sites. Each student brings his/her unique combination of energy, enthusiasm and determination that sets them apart from the rest. Each is eager to learn and digest new information as well as acknowledge mistakes and use these to improve performance. The supervisory team attributes the student tenacity and preparedness to the PLTW biomedical sciences program at Antelope High School. It is wonderful to know that the talented instructors in career readiness pathways such as these are so very dedicated to preparing the biomedical professional of the future.

It is without reservation that I support this program and look forward to the future of our partnership; Antelope High School and Mercy San Juan Medical Center Imaging Services.

Sincerely,

Jann Cardosa

Jann Cardosa
Manager Imaging Services, Mercy San Juan Medical Center

BloodSource®

October 27th, 2017

To whom it may concern,

I have had the pleasure of working with Antelope High School for the duration of my career at BloodSource. Altogether Antelope High School has partnered with BloodSource for 10 years to run successful blood drives. The biomedical club at Antelope High School has been an exceptional partner and continually runs successful blood drives. They have been recognized in our region for multiple awards over the years including "Blood Drive of the Year", "Greatest Increase Over Previous Years Blood Drives", "Most Pints Collected at a Singe Drive" and "Most Registered Donors".

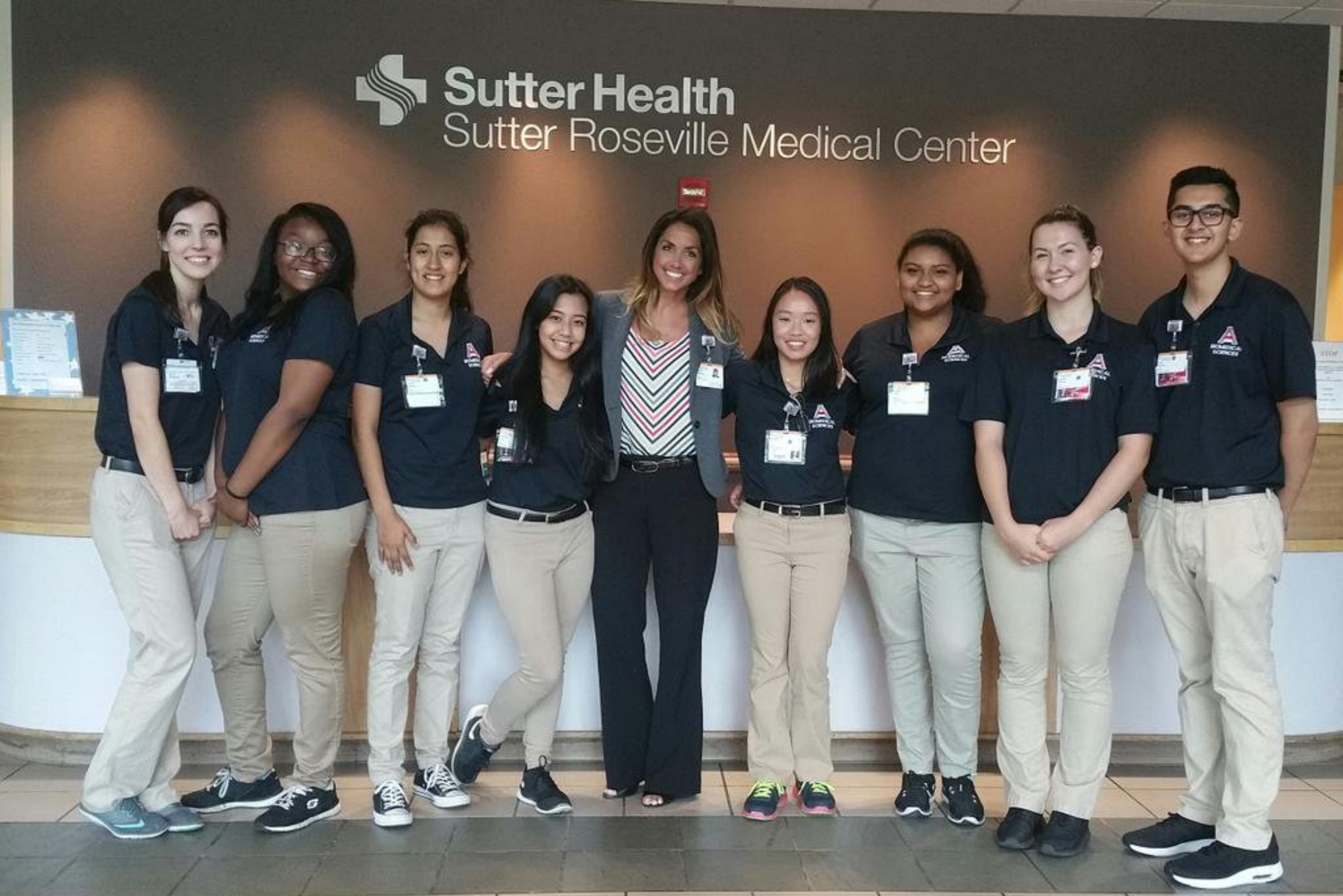
The biomedical program has gone above and beyond in their partnership with our company. One way that they have done this is by running 2 blood drives a year. At these blood drives they send personal invitations to every student and staff member who is eligible to donate blood. This has resulted in a high number of first time donors being registered to donate blood. Another way that the biomedical program has demonstrated exemplary partnership is when they helped host an extra blood drive during the school year. They usually host two blood drives a year but when BloodSource was in need of extra blood one year they came through and hosted a 3rd drive at their site.

Furthermore, the students that this program produces are outstanding. We partner with the Antelope Biomedical Program and host field trips at our BloodSource laboratory site. The students who attend are involved, knowledgeable and respectful. The students are competent, hardworking and possess great interpersonal and soft skills. This is a reflection of the caliber of student that this program produces.

Because of the above mentioned reasons, I would consider the Biomedical Science Pathway at Antelope High School to be an exceptional Program!

Respectfully submitted,

Ian Finch
Donor Recruitment Representative
BloodSource
10536 Peter A McCuen Blvd, Mather CA 95655
Direct (916) 453-3044 | Mobile (707) 685-1140


Sutter Health
Sutter Roseville Medical Center


PERRY
OUTREACH
PROGRAM
JEWEL
PERRY
OUTREACH
PROGRAM


Unit 3
GEOLOGIC PROCESSES
layers of the Earth
Crust 0-100 km
Mantle
Outer core
Inner core
To Scale


RED ZONE
Student
TITANS
Section

Principles of Biomedical Science (PBS)

Common Core State Standards for English Language Arts

Lesson 1.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.5 - Language

Demonstrate understanding of word relationships and nuances in word meanings.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Principles of Biomedical Science (PBS)

Common Core State Standards for English Language Arts

Lesson 1.2

AS.R.4 - Reading

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

Principles of Biomedical Science (PBS)

Common Core State Standards for English Language Arts

Lesson 1.3

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.4 - Reading

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.6 - Speaking and Listening

Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering

vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Principles of Biomedical Science (PBS)

Common Core State Standards for English Language Arts

Lesson 2.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.4 - Reading

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering

vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Principles of Biomedical Science (PBS)

Common Core State Standards for English Language Arts

Lesson 2.2

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.4 - Reading

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Principles of Biomedical Science (PBS)

Common Core State Standards for English Language Arts

Lesson 2.3

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.4 - Reading

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.3 - Writing

Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Principles of Biomedical Science (PBS)

Common Core State Standards for English Language Arts

Lesson 3.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.4 - Reading

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

AS.R.6 - Reading

Assess how point of view or purpose shapes the content and style of a text.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.3 - Writing

Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.3 - Speaking and Listening

Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Principles of Biomedical Science (PBS)

Common Core State Standards for English Language Arts

Lesson 3.2

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.4 - Reading

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Principles of Biomedical Science (PBS)

Common Core State Standards for English Language Arts

Lesson 3.3

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.4 - Reading

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Principles of Biomedical Science (PBS)

Common Core State Standards for English Language Arts

Lesson 3.4

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.4 - Reading

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.8 - Reading

Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Principles of Biomedical Science (PBS)

Common Core State Standards for English Language Arts

Lesson 4.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.4 - Reading

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

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AS.L.1 - Language

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Principles of Biomedical Science (PBS)

Common Core State Standards for English Language Arts

Lesson 4.2

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.4 - Reading

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.8 - Reading

Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

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Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

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Principles of Biomedical Science (PBS)

Common Core State Standards for English Language Arts

Lesson 4.3

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.4 - Reading

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

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Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

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Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Principles of Biomedical Science (PBS)

Common Core State Standards for English Language Arts

Lesson 4.4

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.4 - Reading

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.8 - Reading

Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.3 - Writing

Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Principles of Biomedical Science (PBS)

Common Core State Standards for English Language Arts

Lesson 5.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.4 - Reading

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Principles of Biomedical Science (PBS)

Common Core State Standards for English Language Arts

Lesson 6.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.4 - Reading

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.8 - Reading

Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

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Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.L.1 - Language

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Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

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Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Principles of Biomedical Science (PBS)

Common Core State Standards for Mathematics

Lesson 1.1

N.Q .1 - Quantities

Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

A.CED.1 - Creating Equations

Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

A.REI.3 - Reasoning with Equations and Inequalities

Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

A.REI.10 - Reasoning with Equations and Inequalities

Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Principles of Biomedical Science (PBS)

Common Core State Standards for Mathematics

Lesson 1.2

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Principles of Biomedical Science (PBS)

Common Core State Standards for Mathematics

Lesson 1.3

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Principles of Biomedical Science (PBS)

Common Core State Standards for Mathematics

Lesson 2.1

N.Q .1 - Quantities

Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N.Q .3 - Quantities

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

S.ID.1 - Interpreting Categorical and Quantitative Data

Represent data with plots on the real number line (dot plots, histograms, and box plots).

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Principles of Biomedical Science (PBS)

Common Core State Standards for Mathematics

Lesson 2.2

N.Q .1 - Quantities

Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N.Q .3 - Quantities

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

A.CED.1 - Creating Equations

Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

A.REI.1 - Reasoning with Equations and Inequalities

Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Principles of Biomedical Science (PBS)

Common Core State Standards for Mathematics

Lesson 2.3

N.Q .2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

N.Q .3 - Quantities

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

S.ID.1 - Interpreting Categorical and Quantitative Data

Represent data with plots on the real number line (dot plots, histograms, and box plots).

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Principles of Biomedical Science (PBS)

Common Core State Standards for Mathematics

Lesson 3.1

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Principles of Biomedical Science (PBS)

Common Core State Standards for Mathematics

Lesson 3.2

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Principles of Biomedical Science (PBS)

Common Core State Standards for Mathematics

Lesson 3.3

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Principles of Biomedical Science (PBS)

Common Core State Standards for Mathematics

Lesson 3.4

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

S.MD.5.a - Using Probability to Make Decisions

Find the expected payoff for a game of chance. For example, find the expected winnings from a state lottery ticket or a game at a fast-food restaurant.

S.MD.6 - Using Probability to Make Decisions

(+) Use probabilities to make fair decisions (e.g., drawing by lots, using a random number generator).

Principles of Biomedical Science (PBS)

Common Core State Standards for Mathematics

Lesson 4.1

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Principles of Biomedical Science (PBS)

Common Core State Standards for Mathematics

Lesson 4.2

N.Q .1 - Quantities

Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N.Q .2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

N.Q .3 - Quantities

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

S.MD.7 - Using Probability to Make Decisions

(+) Analyze decisions and strategies using probability concepts (e.g., product testing, medical testing, pulling a hockey goalie at the end of a game).

Principles of Biomedical Science (PBS)

Common Core State Standards for Mathematics

Lesson 4.3

N.Q .2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Principles of Biomedical Science (PBS)

Common Core State Standards for Mathematics

Lesson 4.4

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Principles of Biomedical Science (PBS)

Common Core State Standards for Mathematics

Lesson 5.1

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Principles of Biomedical Science (PBS)

Common Core State Standards for Mathematics

Lesson 6.1

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Principles of Biomedical Science (PBS)

National Health Science

Lesson 1.1

1.31 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate competency in basic math skills and mathematical conversions as they relate to healthcare.

a. Metric system (such as: centi, milli, kilo)

b. Mathematical (average, ratios, fractions, percentages, addition, subtraction, multiplication, division)

c. Conversions (height, weight/mass, length, volume, temperature, household measurements)

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

4.32 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Distinguish differences among careers within health science pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).

4.41 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Develop components of a personal portfolio.

a. Letter of introduction

b. Resume

c. Sample Projects

d. Writing Sample

e. Work-based Learning Documentation

f. Oral Report

g. Service Learning/Community Service

h. Credentials

i. Technology Skills

j. Leadership Examples

7.31 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Apply safety techniques in the work environment.

a. Ergonomics

b. Safe operation of equipment

c. Patient/client safety measures (check area for safety)

7.41 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Observe all safety standards related to the Occupational Exposure to Hazardous Chemicals Standard (Safety Data Sheets (SDSs)). (www.osha.gov)

7.42 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Comply with safety signs, symbols, and labels.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

Principles of Biomedical Science (PBS)

National Health Science

Lesson 1.2

1.23 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe biomedical therapies as they relate to the prevention, pathology, and treatment of disease.

a. Gene testing

b. Gene therapy

c. Human proteomics

d. Cloning

e. Stem cell research

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

4.32 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Distinguish differences among careers within health science pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).

7.31 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Apply safety techniques in the work environment.

a. Ergonomics

b. Safe operation of equipment

c. Patient/client safety measures (check area for safety)

7.41 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Observe all safety standards related to the Occupational Exposure to Hazardous Chemicals Standard (Safety Data Sheets (SDSs)). (www.osha.gov)

7.42 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Comply with safety signs, symbols, and labels.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

Principles of Biomedical Science (PBS)

National Health Science

Lesson 1.3

1.11 Foundation Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Identify basic levels of organization of the human body

a. Chemical

b. Cellular

c. Tissue

d. Organs

e. Systems

f. Organism

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

4.32 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Distinguish differences among careers within health science pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).

5.21 Foundation Standard 5: Legal Responsibilities: Describe legal responsibilities, limitations, and implications on healthcare worker actions.

Apply standards for the safety, privacy and confidentiality of health information (HIPAA, privileged communication).

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

11.21 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply fundamentals of privacy and confidentiality policies and procedures (HIPAA).

11.22 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify legal and regulatory requirements related to the use of personal health information (such as: Health Information Technology Act—HITECH Act, American Recovery and Reinvestment Act—ARRA).

11.23 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify common policies and procedures for proper access, disclosure and protection of personal health information (such as: passwords, administrative safeguards, database security).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

Principles of Biomedical Science (PBS)

National Health Science

Lesson 2.1

1.11 Foundation Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Identify basic levels of organization of the human body

a. Chemical

b. Cellular

c. Tissue

d. Organs

e. Systems

f. Organism

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

7.31 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Apply safety techniques in the work environment.

a. Ergonomics

b. Safe operation of equipment

c. Patient/client safety measures (check area for safety)

7.41 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Observe all safety standards related to the Occupational Exposure to Hazardous Chemicals Standard (Safety Data Sheets (SDSs)). (www.osha.gov)

7.42 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Comply with safety signs, symbols, and labels.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

9.11 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Promote behaviors of health and wellness (such as: nutrition, weight control, exercise, sleep habits).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Principles of Biomedical Science (PBS)

National Health Science

Lesson 2.2

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.31 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate competency in basic math skills and mathematical conversions as they relate to healthcare.

a. Metric system (such as: centi, milli, kilo)

b. Mathematical (average, ratios, fractions, percentages, addition, subtraction, multiplication, division)

c. Conversions (height, weight/mass, length, volume, temperature, household measurements)

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

7.41 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Observe all safety standards related to the Occupational Exposure to Hazardous Chemicals Standard (Safety Data Sheets (SDSs)). (www.osha.gov)

7.42 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Comply with safety signs, symbols, and labels.

7.51 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Practice fire safety in a healthcare setting.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

9.11 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Promote behaviors of health and wellness (such as: nutrition, weight control, exercise, sleep habits).

9.12 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Describe strategies for prevention of disease.

a. Routine physical exams

b. Medical, dental, and mental health screenings

c. Community health education outreach programs

d. Immunizations

e. Stress management

f. Avoid risky behaviors

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

Principles of Biomedical Science (PBS)

National Health Science

Lesson 2.3

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.23 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe biomedical therapies as they relate to the prevention, pathology, and treatment of disease.

a. Gene testing

b. Gene therapy

c. Human proteomics

d. Cloning

e. Stem cell research

1.31 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate competency in basic math skills and mathematical conversions as they relate to healthcare.

a. Metric system (such as: centi, milli, kilo)

b. Mathematical (average, ratios, fractions, percentages, addition, subtraction, multiplication, division)

c. Conversions (height, weight/mass, length, volume, temperature, household measurements)

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

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Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

4.32 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Distinguish differences among careers within health science pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).

7.31 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Apply safety techniques in the work environment.

a. Ergonomics

b. Safe operation of equipment

c. Patient/client safety measures (check area for safety)

7.41 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Observe all safety standards related to the Occupational Exposure to Hazardous Chemicals Standard (Safety Data Sheets (SDSs)). (www.osha.gov)

7.42 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Comply with safety signs, symbols, and labels.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

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f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

9.11 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Promote behaviors of health and wellness (such as: nutrition, weight control, exercise, sleep habits).

9.12 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Describe strategies for prevention of disease.

a. Routine physical exams

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c. Community health education outreach programs

d. Immunizations

e. Stress management

f. Avoid risky behaviors

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Principles of Biomedical Science (PBS)

National Health Science

Lesson 3.1

1.11 Foundation Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Identify basic levels of organization of the human body

a. Chemical

b. Cellular

c. Tissue

d. Organs

e. Systems

f. Organism

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.23 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe biomedical therapies as they relate to the prevention, pathology, and treatment of disease.

a. Gene testing

b. Gene therapy

c. Human proteomics

d. Cloning

e. Stem cell research

1.31 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate competency in basic math skills and mathematical conversions as they relate to healthcare.

a. Metric system (such as: centi, milli, kilo)

b. Mathematical (average, ratios, fractions, percentages, addition, subtraction, multiplication, division)

c. Conversions (height, weight/mass, length, volume, temperature, household measurements)

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

4.32 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Distinguish differences among careers within health science pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).

7.31 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Apply safety techniques in the work environment.

a. Ergonomics

b. Safe operation of equipment

c. Patient/client safety measures (check area for safety)

7.41 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Observe all safety standards related to the Occupational Exposure to Hazardous Chemicals Standard (Safety Data Sheets (SDSs)). (www.osha.gov)

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Comply with safety signs, symbols, and labels.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

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Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

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Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

Principles of Biomedical Science (PBS)

National Health Science

Lesson 3.2

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d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

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Model verbal and nonverbal communication.

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Identify the differences between subjective and objective information.

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Practice speaking and active listening skills.

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Modify communication to meet the needs of the patient/client and be appropriate to the situation.

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Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

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Prepare examples of technical, informative, and creative writing.

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Evaluate roles and responsibilities of team members.

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g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

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Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

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Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

Principles of Biomedical Science (PBS)

National Health Science

Lesson 3.3

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

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Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

5.24 Foundation Standard 5: Legal Responsibilities: Describe legal responsibilities, limitations, and implications on healthcare worker actions.

Define informed consent.

6.12 Foundation Standard 6: Ethics: Understand accepted ethical practices with respect to cultural, social, and ethnic differences within the healthcare environment.

Identify ethical issues and their implications related to healthcare (such as: organ donation, in vitro fertilization, euthanasia, scope of practice, ethics committee).

7.31 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Apply safety techniques in the work environment.

a. Ergonomics

b. Safe operation of equipment

c. Patient/client safety measures (check area for safety)

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

Principles of Biomedical Science (PBS)

National Health Science

Lesson 3.4

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.31 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate competency in basic math skills and mathematical conversions as they relate to healthcare.

a. Metric system (such as: centi, milli, kilo)

b. Mathematical (average, ratios, fractions, percentages, addition, subtraction, multiplication, division)

c. Conversions (height, weight/mass, length, volume, temperature, household measurements)

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

4.32 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Distinguish differences among careers within health science pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

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Identify characteristics of effective teams.

a. Active participation

b. Commitment

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e. Flexibility

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g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

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Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

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Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

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Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

Principles of Biomedical Science (PBS)

National Health Science

Lesson 4.1

1.11 Foundation Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Identify basic levels of organization of the human body

a. Chemical

b. Cellular

c. Tissue

d. Organs

e. Systems

f. Organism

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

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Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

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c. Diagnosis

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e. Prevention

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c. Conversions (height, weight/mass, length, volume, temperature, household measurements)

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Model verbal and nonverbal communication.

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Identify the differences between subjective and objective information.

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Practice speaking and active listening skills.

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Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

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Prepare examples of technical, informative, and creative writing.

7.31 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Apply safety techniques in the work environment.

a. Ergonomics

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Comply with safety signs, symbols, and labels.

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Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

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Identify characteristics of effective teams.

a. Active participation

b. Commitment

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Demonstrate use of file organization and information storage.

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Identify uses of basic word processing, spreadsheet, and database applications.

Principles of Biomedical Science (PBS)

National Health Science

Lesson 4.2

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Model verbal and nonverbal communication.

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9.12 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Describe strategies for prevention of disease.

a. Routine physical exams

b. Medical, dental, and mental health screenings

c. Community health education outreach programs

d. Immunizations

e. Stress management

f. Avoid risky behaviors

10.11 *Foundation Standard 10: Technical Skills: Apply technical skills required for all career specialties and demonstrate skills and knowledge as appropriate.

Apply procedures for measuring and recording vital signs including the normal ranges (temperature, pulse, respirations, blood pressure, pain).

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Principles of Biomedical Science (PBS)

National Health Science

Lesson 4.3

1.11 Foundation Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Identify basic levels of organization of the human body

a. Chemical

b. Cellular

c. Tissue

d. Organs

e. Systems

f. Organism

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.23 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe biomedical therapies as they relate to the prevention, pathology, and treatment of disease.

a. Gene testing

b. Gene therapy

c. Human proteomics

d. Cloning

e. Stem cell research

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

4.32 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Distinguish differences among careers within health science pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).

7.31 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Apply safety techniques in the work environment.

a. Ergonomics

b. Safe operation of equipment

c. Patient/client safety measures (check area for safety)

7.41 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Observe all safety standards related to the Occupational Exposure to Hazardous Chemicals Standard (Safety Data Sheets (SDSs)). (www.osha.gov)

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Comply with safety signs, symbols, and labels.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

9.11 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Promote behaviors of health and wellness (such as: nutrition, weight control, exercise, sleep habits).

9.12 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Describe strategies for prevention of disease.

a. Routine physical exams

b. Medical, dental, and mental health screenings

c. Community health education outreach programs

d. Immunizations

e. Stress management

f. Avoid risky behaviors

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Principles of Biomedical Science (PBS)

National Health Science

Lesson 4.4

1.11 Foundation Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Identify basic levels of organization of the human body

a. Chemical

b. Cellular

c. Tissue

d. Organs

e. Systems

f. Organism

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

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Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

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Model verbal and nonverbal communication.

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Identify the differences between subjective and objective information.

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Practice speaking and active listening skills.

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Modify communication to meet the needs of the patient/client and be appropriate to the situation.

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Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

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Distinguish differences among careers within health science pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

9.11 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Promote behaviors of health and wellness (such as: nutrition, weight control, exercise, sleep habits).

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Describe strategies for prevention of disease.

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b. Medical, dental, and mental health screenings

c. Community health education outreach programs

d. Immunizations

e. Stress management

f. Avoid risky behaviors

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

Principles of Biomedical Science (PBS)

National Health Science

Lesson 5.1

1.11 Foundation Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Identify basic levels of organization of the human body

a. Chemical

b. Cellular

c. Tissue

d. Organs

e. Systems

f. Organism

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.22 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Discuss research related to emerging diseases and disorders (such as: autism, VRSA, PTSD, Listeria, seasonal flu).

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

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Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

4.32 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Distinguish differences among careers within health science pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).

7.11 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Explain principles of infection control.

a. Chain of infection

b. Mode of transmission (direct, indirect, vectors, common vehicle [air, food, water], healthcare-associated infections [nosocomial], opportunistic)

c. Microorganisms (non-pathogenic, pathogenic, aerobic, anaerobic)

d. Classifications (bacteria, protozoa, fungi, viruses, parasites)

7.12 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Differentiate methods of controlling the spread and growth of microorganisms.

a. Aseptic control (antisepsis, disinfection, sterilization, sterile technique)

b. Standard precautions

c. Isolation precautions

d. Blood borne pathogen precautions

e. Vaccinations

7.21 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Apply personal safety procedures based on Occupational Safety and Health Administration (OSHA) and Centers for Disease Control (CDC) regulations.

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Apply safety techniques in the work environment.

a. Ergonomics

b. Safe operation of equipment

c. Patient/client safety measures (check area for safety)

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Comply with safety signs, symbols, and labels.

7.51 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Practice fire safety in a healthcare setting.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

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Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

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Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

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Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Principles of Biomedical Science (PBS)

National Health Science

Lesson 6.1

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a. Chemical

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4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

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Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

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Identify characteristics of effective teams.

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Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

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Demonstrate use of file organization and information storage.

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Identify uses of basic word processing, spreadsheet, and database applications.

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Evaluate validity of web-based resources.

Principles of Biomedical Science (PBS)

Next Generation Science Standards

Lesson 1.1

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Asking questions and defining problems

Evaluate a question to determine if it is testable and relevant.

Science and Engineering Practice - Asking questions and defining problems

Ask questions that can be investigated within the scope of the school laboratory, research facilities, or field (e.g., outdoor environment) with available resources and, when appropriate, frame a hypothesis based on a model or theory.

Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan an investigation or test a design individually and collaboratively to produce data to serve as the basis for evidence as part of building and revising models, supporting explanations for phenomena, or testing solutions to problems. Consider possible confounding variables or effects and evaluate the investigation's design to ensure variables are controlled.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan and conduct an investigation or test a design solution in a safe and ethical manner including considerations of environmental, social, and personal impacts.

Science and Engineering Practice - Planning and Carrying Out Investigations

Select appropriate tools to collect, record, analyze, and evaluate data. Make directional hypotheses that specify what happens to a dependent variable when an independent variable is manipulated.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Make a quantitative and/or qualitative claim regarding the relationship between dependent and independent variables.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Crosscutting Concepts - Patterns

Different patterns may be observed at each of the scales at which a system is studied and can provide evidence for causality in explanations of phenomena.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Cause and effect relationships can be suggested and predicted for complex natural and human designed systems by examining what is known about smaller scale mechanisms within the system.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Changes in systems may have various causes that may not have equal effects.

Crosscutting Concepts - Scale, Proportion, and Quantity

Algebraic thinking is used to examine scientific data and predict the effect of a change in one variable on another (e.g., linear growth vs. exponential growth).

Crosscutting Concepts - Systems and System Models

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

Crosscutting Concepts - Systems and System Models

Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales.

Crosscutting Concepts - Systems and System Models

Models can be used to predict the behavior of a system, but these predictions have limited precision and reliability due to the assumptions and approximations inherent in models.

Crosscutting Concepts - Structure and Function

The way an object is shaped or structured determines many of its properties and functions.

Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Principles of Biomedical Science (PBS)

Next Generation Science Standards

Lesson 1.2

HS.LS1.1 - From Molecules to Organisms: Structures and Processes

Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS.LS3.1 - Heredity: Inheritance and Variation of Traits

Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells. (HS-LS1-1),(Note: This Disciplinary Core Idea is also addressed by HS-LS3- 1.)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

DCI - LS1.C - From Molecules to Organisms: Structures and Processes - Organization for Matter and Energy Flow in Organisms

The sugar molecules thus formed contain carbon, hydrogen, and oxygen: their hydrocarbon backbones are used to make amino acids and other carbon-based molecules that can be assembled into larger molecules (such as proteins or DNA), used for example to form new cells. (HS-LS1-6)

DCI - LS3.A - Heredity: Inheritance and Variation of Traits - Inheritance of Traits

Each chromosome consists of a single very long DNA molecule, and each gene on the chromosome is a particular segment of that DNA. The instructions for forming species' characteristics are carried in DNA. All cells in an organism have the same genetic content, but the genes used (expressed) by the cell may be

regulated in different ways. Not all DNA codes for a protein; some segments of DNA are involved in regulatory or structural functions, and some have no as-yet known function. (HS-LS3-1)

Science and Engineering Practice - Asking questions and defining problems

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- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Planning and Carrying Out Investigations

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Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

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Science and Engineering Practice - Constructing Explanations and Designing Solutions

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Science and Engineering Practice - Engaging in Argument from Evidence

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The way an object is shaped or structured determines many of its properties and functions.

Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Crosscutting Concepts - Stability and Change

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Principles of Biomedical Science (PBS)

Next Generation Science Standards

Lesson 1.3

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

Science and Engineering Practice - Asking questions and defining problems

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- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Planning and Carrying Out Investigations

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Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

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Principles of Biomedical Science (PBS)

Next Generation Science Standards

Lesson 2.1

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

DCI - PS3.B - Energy - Conservation of Energy and Energy Transfer

The availability of energy limits that can occur in any system. (HS-PS3-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system. (HS-LS1-3)

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Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan an investigation or test a design individually and collaboratively to produce data to serve as the basis for evidence as part of building and revising models, supporting explanations for phenomena, or testing solutions to problems. Consider possible confounding variables or effects and evaluate the investigation's design to ensure variables are controlled.

Science and Engineering Practice - Planning and Carrying Out Investigations

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Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Crosscutting Concepts - Stability and Change

Feedback (negative or positive) can stabilize or destabilize a system.

Principles of Biomedical Science (PBS)

Next Generation Science Standards

Lesson 2.2

HS.LS1.6 - From Molecules to Organisms: Structures and Processes

Construct and revise an explanation based on evidence for how carbon, hydrogen, and oxygen from sugar molecules may combine with other elements to form amino acids and/or other large carbon-based molecules.

HS.LS2.5 - Ecosystems: Interactions, Energy, and Dynamics

Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.

DCI - PS1.A - Matter and Its Interactions - Structure and Properties of Matter

Each atom has a charged substructure consisting of a nucleus, which is made of protons and neutrons, surrounded by electrons. (HS-PS1-1)

DCI - PS1.A - Matter and Its Interactions - Structure and Properties of Matter

The periodic table orders elements horizontally by the number of protons in the atom's nucleus and places those with similar chemical properties in columns. The repeating patterns of this table reflect patterns of outer electron states. (HS-PS1-1)

DCI - PS1.A - Matter and Its Interactions - Structure and Properties of Matter

A stable molecule has less energy than the same set of atoms separated; one must provide at least this energy in order to take the molecule apart. (HS-PS1-4)

DCI - PS3.A - Energy - Definitions of Energy

Energy is a quantitative property of a system that depends on the motion and interactions of matter and radiation within that system. That there is a single quantity called energy is due to the fact that a system's total energy is conserved, even as, within the system, energy is continually transferred from one object to another and between its various possible forms. (HSPS3-1), (HS-PS3-2)

DCI - PS3.A - Energy - Definitions of Energy

At the macroscopic scale, energy manifests itself in multiple ways, such as in motion, sound, light, and thermal energy. (HSPS3-2), (HS-PS3-3)

DCI - PS3.B - Energy - Conservation of Energy and Energy Transfer

Energy cannot be created or destroyed, but it can be transported from one place to another and transferred between systems. (HS-PS3-1), (HS-PS3-4)

DCI - PS3.B - Energy - Conservation of Energy and Energy Transfer

The availability of energy limits that can occur in any system. (HS-PS3-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

DCI - LS1.C - From Molecules to Organisms: Structures and Processes - Organization for Matter and Energy Flow in Organisms

The sugar molecules thus formed contain carbon, hydrogen, and oxygen: their hydrocarbon backbones are used to make amino acids and other carbon-based molecules that can be assembled into larger molecules (such as proteins or DNA), used for example to form new cells. (HS-LS1-6)

DCI - LS1.C - From Molecules to Organisms: Structures and Processes - Organization for Matter and Energy Flow in Organisms

As matter and energy flow through different organizational levels of living systems, chemical elements are recombined in different ways to form different products. (HS-LS1-6), (HS-LS1-7)

DCI - LS1.C - From Molecules to Organisms: Structures and Processes - Organization for Matter and Energy Flow in Organisms

As a result of these chemical reactions, energy is transferred from one system of interacting molecules to another. Cellular respiration is a chemical process in which the bonds of food molecules and oxygen molecules are broken and new compounds are formed that can transport energy to muscles. Cellular respiration also releases the energy needed to maintain body temperature despite ongoing energy transfer to the surrounding environment. (HS-LS1-7)

DCI - LS2.B - Ecosystems: Interactions, Energy, and Dynamics - Cycles of Matter and Energy Transfer in Ecosystems

Photosynthesis and cellular respiration (including anaerobic processes) provide most of the energy for life processes. (HS-LS2-3)

Science and Engineering Practice - Asking questions and defining problems

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Science and Engineering Practice - Asking questions and defining problems

Evaluate a question to determine if it is testable and relevant.

Science and Engineering Practice - Asking questions and defining problems

Ask questions that can be investigated within the scope of the school laboratory, research facilities, or field (e.g., outdoor environment) with available resources and, when appropriate, frame a hypothesis based on a model or theory.

Science and Engineering Practice - Developing and Using Models

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Principles of Biomedical Science (PBS)

Next Generation Science Standards

Lesson 2.3

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.LS1.3 - From Molecules to Organisms: Structures and Processes

Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

HS.ETS1.1 - Engineering Design

Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

HS.ETS1.3 - Engineering Design

Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

DCI - PS3.B - Energy - Conservation of Energy and Energy Transfer

The availability of energy limits that can occur in any system. (HS-PS3-1)

DCI - PS3.B - Energy - Conservation of Energy and Energy Transfer

Uncontrolled systems always evolve toward more stable states— that is, toward more uniform energy distribution (e.g., water flows downhill, objects hotter than their surrounding environment cool down). (HS-PS3-4)

DCI - ETS1.B - Engineering Design - Developing Possible Solutions

When evaluating solutions, it is important to take into account a range of constraints, including cost, safety , reliability , and aesthetics, and to consider social, cultural, and environmental impacts. (HS-ETS1-3)

DCI - ETS1.C - Engineering Design - Optimizing the Design Solution

Criteria may need to be broken down into simpler ones that can be approached systematically, and decisions about the priority of certain criteria over others (trade-offs) may be needed. (secondary to HS-PS1-6)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

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Science and Engineering Practice - Asking questions and defining problems

Define a design problem that involves the development of a process or system with interacting components and criteria and constraints that may include social, technical, and/or environmental considerations.

Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

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Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Design, evaluate, and/or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or

technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Crosscutting Concepts - Patterns

Different patterns may be observed at each of the scales at which a system is studied and can provide evidence for causality in explanations of phenomena.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Cause and effect relationships can be suggested and predicted for complex natural and human designed systems by examining what is known about smaller scale mechanisms within the system.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Changes in systems may have various causes that may not have equal effects.

Crosscutting Concepts - Scale, Proportion, and Quantity

Algebraic thinking is used to examine scientific data and predict the effect of a change in one variable on another (e.g., linear growth vs. exponential growth).

Crosscutting Concepts - Systems and System Models

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

Crosscutting Concepts - Systems and System Models

Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales.

Crosscutting Concepts - Systems and System Models

Models can be used to predict the behavior of a system, but these predictions have limited precision and reliability due to the assumptions and approximations inherent in models.

Crosscutting Concepts - Energy and Matter: Flows, Cycles, and Conservation

Tracking energy and matter flows, into, out of, and within systems helps one understand their system's behavior.

Crosscutting Concepts - Energy and Matter: Flows, Cycles, and Conservation

The total amount of energy and matter in closed systems is conserved.

Crosscutting Concepts - Energy and Matter: Flows, Cycles, and Conservation

Changes of energy and matter in a system can be described in terms of energy and matter flows into, out of, and within that system.

Crosscutting Concepts - Energy and Matter: Flows, Cycles, and Conservation

Energy cannot be created or destroyed—only moves between one place and another place, between objects and/or fields, or between systems.

Crosscutting Concepts - Energy and Matter: Flows, Cycles, and Conservation

Energy drives the cycling of matter within and between systems.

Crosscutting Concepts - Structure and Function

The way an object is shaped or structured determines many of its properties and functions.

Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Crosscutting Concepts - Stability and Change

Feedback (negative or positive) can stabilize or destabilize a system.

Principles of Biomedical Science (PBS)

Next Generation Science Standards

Lesson 3.1

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Planning and Carrying Out Investigations

Select appropriate tools to collect, record, analyze, and evaluate data. Make directional hypotheses that specify what happens to a dependent variable when an independent variable is manipulated.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Using Mathematics and Computational Thinking

Apply ratios, rates, percentages, and unit conversions in the context of complicated measurement problems involving quantities with derived or compound units (such as mg/mL, kg/m3 , acre-feet, etc.)

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

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Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Crosscutting Concepts - Stability and Change

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Principles of Biomedical Science (PBS)

Next Generation Science Standards

Lesson 3.2

HS.LS1.1 - From Molecules to Organisms: Structures and Processes

Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.LS3.1 - Heredity: Inheritance and Variation of Traits

Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

HS.LS3.2 - Heredity: Inheritance and Variation of Traits

Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.

HS.ETS1.4 - Engineering Design

Use a computer simulation to model the impact of proposed solutions to a complex real-world problem with numerous criteria and constraints on interactions within and between systems relevant to the problem.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells. (HS-LS1-1), (Note: This Disciplinary Core Idea is also addressed by HS-LS3-1.)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

DCI - LS1.C - From Molecules to Organisms: Structures and Processes - Organization for Matter and Energy Flow in Organisms

The sugar molecules thus formed contain carbon, hydrogen, and oxygen: their hydrocarbon backbones are used to make amino acids and other carbon-based molecules that can be assembled into larger molecules (such as proteins or DNA), used for example to form new cells. (HS-LS1-6)

DCI - LS3.A - Heredity: Inheritance and Variation of Traits - Inheritance of Traits

Each chromosome consists of a single very long DNA molecule, and each gene on the chromosome is a particular segment of that DNA. The instructions for forming species' characteristics are carried in DNA. All cells in an organism have the same genetic content, but the genes used (expressed) by the cell may be regulated in different ways. Not all DNA codes for a protein; some segments of DNA are involved in regulatory or structural functions, and some have no as-yet known function. (HS-LS3-1)

DCI - LS3.B - Heredity: Inheritance and Variation of Traits - Variation of Traits

In sexual reproduction, chromosomes can sometimes swap sections during the process of meiosis (cell division), thereby creating new genetic combinations and thus more genetic variation. Although DNA replication is tightly regulated and remarkably accurate, errors do occur and result in mutations, which are also a source of genetic variation. Environmental factors can also cause mutations in genes, and viable mutations are inherited. (HS-LS3-2)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

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- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Using Mathematics and Computational Thinking

Create and/or revise a computational model or simulation of a phenomenon, designed device, process, or system.

Science and Engineering Practice - Using Mathematics and Computational Thinking

Use mathematical, computational, and/or algorithmic representations of phenomena or design solutions to describe and/or support claims and/or explanations.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

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Crosscutting Concepts - Stability and Change

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Principles of Biomedical Science (PBS)

Next Generation Science Standards

Lesson 3.3

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.LS1.4 - From Molecules to Organisms: Structures and Processes

Use a model to illustrate the role of cellular division (mitosis) and differentiation in producing and maintaining complex organisms.

HS.LS3.1 - Heredity: Inheritance and Variation of Traits

Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

HS.LS3.2 - Heredity: Inheritance and Variation of Traits

Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.

HS.LS3.3 - Heredity: Inheritance and Variation of Traits

Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells. (HS-LS1-1), (Note: This Disciplinary Core Idea is also addressed by HS-LS3-1.)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

DCI - LS1.B - From Molecules to Organisms: Structures and Processes - Growth and Development of Organisms

In multicellular organisms individual cells grow and then divide via a process called mitosis, thereby allowing the organism to grow. The organism begins as a single cell (fertilized egg) that divides successively to produce many cells, with each parent cell passing identical genetic material (two variants of each chromosome pair) to both daughter cells. Cellular division and differentiation produce and maintain a complex organism, composed of systems of tissues and organs that work together to meet the needs of the whole organism. (HS-LS1-4)

DCI - LS3.A - Heredity: Inheritance and Variation of Traits - Inheritance of Traits

Each chromosome consists of a single very long DNA molecule, and each gene on the chromosome is a particular segment of that DNA. The instructions for forming species' characteristics are carried in DNA. All cells in an organism have the same genetic content, but the genes used (expressed) by the cell may be regulated in different ways. Not all DNA codes for a protein; some segments of DNA are involved in regulatory or structural functions, and some have no as-yet known function. (HS-LS3-1)

DCI - LS3.B - Heredity: Inheritance and Variation of Traits - Variation of Traits

In sexual reproduction, chromosomes can sometimes swap sections during the process of meiosis (cell division), thereby creating new genetic combinations and thus more genetic variation. Although DNA replication is tightly regulated and remarkably accurate, errors do occur and result in mutations, which are also a source of genetic variation. Environmental factors can also cause mutations in genes, and viable mutations are inherited. (HS-LS3-2)

Science and Engineering Practice - Asking questions and defining problems

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- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Developing and Using Models

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Science and Engineering Practice - Constructing Explanations and Designing Solutions

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models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

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Science and Engineering Practice - Constructing Explanations and Designing Solutions

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Crosscutting Concepts - Patterns

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Crosscutting Concepts - Stability and Change

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Principles of Biomedical Science (PBS)

Next Generation Science Standards

Lesson 3.4

HS.LS3.1 - Heredity: Inheritance and Variation of Traits

Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

HS.LS3.3 - Heredity: Inheritance and Variation of Traits

Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

HS.LS4.3 - Biological Evolution: Unity and Diversity

Apply concepts of statistics and probability to support explanations that organisms with an advantageous heritable trait tend to increase in proportion to organisms lacking this trait.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells. (HS-LS1-1), (Note: This Disciplinary Core Idea is also addressed by HS-LS3-1.)

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Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

DCI - LS4.B - Biological Evolution: Unity and Diversity - Natural Selection

Natural selection occurs only if there is both (1) variation in the genetic information between organisms in a population and (2) variation in the expression of that genetic information—that is, trait variation—that leads to differences in performance among individuals. (HS-LS4-2), (HS-LS4-3)

DCI - LS4.B - Biological Evolution: Unity and Diversity - Natural Selection

The traits that positively affect survival are more likely to be reproduced, and thus are more common in the population. (HS-LS4-3)

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Principles of Biomedical Science (PBS)

Next Generation Science Standards

Lesson 4.1

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

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DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

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Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Crosscutting Concepts - Patterns

Different patterns may be observed at each of the scales at which a system is studied and can provide evidence for causality in explanations of phenomena.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Cause and effect relationships can be suggested and predicted for complex natural and human designed systems by examining what is known about smaller scale mechanisms within the system.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Changes in systems may have various causes that may not have equal effects.

Crosscutting Concepts - Systems and System Models

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

Crosscutting Concepts - Systems and System Models

Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales.

Crosscutting Concepts - Systems and System Models

Models can be used to predict the behavior of a system, but these predictions have limited precision and reliability due to the assumptions and approximations inherent in models.

Crosscutting Concepts - Structure and Function

The way an object is shaped or structured determines many of its properties and functions.

Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Principles of Biomedical Science (PBS)

Next Generation Science Standards

Lesson 4.2

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Asking questions and defining problems

Evaluate a question to determine if it is testable and relevant.

Science and Engineering Practice - Asking questions and defining problems

Ask questions that can be investigated within the scope of the school laboratory, research facilities, or field (e.g., outdoor environment) with available resources and, when appropriate, frame a hypothesis based on a model or theory.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan an investigation or test a design individually and collaboratively to produce data to serve as the basis for evidence as part of building and revising models, supporting explanations for phenomena, or testing solutions to problems.

Consider possible confounding variables or effects and evaluate the investigation's design to ensure variables are controlled.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan and conduct an investigation or test a design solution in a safe and ethical manner including considerations of environmental, social, and personal impacts.

Science and Engineering Practice - Planning and Carrying Out Investigations

Select appropriate tools to collect, record, analyze, and evaluate data. Make directional hypotheses that specify what happens to a dependent variable when an independent variable is manipulated.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Make a quantitative and/or qualitative claim regarding the relationship between dependent and independent variables.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Crosscutting Concepts - Patterns

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Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Cause and effect relationships can be suggested and predicted for complex natural and human designed systems by examining what is known about smaller scale mechanisms within the system.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Changes in systems may have various causes that may not have equal effects.

Crosscutting Concepts - Scale, Proportion, and Quantity

Algebraic thinking is used to examine scientific data and predict the effect of a change in one variable on another (e.g., linear growth vs. exponential growth).

Crosscutting Concepts - Systems and System Models

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

Crosscutting Concepts - Structure and Function

The way an object is shaped or structured determines many of its properties and functions.

Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Principles of Biomedical Science (PBS)

Next Generation Science Standards

Lesson 4.3

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.ETS1.2 - Engineering Design

Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

DCI - ETS1.C - Engineering Design - Optimizing the Design Solution

Criteria may need to be broken down into simpler ones that can be approached systematically, and decisions about the priority of certain criteria over others (trade-offs) may be needed. (secondary to HS-PS1-6)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells. (HS-LS1-1), (Note: This Disciplinary Core Idea is also addressed by HS-LS3-1.)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Developing and Using Models

Design a test of a model to ascertain its reliability.

Science and Engineering Practice - Developing and Using Models

Develop a complex model that allows for manipulation and testing of a proposed process or system.

Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Planning and Carrying Out Investigations

Select appropriate tools to collect, record, analyze, and evaluate data. Make directional hypotheses that specify what happens to a dependent variable when an independent variable is manipulated.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Crosscutting Concepts - Patterns

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Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

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Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Changes in systems may have various causes that may not have equal effects.

Crosscutting Concepts - Systems and System Models

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

Crosscutting Concepts - Systems and System Models

Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales.

Crosscutting Concepts - Systems and System Models

Models can be used to predict the behavior of a system, but these predictions have limited precision and reliability due to the assumptions and approximations inherent in models.

Crosscutting Concepts - Structure and Function

The way an object is shaped or structured determines many of its properties and functions.

Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Crosscutting Concepts - Stability and Change

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Principles of Biomedical Science (PBS)

Next Generation Science Standards

Lesson 4.4

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

DCI - ETS1.B - Engineering Design - Developing Possible Solutions

When evaluating solutions, it is important to take into account a range of constraints, including cost, safety , reliability , and aesthetics, and to consider social, cultural, and environmental impacts. (HS-ETS1-3)

DCI - ETS1.C - Engineering Design - Optimizing the Design Solution

Criteria may need to be broken down into simpler ones that can be approached systematically, and decisions about the priority of certain criteria over others (trade-offs) may be needed. (secondary to HS-PS1-6)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Planning and Carrying Out Investigations

Select appropriate tools to collect, record, analyze, and evaluate data. Make directional hypotheses that specify what happens to a dependent variable when an independent variable is manipulated.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Design, evaluate, and/or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

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Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Crosscutting Concepts - Patterns

Different patterns may be observed at each of the scales at which a system is studied and can provide evidence for causality in explanations of phenomena.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Cause and effect relationships can be suggested and predicted for complex natural and human designed systems by examining what is known about smaller scale mechanisms within the system.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Changes in systems may have various causes that may not have equal effects.

Crosscutting Concepts - Systems and System Models

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

Crosscutting Concepts - Systems and System Models

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The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Crosscutting Concepts - Stability and Change

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Principles of Biomedical Science (PBS)

Next Generation Science Standards

Lesson 5.1

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

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Principles of Biomedical Science (PBS)

Next Generation Science Standards

Lesson 6.1

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

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Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

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Human Body Systems (HBS)

Common Core State Standards for English Language Arts

Lesson 1.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

AS.SL.5 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.5 - Language

Demonstrate understanding of word relationships and nuances in word meanings.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Human Body Systems (HBS)

Common Core State Standards for English Language Arts

Lesson 1.2

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.4 - Reading

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.5 - Language

Demonstrate understanding of word relationships and nuances in word meanings.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Human Body Systems (HBS)

Common Core State Standards for English Language Arts

Lesson 1.3

AS.R.4 - Reading

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.SL.6 - Speaking and Listening

Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.5 - Language

Demonstrate understanding of word relationships and nuances in word meanings.

Human Body Systems (HBS)

Common Core State Standards for English Language Arts

Lesson 2.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.4 - Reading

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.5 - Language

Demonstrate understanding of word relationships and nuances in word meanings.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Human Body Systems (HBS)

Common Core State Standards for English Language Arts

Lesson 2.2

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.4 - Reading

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.SL.6 - Speaking and Listening

Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.3 - Language

Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.5 - Language

Demonstrate understanding of word relationships and nuances in word meanings.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Human Body Systems (HBS)

Common Core State Standards for English Language Arts

Lesson 2.3

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Human Body Systems (HBS)

Common Core State Standards for English Language Arts

Lesson 2.4

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.3 - Writing

Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

Human Body Systems (HBS)

Common Core State Standards for English Language Arts

Lesson 3.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

Human Body Systems (HBS)

Common Core State Standards for English Language Arts

Lesson 3.2

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.5 - Language

Demonstrate understanding of word relationships and nuances in word meanings.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Human Body Systems (HBS)

Common Core State Standards for English Language Arts

Lesson 3.3

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.3 - Writing

Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

Human Body Systems (HBS)

Common Core State Standards for English Language Arts

Lesson 3.4

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.4 - Reading

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.8 - Reading

Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.5 - Language

Demonstrate understanding of word relationships and nuances in word meanings.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Human Body Systems (HBS)

Common Core State Standards for English Language Arts

Lesson 4.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

Human Body Systems (HBS)

Common Core State Standards for English Language Arts

Lesson 4.2

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.5 - Language

Demonstrate understanding of word relationships and nuances in word meanings.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the

college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Human Body Systems (HBS)

Common Core State Standards for English Language Arts

Lesson 4.3

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

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Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

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Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

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Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.5 - Language

Demonstrate understanding of word relationships and nuances in word meanings.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Human Body Systems (HBS)

Common Core State Standards for English Language Arts

Lesson 4.4

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.8 - Reading

Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.3 - Writing

Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

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Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

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Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.SL.6 - Speaking and Listening

Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.5 - Language

Demonstrate understanding of word relationships and nuances in word meanings.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Human Body Systems (HBS)

Common Core State Standards for English Language Arts

Lesson 5.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.3 - Writing

Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

Human Body Systems (HBS)

Common Core State Standards for English Language Arts

Lesson 5.2

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.5 - Language

Demonstrate understanding of word relationships and nuances in word meanings.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Human Body Systems (HBS)

Common Core State Standards for English Language Arts

Lesson 5.3

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.SL.6 - Speaking and Listening

Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

Human Body Systems (HBS)

Common Core State Standards for English Language Arts

Lesson 6.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.8 - Reading

Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.3 - Writing

Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.SL.6 - Speaking and Listening

Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

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Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.5 - Language

Demonstrate understanding of word relationships and nuances in word meanings.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Human Body Systems (HBS)

Common Core State Standards for Mathematics

Lesson 1.2

N.Q .1 - Quantities

Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N.Q .2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

N.Q .3 - Quantities

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

A.CED.2 - Creating Equations

Create equations in two or more variables to represent relationships between quantities; graph equations on coordinate axes with labels and scales.

A.CED.4 - Creating Equations

Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.

A.REI.3 - Reasoning with Equations and Inequalities

Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

A.REI.10 - Reasoning with Equations and Inequalities

Understand that the graph of an equation in two variables is the set of all its solutions plotted in the coordinate plane, often forming a curve (which could be a line).

F.IF.4 - Interpreting Functions

For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing,

positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

F.IF.7 - Interpreting Functions

Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

F.IF.7.a - Interpreting Functions

Graph linear and quadratic functions and show intercepts, maxima, and minima.

S.ID.1 - Interpreting Categorical and Quantitative Data

Represent data with plots on the real number line (dot plots, histograms, and box plots).

S.ID.6.a - Interpreting Categorical and Quantitative Data

Fit a function to the data; use functions fitted to data to solve problems in the context of the data. Use given functions or choose a function suggested by the context. Emphasize linear, quadratic, and exponential models.

S.ID.6.c - Interpreting Categorical and Quantitative Data

Fit a linear function for a scatter plot that suggests a linear association.

S.ID.7 - Interpreting Categorical and Quantitative Data

Interpret the slope (rate of change) and the intercept (constant term) of a linear model in the context of the data.

Human Body Systems (HBS)

Common Core State Standards for Mathematics

Lesson 1.3

N.Q .1 - Quantities

Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N.Q .2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

N.Q .3 - Quantities

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Human Body Systems (HBS)

Common Core State Standards for Mathematics

Lesson 2.2

N.Q .1 - Quantities

Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N.Q .2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

N.Q .3 - Quantities

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

F.IF.4 - Interpreting Functions

For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

S.ID.1 - Interpreting Categorical and Quantitative Data

Represent data with plots on the real number line (dot plots, histograms, and box plots).

S.ID.6 - Interpreting Categorical and Quantitative Data

Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

Human Body Systems (HBS)

Common Core State Standards for Mathematics

Lesson 2.3

S.ID.6 - Interpreting Categorical and Quantitative Data

Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

Human Body Systems (HBS)

Common Core State Standards for Mathematics

Lesson 2.4

N.Q .1 - Quantities

Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N.Q .2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

N.Q .3 - Quantities

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

S.ID.6 - Interpreting Categorical and Quantitative Data

Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

Human Body Systems (HBS)

Common Core State Standards for Mathematics

Lesson 3.2

N.Q .1 - Quantities

Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N.Q .2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

A.REI.1 - Reasoning with Equations and Inequalities

Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Human Body Systems (HBS)

Common Core State Standards for Mathematics

Lesson 3.3

N.Q .1 - Quantities

Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N.Q .2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

N.Q .3 - Quantities

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

A.SSE.1.a - Seeing Structure in Expressions

Interpret parts of an expression, such as terms, factors, and coefficients.

A.REI.1 - Reasoning with Equations and Inequalities

Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

F.IF.4 - Interpreting Functions

For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

F.IF.7 - Interpreting Functions

Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Human Body Systems (HBS)

Common Core State Standards for Mathematics

Lesson 3.4

N.Q .2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

N.Q .3 - Quantities

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Human Body Systems (HBS)

Common Core State Standards for Mathematics

Lesson 4.1

N.Q .2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

N.Q .3 - Quantities

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

G.MG.1 - Modeling with Geometry

Use geometric shapes, their measures, and their properties to describe objects (e.g., modeling a tree trunk or a human torso as a cylinder).

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Human Body Systems (HBS)

Common Core State Standards for Mathematics

Lesson 4.2

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Human Body Systems (HBS)

Common Core State Standards for Mathematics

Lesson 4.3

N.Q .1 - Quantities

Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

A.REI.1 - Reasoning with Equations and Inequalities

Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

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Evaluate reports based on data.

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Common Core State Standards for Mathematics

Lesson 4.4

N.Q .1 - Quantities

Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

F.IF.4 - Interpreting Functions

For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

F.IF.7 - Interpreting Functions

Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

S.ID.1 - Interpreting Categorical and Quantitative Data

Represent data with plots on the real number line (dot plots, histograms, and box plots).

S.ID.6 - Interpreting Categorical and Quantitative Data

Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

Human Body Systems (HBS)

Common Core State Standards for Mathematics

Lesson 5.2

S.ID.6 - Interpreting Categorical and Quantitative Data

Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

Human Body Systems (HBS)

Common Core State Standards for Mathematics

Lesson 5.3

N.Q .1 - Quantities

Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

F.IF.4 - Interpreting Functions

For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

F.IF.7 - Interpreting Functions

Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

S.ID.1 - Interpreting Categorical and Quantitative Data

Represent data with plots on the real number line (dot plots, histograms, and box plots).

S.ID.2 - Interpreting Categorical and Quantitative Data

Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.

S.ID.3 - Interpreting Categorical and Quantitative Data

Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

S.ID.6 - Interpreting Categorical and Quantitative Data

Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

Human Body Systems (HBS)

Common Core State Standards for Mathematics

Lesson 6.1

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Human Body Systems (HBS)

National Health Science

Lesson 1.1

1.11 Foundation Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Identify basic levels of organization of the human body

a. Chemical

b. Cellular

c. Tissue

d. Organs

e. Systems

f. Organism

1.12 Foundation Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Identify body planes, directional terms, cavities, and quadrants.

a. Body planes (sagittal, mid-sagittal, coronal/frontal, transverse/horizontal)

b. Directional terms (superior, inferior, anterior/ventral, posterior/dorsal, medial, lateral, proximal, distal, superficial, and deep)

c. Cavities (dorsal, cranial, spinal, thoracic, abdominal, and pelvic)

d. Quadrants (upper right, lower right, upper left, and lower left)

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.21 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Use common roots, prefixes, and suffixes to communicate information.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

Human Body Systems (HBS)

National Health Science

Lesson 1.2

1.31 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate competency in basic math skills and mathematical conversions as they relate to healthcare.

a. Metric system (such as: centi, milli, kilo)

b. Mathematical (average, ratios, fractions, percentages, addition, subtraction, multiplication, division)

c. Conversions (height, weight/mass, length, volume, temperature, household measurements)

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Identify the differences between subjective and objective information.

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Practice speaking and active listening skills.

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Modify communication to meet the needs of the patient/client and be appropriate to the situation.

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Evaluate roles and responsibilities of team members.

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Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

Human Body Systems (HBS)

National Health Science

Lesson 1.3

1.23 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe biomedical therapies as they relate to the prevention, pathology, and treatment of disease.

a. Gene testing

b. Gene therapy

c. Human proteomics

d. Cloning

e. Stem cell research

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

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Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

7.21 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Apply personal safety procedures based on Occupational Safety and Health Administration (OSHA) and Centers for Disease Control (CDC) regulations.

7.41 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Observe all safety standards related to the Occupational Exposure to Hazardous Chemicals Standard (Safety Data Sheets (SDSs)). (www.osha.gov)

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Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

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Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

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Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

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Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Human Body Systems (HBS)

National Health Science

Lesson 2.1

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

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Model verbal and nonverbal communication.

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Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

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b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

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g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

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Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

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Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Human Body Systems (HBS)

National Health Science

Lesson 2.2

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

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Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

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Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

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Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

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Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

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Evaluate validity of web-based resources.

Human Body Systems (HBS)

National Health Science

Lesson 2.3

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

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Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

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Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

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Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

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Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Human Body Systems (HBS)

National Health Science

Lesson 2.4

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.31 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate competency in basic math skills and mathematical conversions as they relate to healthcare.

a. Metric system (such as: centi, milli, kilo)

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c. Conversions (height, weight/mass, length, volume, temperature, household measurements)

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.12 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify common barriers to communication.

a. Physical disabilities (aphasia, hearing loss, impaired vision)

b. Psychological barriers (attitudes, bias, prejudice, stereotyping)

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

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Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

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Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

7.21 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Apply personal safety procedures based on Occupational Safety and Health Administration (OSHA) and Centers for Disease Control (CDC) regulations.

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Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

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Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

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Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Human Body Systems (HBS)

National Health Science

Lesson 3.1

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

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Prepare examples of technical, informative, and creative writing.

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Evaluate roles and responsibilities of team members.

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Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

9.11 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Promote behaviors of health and wellness (such as: nutrition, weight control, exercise, sleep habits).

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11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Human Body Systems (HBS)

National Health Science

Lesson 3.2

1.31 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate competency in basic math skills and mathematical conversions as they relate to healthcare.

a. Metric system (such as: centi, milli, kilo)

b. Mathematical (average, ratios, fractions, percentages, addition, subtraction, multiplication, division)

c. Conversions (height, weight/mass, length, volume, temperature, household measurements)

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

7.21 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Apply personal safety procedures based on Occupational Safety and Health Administration (OSHA) and Centers for Disease Control (CDC) regulations.

7.41 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Observe all safety standards related to the Occupational Exposure to Hazardous Chemicals Standard (Safety Data Sheets (SDSs)). (www.osha.gov)

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

9.11 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Promote behaviors of health and wellness (such as: nutrition, weight control, exercise, sleep habits).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Human Body Systems (HBS)

National Health Science

Lesson 3.3

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.31 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate competency in basic math skills and mathematical conversions as they relate to healthcare.

a. Metric system (such as: centi, milli, kilo)

b. Mathematical (average, ratios, fractions, percentages, addition, subtraction, multiplication, division)

c. Conversions (height, weight/mass, length, volume, temperature, household measurements)

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.22 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Interpret medical abbreviations to communicate information.

a. Common abbreviations

b. Joint Commission official "Do Not Use List"

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

4.41 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Develop components of a personal portfolio.

a. Letter of introduction

b. Resume

c. Sample Projects

d. Writing Sample

e. Work-based Learning Documentation

f. Oral Report

g. Service Learning/Community Service

h. Credentials

i. Technology Skills

j. Leadership Examples

7.21 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Apply personal safety procedures based on Occupational Safety and Health Administration (OSHA) and Centers for Disease Control (CDC) regulations.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Human Body Systems (HBS)

National Health Science

Lesson 3.4

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

7.21 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Apply personal safety procedures based on Occupational Safety and Health Administration (OSHA) and Centers for Disease Control (CDC) regulations.

7.41 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Observe all safety standards related to the Occupational Exposure to Hazardous Chemicals Standard (Safety Data Sheets (SDSs)). (www.osha.gov)

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

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Analyze attributes and attitudes of an effective leader.

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c. Roles (sets vision, leads change, manages accountability)

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Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Human Body Systems (HBS)

National Health Science

Lesson 4.1

1.31 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate competency in basic math skills and mathematical conversions as they relate to healthcare.

a. Metric system (such as: centi, milli, kilo)

b. Mathematical (average, ratios, fractions, percentages, addition, subtraction, multiplication, division)

c. Conversions (height, weight/mass, length, volume, temperature, household measurements)

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

7.21 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Apply personal safety procedures based on Occupational Safety and Health Administration (OSHA) and Centers for Disease Control (CDC) regulations.

7.22 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Demonstrate principles of body mechanics.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

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Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

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Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

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Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

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Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

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Evaluate validity of web-based resources.

Human Body Systems (HBS)

National Health Science

Lesson 4.2

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

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Practice speaking and active listening skills.

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Modify communication to meet the needs of the patient/client and be appropriate to the situation.

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Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

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Prepare examples of technical, informative, and creative writing.

7.21 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

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Demonstrate principles of body mechanics.

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Observe all safety standards related to the Occupational Exposure to Hazardous Chemicals Standard (Safety Data Sheets (SDSs)). (www.osha.gov)

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Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

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Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

9.11 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Promote behaviors of health and wellness (such as: nutrition, weight control, exercise, sleep habits).

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Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

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Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

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Demonstrate use of file organization and information storage.

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Identify uses of basic word processing, spreadsheet, and database applications.

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Evaluate validity of web-based resources.

Human Body Systems (HBS)

National Health Science

Lesson 4.3

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

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d. Treatment

e. Prevention

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c. Conversions (height, weight/mass, length, volume, temperature, household measurements)

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Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

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j. Value individual contributions

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Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

9.11 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Promote behaviors of health and wellness (such as: nutrition, weight control, exercise, sleep habits).

10.11 *Foundation Standard 10: Technical Skills: Apply technical skills required for all career specialties and demonstrate skills and knowledge as appropriate.

Apply procedures for measuring and recording vital signs including the normal ranges (temperature, pulse, respirations, blood pressure, pain).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Human Body Systems (HBS)

National Health Science

Lesson 4.4

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

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Model verbal and nonverbal communication.

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Identify the differences between subjective and objective information.

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Practice speaking and active listening skills.

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Modify communication to meet the needs of the patient/client and be appropriate to the situation.

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Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

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Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

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Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

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Promote behaviors of health and wellness (such as: nutrition, weight control, exercise, sleep habits).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Human Body Systems (HBS)

National Health Science

Lesson 5.1

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

10.11 *Foundation Standard 10: Technical Skills: Apply technical skills required for all career specialties and demonstrate skills and knowledge as appropriate.

Apply procedures for measuring and recording vital signs including the normal ranges (temperature, pulse, respirations, blood pressure, pain).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Human Body Systems (HBS)

National Health Science

Lesson 5.2

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Human Body Systems (HBS)

National Health Science

Lesson 5.3

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.31 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate competency in basic math skills and mathematical conversions as they relate to healthcare.

a. Metric system (such as: centi, milli, kilo)

b. Mathematical (average, ratios, fractions, percentages, addition, subtraction, multiplication, division)

c. Conversions (height, weight/mass, length, volume, temperature, household measurements)

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

7.21 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Apply personal safety procedures based on Occupational Safety and Health Administration (OSHA) and Centers for Disease Control (CDC) regulations.

7.41 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Observe all safety standards related to the Occupational Exposure to Hazardous Chemicals Standard (Safety Data Sheets (SDSs)). (www.osha.gov)

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

9.11 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Promote behaviors of health and wellness (such as: nutrition, weight control, exercise, sleep habits).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Human Body Systems (HBS)

National Health Science

Lesson 6.1

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Human Body Systems (HBS)

Next Generation Science Standards

Lesson 1.1

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Developing and Using Models

Develop, revise, and/or use a model based on evidence to illustrate and/or predict the relationships between systems or between components of a system.

Science and Engineering Practice - Developing and Using Models

Develop and/or use multiple types of models to provide mechanistic accounts and/or predict phenomena, and move flexibly between model types based on merits and limitations.

Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Engaging in Argument from Evidence

Evaluate the claims, evidence, and/or reasoning behind currently accepted explanations or solutions to determine the merits of arguments.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Crosscutting Concepts - Systems and System Models

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

Human Body Systems (HBS)

Next Generation Science Standards

Lesson 1.2

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Developing and Using Models

Develop, revise, and/or use a model based on evidence to illustrate and/or predict the relationships between systems or between components of a system.

Science and Engineering Practice - Developing and Using Models

Develop and/or use multiple types of models to provide mechanistic accounts and/or predict phenomena, and move flexibly between model types based on merits and limitations.

Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Planning and Carrying Out Investigations

Select appropriate tools to collect, record, analyze, and evaluate data. Make directional hypotheses that specify what happens to a dependent variable when an independent variable is manipulated.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Analyzing and Interpreting Data

Apply concepts of statistics and probability (including determining function fits to data, slope, intercept, and correlation coefficient for linear fits) to scientific and engineering questions and problems, using digital tools when feasible.

Science and Engineering Practice - Using Mathematics and Computational Thinking

Use mathematical, computational, and/or algorithmic representations of phenomena or design solutions to describe and/or support claims and/or explanations.

Science and Engineering Practice - Using Mathematics and Computational Thinking

Apply techniques of algebra and functions to represent and solve scientific and engineering problems.

Science and Engineering Practice - Using Mathematics and Computational Thinking

Apply ratios, rates, percentages, and unit conversions in the context of complicated measurement problems involving quantities with derived or compound units (such as mg/mL, kg/m3 , acre-feet, etc.)

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Engaging in Argument from Evidence

Evaluate the claims, evidence, and/or reasoning behind currently accepted explanations or solutions to determine the merits of arguments.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Crosscutting Concepts - Patterns

Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

Crosscutting Concepts - Patterns

Different patterns may be observed at each of the scales at which a system is studied and can provide evidence for causality in explanations of phenomena.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Cause and effect relationships can be suggested and predicted for complex natural and human designed systems by examining what is known about smaller scale mechanisms within the system.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Changes in systems may have various causes that may not have equal effects.

Crosscutting Concepts - Scale, Proportion, and Quantity

Algebraic thinking is used to examine scientific data and predict the effect of a change in one variable on another (e.g., linear growth vs. exponential growth).

Crosscutting Concepts - Systems and System Models

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

Crosscutting Concepts - Systems and System Models

Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales.

Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Crosscutting Concepts - Stability and Change

For both designed and natural systems, conditions that affect stability and factors that control rates of change are critical elements to consider and understand.

Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Human Body Systems (HBS)

Next Generation Science Standards

Lesson 1.3

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells. (HS-LS1-1), (Note: This Disciplinary Core Idea is also addressed by HS-LS3-1.)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

DCI - LS3.A - Heredity: Inheritance and Variation of Traits - Inheritance of Traits

Each chromosome consists of a single very long DNA molecule, and each gene on the chromosome is a particular segment of that DNA. The instructions for forming species' characteristics are carried in DNA. All cells in an organism have the same genetic content, but the genes used (expressed) by the cell may be regulated in different ways. Not all DNA codes for a protein; some segments of DNA are involved in regulatory or structural functions, and some have no as-yet known function. (HS-LS3-1)

DCI - LS3.B - Heredity: Inheritance and Variation of Traits - Variation of Traits

In sexual reproduction, chromosomes can sometimes swap sections during the process of meiosis (cell division), thereby creating new genetic combinations and thus more genetic variation. Although DNA replication is tightly regulated and remarkably accurate, errors do occur and result in mutations, which are also a source of genetic variation. Environmental factors can also cause mutations in genes, and viable mutations are inherited. (HS-LS3-2)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Engaging in Argument from Evidence

Evaluate the claims, evidence, and/or reasoning behind currently accepted explanations or solutions to determine the merits of arguments.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

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Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Crosscutting Concepts - Patterns

Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

Crosscutting Concepts - Patterns

Different patterns may be observed at each of the scales at which a system is studied and can provide evidence for causality in explanations of phenomena.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Cause and effect relationships can be suggested and predicted for complex natural and human designed systems by examining what is known about smaller scale mechanisms within the system.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Changes in systems may have various causes that may not have equal effects.

Crosscutting Concepts - Systems and System Models

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

Crosscutting Concepts - Systems and System Models

Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales.

Crosscutting Concepts - Stability and Change

For both designed and natural systems, conditions that affect stability and factors that control rates of change are critical elements to consider and understand.

Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Human Body Systems (HBS)

Next Generation Science Standards

Lesson 2.1

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Developing and Using Models

Develop, revise, and/or use a model based on evidence to illustrate and/or predict the relationships between systems or between components of a system.

Science and Engineering Practice - Developing and Using Models

Develop and/or use multiple types of models to provide mechanistic accounts and/or predict phenomena, and move flexibly between model types based on merits and limitations.

Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

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Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

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Human Body Systems (HBS)

Next Generation Science Standards

Lesson 2.2

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

DCI - PS3.A - Energy - Definitions of Energy

"Electrical energy" may mean energy stored in a battery or energy transmitted by electric currents. (secondary to HS-PS2-5)

DCI - PS3.A - Energy - Definitions of Energy

Energy is a quantitative property of a system that depends on the motion and interactions of matter and radiation within that system. That there is a single quantity called energy is due to the fact that a system's total energy is conserved, even as, within the system, energy is continually transferred from one object to another and between its various possible forms. (HSPS3-1), (HS-PS3-2)

DCI - PS3.A - Energy - Definitions of Energy

At the macroscopic scale, energy manifests itself in multiple ways, such as in motion, sound, light, and thermal energy . (HSPS3-2), (HS-PS3-3)

DCI - PS3.B - Energy - Conservation of Energy and Energy Transfer

Energy cannot be created or destroyed, but it can be transported from one place to another and transferred between systems. (HS-PS3-1), (HS-PS3-4)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

Science and Engineering Practice - Asking questions and defining problems

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Science and Engineering Practice - Asking questions and defining problems

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Science and Engineering Practice - Developing and Using Models

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Science and Engineering Practice - Developing and Using Models

Develop and/or use multiple types of models to provide mechanistic accounts and/or predict phenomena, and move flexibly between model types based on merits and limitations.

Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan an investigation or test a design individually and collaboratively to produce data to serve as the basis for evidence as part of building and revising models, supporting explanations for phenomena, or testing solutions to problems. Consider possible confounding variables or effects and evaluate the investigation's design to ensure variables are controlled.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan and conduct an investigation or test a design solution in a safe and ethical manner including considerations of environmental, social, and personal impacts.

Science and Engineering Practice - Planning and Carrying Out Investigations

Select appropriate tools to collect, record, analyze, and evaluate data. Make directional hypotheses that specify what happens to a dependent variable when an independent variable is manipulated.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Analyzing and Interpreting Data

Apply concepts of statistics and probability (including determining function fits to data, slope, intercept, and correlation coefficient for linear fits) to scientific and engineering questions and problems, using digital tools when feasible.

Science and Engineering Practice - Using Mathematics and Computational Thinking

Create and/or revise a computational model or simulation of a phenomenon, designed device, process, or system.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Make a quantitative and/or qualitative claim regarding the relationship between dependent and independent variables.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

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Science and Engineering Practice - Engaging in Argument from Evidence

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Crosscutting Concepts - Systems and System Models

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Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Crosscutting Concepts - Stability and Change

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Crosscutting Concepts - Stability and Change

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Human Body Systems (HBS)

Next Generation Science Standards

Lesson 2.3

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.LS1.3 - From Molecules to Organisms: Structures and Processes

Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system. (HS-LS1-3)

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Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Analyzing and Interpreting Data

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Science and Engineering Practice - Constructing Explanations and Designing Solutions

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Science and Engineering Practice - Engaging in Argument from Evidence

Evaluate the claims, evidence, and/or reasoning behind currently accepted explanations or solutions to determine the merits of arguments.

Science and Engineering Practice - Engaging in Argument from Evidence

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Science and Engineering Practice - Engaging in Argument from Evidence

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Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Crosscutting Concepts - Stability and Change

Feedback (negative or positive) can stabilize or destabilize a system.

Human Body Systems (HBS)

Next Generation Science Standards

Lesson 2.4

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

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Human Body Systems (HBS)

Next Generation Science Standards

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Human Body Systems (HBS)

Next Generation Science Standards

Lesson 3.2

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.LS1.7 - From Molecules to Organisms: Structures and Processes

Use a model to illustrate that cellular respiration is a chemical process whereby the bonds of food molecules and oxygen molecules are broken and the bonds in new compounds are formed resulting in a net transfer of energy.

DCI - PS3.A - Energy - Definitions of Energy

Energy is a quantitative property of a system that depends on the motion and interactions of matter and radiation within that system. That there is a single quantity called energy is due to the fact that a system's total energy is conserved, even as, within the system, energy is continually transferred from one object to another and between its various possible forms. (HSPS3-1), (HS-PS3-2)

DCI - PS3.B - Energy - Conservation of Energy and Energy Transfer

Conservation of energy means that the total change of energy in any system is always equal to the total energy transferred into or out of the system. (HS-PS3-1)

DCI - PS3.B - Energy - Conservation of Energy and Energy Transfer

Energy cannot be created or destroyed, but it can be transported from one place to another and transferred between systems. (HS-PS3-1),(HS-PS3-4)

DCI - PS3.B - Energy - Conservation of Energy and Energy Transfer

The availability of energy limits that can occur in any system. (HS-PS3-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system. (HS-LS1-3)

DCI - LS1.C - From Molecules to Organisms: Structures and Processes - Organization for Matter and Energy Flow in Organisms

The sugar molecules thus formed contain carbon, hydrogen, and oxygen: their hydrocarbon backbones are used to make amino acids and other carbon-based molecules that can be assembled into larger molecules (such as proteins or DNA), used for example to form new cells. (HS-LS1-6)

DCI - LS1.C - From Molecules to Organisms: Structures and Processes - Organization for Matter and Energy Flow in Organisms

As matter and energy flow through different organizational levels of living systems, chemical elements are recombined in different ways to form different products. (HS-LS1-6), (HS-LS1-7)

DCI - LS1.C - From Molecules to Organisms: Structures and Processes - Organization for Matter and Energy Flow in Organisms

As a result of these chemical reactions, energy is transferred from one system of interacting molecules to another. Cellular respiration is a chemical process in which the bonds of food molecules and oxygen molecules are broken and new compounds are formed that can transport energy to muscles. Cellular respiration also releases the energy needed to maintain body temperature despite ongoing energy transfer to the surrounding environment. (HS-LS1-7)

DCI - LS2.B - Ecosystems: Interactions, Energy, and Dynamics - Cycles of Matter and Energy Transfer in Ecosystems

Photosynthesis and cellular respiration (including anaerobic processes) provide most of the energy for life processes. (HS-LS2-3)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Asking questions and defining problems

Evaluate a question to determine if it is testable and relevant.

Science and Engineering Practice - Asking questions and defining problems

Ask questions that can be investigated within the scope of the school laboratory, research facilities, or field (e.g., outdoor environment) with available resources and, when appropriate, frame a hypothesis based on a model or theory.

Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Developing and Using Models

Develop, revise, and/or use a model based on evidence to illustrate and/or predict the relationships between systems or between components of a system.

Science and Engineering Practice - Developing and Using Models

Develop and/or use multiple types of models to provide mechanistic accounts and/or predict phenomena, and move flexibly between model types based on merits and limitations.

Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan an investigation or test a design individually and collaboratively to produce data to serve as the basis for evidence as part of building and revising models, supporting explanations for phenomena, or testing solutions to problems. Consider possible confounding variables or effects and evaluate the investigation's design to ensure variables are controlled.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan and conduct an investigation or test a design solution in a safe and ethical manner including considerations of environmental, social, and personal impacts.

Science and Engineering Practice - Planning and Carrying Out Investigations

Select appropriate tools to collect, record, analyze, and evaluate data. Make directional hypotheses that specify what happens to a dependent variable when an independent variable is manipulated.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Analyzing and Interpreting Data

Apply concepts of statistics and probability (including determining function fits to data, slope, intercept, and correlation coefficient for linear fits) to scientific and engineering questions and problems, using digital tools when feasible.

Science and Engineering Practice - Using Mathematics and Computational Thinking

Create and/or revise a computational model or simulation of a phenomenon, designed device, process, or system.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Make a quantitative and/or qualitative claim regarding the relationship between dependent and independent variables.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Engaging in Argument from Evidence

Evaluate the claims, evidence, and/or reasoning behind currently accepted explanations or solutions to determine the merits of arguments.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Crosscutting Concepts - Patterns

Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

Crosscutting Concepts - Patterns

Different patterns may be observed at each of the scales at which a system is studied and can provide evidence for causality in explanations of phenomena.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Cause and effect relationships can be suggested and predicted for complex natural and human designed systems by examining what is known about smaller scale mechanisms within the system.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Changes in systems may have various causes that may not have equal effects.

Crosscutting Concepts - Scale, Proportion, and Quantity

Algebraic thinking is used to examine scientific data and predict the effect of a change in one variable on another (e.g., linear growth vs. exponential growth).

Crosscutting Concepts - Systems and System Models

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

Crosscutting Concepts - Systems and System Models

Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales.

Crosscutting Concepts - Energy and Matter: Flows, Cycles, and Conservation

Tracking energy and matter flows, into, out of, and within systems helps one understand their system's behavior.

Crosscutting Concepts - Energy and Matter: Flows, Cycles, and Conservation

The total amount of energy and matter in closed systems is conserved.

Crosscutting Concepts - Energy and Matter: Flows, Cycles, and Conservation

Changes of energy and matter in a system can be described in terms of energy and matter flows into, out of, and within that system.

Crosscutting Concepts - Energy and Matter: Flows, Cycles, and Conservation

Energy cannot be created or destroyed—only moves between one place and another place, between objects and/or fields, or between systems.

Crosscutting Concepts - Energy and Matter: Flows, Cycles, and Conservation

Energy drives the cycling of matter within and between systems.

Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Human Body Systems (HBS)

Next Generation Science Standards

Lesson 3.3

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Developing and Using Models

Develop, revise, and/or use a model based on evidence to illustrate and/or predict the relationships between systems or between components of a system.

Science and Engineering Practice - Developing and Using Models

Develop and/or use multiple types of models to provide mechanistic accounts and/or predict phenomena, and move flexibly between model types based on merits and limitations.

Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Planning and Carrying Out Investigations

Select appropriate tools to collect, record, analyze, and evaluate data. Make directional hypotheses that specify what happens to a dependent variable when an independent variable is manipulated.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Analyzing and Interpreting Data

Apply concepts of statistics and probability (including determining function fits to data, slope, intercept, and correlation coefficient for linear fits) to scientific and engineering questions and problems, using digital tools when feasible.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

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Crosscutting Concepts - Patterns

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Crosscutting Concepts - Patterns

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Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Changes in systems may have various causes that may not have equal effects.

Crosscutting Concepts - Systems and System Models

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

Crosscutting Concepts - Systems and System Models

Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales.

Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Crosscutting Concepts - Stability and Change

For both designed and natural systems, conditions that affect stability and factors that control rates of change are critical elements to consider and understand.

Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Human Body Systems (HBS)

Next Generation Science Standards

Lesson 3.4

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.LS1.3 - From Molecules to Organisms: Structures and Processes

Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system. (HS-LS1-3)

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Science and Engineering Practice - Developing and Using Models

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Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Analyzing and Interpreting Data

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Science and Engineering Practice - Engaging in Argument from Evidence

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Crosscutting Concepts - Patterns

Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

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Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

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Crosscutting Concepts - Stability and Change

For both designed and natural systems, conditions that affect stability and factors that control rates of change are critical elements to consider and understand.

Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Crosscutting Concepts - Stability and Change

Feedback (negative or positive) can stabilize or destabilize a system.

Human Body Systems (HBS)

Next Generation Science Standards

Lesson 4.1

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

Science and Engineering Practice - Asking questions and defining problems

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Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

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Science and Engineering Practice - Engaging in Argument from Evidence

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Science and Engineering Practice - Engaging in Argument from Evidence

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Human Body Systems (HBS)

Next Generation Science Standards

Lesson 4.2

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

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Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

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Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

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Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Crosscutting Concepts - Patterns

Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

Crosscutting Concepts - Patterns

Different patterns may be observed at each of the scales at which a system is studied and can provide evidence for causality in explanations of phenomena.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Cause and effect relationships can be suggested and predicted for complex natural and human designed systems by examining what is known about smaller scale mechanisms within the system.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Changes in systems may have various causes that may not have equal effects.

Crosscutting Concepts - Systems and System Models

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

Crosscutting Concepts - Systems and System Models

Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales.

Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Crosscutting Concepts - Stability and Change

For both designed and natural systems, conditions that affect stability and factors that control rates of change are critical elements to consider and understand.

Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Human Body Systems (HBS)

Next Generation Science Standards

Lesson 4.3

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Developing and Using Models

Develop, revise, and/or use a model based on evidence to illustrate and/or predict the relationships between systems or between components of a system.

Science and Engineering Practice - Developing and Using Models

Develop and/or use multiple types of models to provide mechanistic accounts and/or predict phenomena, and move flexibly between model types based on merits and limitations.

Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Planning and Carrying Out Investigations

Select appropriate tools to collect, record, analyze, and evaluate data. Make directional hypotheses that specify what happens to a dependent variable when an independent variable is manipulated.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Analyzing and Interpreting Data

Apply concepts of statistics and probability (including determining function fits to data, slope, intercept, and correlation coefficient for linear fits) to scientific and engineering questions and problems, using digital tools when feasible.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Engaging in Argument from Evidence

Evaluate the claims, evidence, and/or reasoning behind currently accepted explanations or solutions to determine the merits of arguments.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

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Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

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Crosscutting Concepts - Patterns

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Crosscutting Concepts - Patterns

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Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

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Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

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Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Crosscutting Concepts - Stability and Change

For both designed and natural systems, conditions that affect stability and factors that control rates of change are critical elements to consider and understand.

Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Human Body Systems (HBS)

Next Generation Science Standards

Lesson 4.4

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.LS1.3 - From Molecules to Organisms: Structures and Processes

Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

HS.ETS1.2 - Engineering Design

Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

HS.ETS1.3 - Engineering Design

Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

DCI - ETS1.C - Engineering Design - Optimizing the Design Solution

Criteria may need to be broken down into simpler ones that can be approached systematically, and decisions about the priority of certain criteria over others (trade-offs) may be needed. (secondary to HS-PS1-6)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Asking questions and defining problems

Evaluate a question to determine if it is testable and relevant.

Science and Engineering Practice - Asking questions and defining problems

Ask questions that can be investigated within the scope of the school laboratory, research facilities, or field (e.g., outdoor environment) with available resources and, when appropriate, frame a hypothesis based on a model or theory.

Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan an investigation or test a design individually and collaboratively to produce data to serve as the basis for evidence as part of building and revising models, supporting explanations for phenomena, or testing solutions to problems. Consider possible confounding variables or effects and evaluate the investigation's design to ensure variables are controlled.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan and conduct an investigation or test a design solution in a safe and ethical manner including considerations of environmental, social, and personal impacts.

Science and Engineering Practice - Planning and Carrying Out Investigations

Select appropriate tools to collect, record, analyze, and evaluate data. Make directional hypotheses that specify what happens to a dependent variable when an independent variable is manipulated.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Analyzing and Interpreting Data

Apply concepts of statistics and probability (including determining function fits to data, slope, intercept, and correlation coefficient for linear fits) to scientific and engineering questions and problems, using digital tools when feasible.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Make a quantitative and/or qualitative claim regarding the relationship between dependent and independent variables.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Design, evaluate, and/or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

Science and Engineering Practice - Engaging in Argument from Evidence

Evaluate the claims, evidence, and/or reasoning behind currently accepted explanations or solutions to determine the merits of arguments.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Crosscutting Concepts - Patterns

Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

Crosscutting Concepts - Patterns

Different patterns may be observed at each of the scales at which a system is studied and can provide evidence for causality in explanations of phenomena.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Cause and effect relationships can be suggested and predicted for complex natural and human designed systems by examining what is known about smaller scale mechanisms within the system.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Changes in systems may have various causes that may not have equal effects.

Crosscutting Concepts - Systems and System Models

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

Crosscutting Concepts - Systems and System Models

Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales.

Crosscutting Concepts - Stability and Change

For both designed and natural systems, conditions that affect stability and factors that control rates of change are critical elements to consider and understand.

Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Human Body Systems (HBS)

Next Generation Science Standards

Lesson 5.1

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

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Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Developing and Using Models

Develop, revise, and/or use a model based on evidence to illustrate and/or predict the relationships between systems or between components of a system.

Science and Engineering Practice - Developing and Using Models

Develop and/or use multiple types of models to provide mechanistic accounts and/or predict phenomena, and move flexibly between model types based on merits and limitations.

Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Using Mathematics and Computational Thinking

Create and/or revise a computational model or simulation of a phenomenon, designed device, process, or system.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Engaging in Argument from Evidence

Evaluate the claims, evidence, and/or reasoning behind currently accepted explanations or solutions to determine the merits of arguments.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

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Crosscutting Concepts - Patterns

Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

Crosscutting Concepts - Patterns

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Crosscutting Concepts - Systems and System Models

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Crosscutting Concepts - Systems and System Models

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The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Crosscutting Concepts - Stability and Change

For both designed and natural systems, conditions that affect stability and factors that control rates of change are critical elements to consider and understand.

Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Human Body Systems (HBS)

Next Generation Science Standards

Lesson 5.2

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.LS1.3 - From Molecules to Organisms: Structures and Processes

Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system. (HS-LS1-3)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Developing and Using Models

Develop, revise, and/or use a model based on evidence to illustrate and/or predict the relationships between systems or between components of a system.

Science and Engineering Practice - Developing and Using Models

Develop and/or use multiple types of models to provide mechanistic accounts and/or predict phenomena, and move flexibly between model types based on merits and limitations.

Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Engaging in Argument from Evidence

Evaluate the claims, evidence, and/or reasoning behind currently accepted explanations or solutions to determine the merits of arguments.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

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Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Crosscutting Concepts - Stability and Change

Feedback (negative or positive) can stabilize or destabilize a system.

Human Body Systems (HBS)

Next Generation Science Standards

Lesson 5.3

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.LS3.1 - Heredity: Inheritance and Variation of Traits

Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells. (HS-LS1-1), (Note: This Disciplinary Core Idea is also addressed by HS-LS3-1.)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

DCI - LS3.A - Heredity: Inheritance and Variation of Traits - Inheritance of Traits

Each chromosome consists of a single very long DNA molecule, and each gene on the chromosome is a particular segment of that DNA. The instructions for forming species' characteristics are carried in DNA. All cells in an organism have the same genetic content, but the genes used (expressed) by the cell may be regulated in different ways. Not all DNA codes for a protein; some segments of DNA are involved in regulatory or structural functions, and some have no as-yet known function. (HS-LS3-1)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Developing and Using Models

Develop, revise, and/or use a model based on evidence to illustrate and/or predict the relationships between systems or between components of a system.

Science and Engineering Practice - Developing and Using Models

Develop and/or use multiple types of models to provide mechanistic accounts and/or predict phenomena, and move flexibly between model types based on merits and limitations.

Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Engaging in Argument from Evidence

Evaluate the claims, evidence, and/or reasoning behind currently accepted explanations or solutions to determine the merits of arguments.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Crosscutting Concepts - Patterns

Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

Crosscutting Concepts - Patterns

Different patterns may be observed at each of the scales at which a system is studied and can provide evidence for causality in explanations of phenomena.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Cause and effect relationships can be suggested and predicted for complex natural and human designed systems by examining what is known about smaller scale mechanisms within the system.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Changes in systems may have various causes that may not have equal effects.

Crosscutting Concepts - Systems and System Models

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

Crosscutting Concepts - Systems and System Models

Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales.

Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Crosscutting Concepts - Stability and Change

For both designed and natural systems, conditions that affect stability and factors that control rates of change are critical elements to consider and understand.

Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Human Body Systems (HBS)

Next Generation Science Standards

Lesson 6.1

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.LS1.3 - From Molecules to Organisms: Structures and Processes

Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

HS.ETS1.2 - Engineering Design

Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

HS.ETS1.3 - Engineering Design

Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Developing and Using Models

Develop, revise, and/or use a model based on evidence to illustrate and/or predict the relationships between systems or between components of a system.

Science and Engineering Practice - Developing and Using Models

Develop and/or use multiple types of models to provide mechanistic accounts and/or predict phenomena, and move flexibly between model types based on merits and limitations.

Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Using Mathematics and Computational Thinking

Create and/or revise a computational model or simulation of a phenomenon, designed device, process, or system.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Engaging in Argument from Evidence

Evaluate the claims, evidence, and/or reasoning behind currently accepted explanations or solutions to determine the merits of arguments.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

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Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Medical Interventions (MI)

Common Core State Standards for English Language Arts

Lesson 1.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.3 - Writing

Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

Medical Interventions (MI)

Common Core State Standards for English Language Arts

Lesson 1.2

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

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Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

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AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

Medical Interventions (MI)

Common Core State Standards for English Language Arts

Lesson 1.3

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.9 - Reading

Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.6 - Speaking and Listening

Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

Medical Interventions (MI)

Common Core State Standards for English Language Arts

Lesson 1.4

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.8 - Reading

Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.3 - Writing

Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.5 - Language

Demonstrate understanding of word relationships and nuances in word meanings.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Medical Interventions (MI)

Common Core State Standards for English Language Arts

Lesson 2.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.8 - Reading

Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.3 - Writing

Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

Medical Interventions (MI)

Common Core State Standards for English Language Arts

Lesson 2.2

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.8 - Reading

Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

AS.R.9 - Reading

Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.3 - Writing

Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.3 - Speaking and Listening

Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.6 - Speaking and Listening

Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

Medical Interventions (MI)

Common Core State Standards for English Language Arts

Lesson 3.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.3 - Writing

Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

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Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

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Demonstrate understanding of word relationships and nuances in word meanings.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Medical Interventions (MI)

Common Core State Standards for English Language Arts

Lesson 3.2

AS.R.1 - Reading

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AS.R.2 - Reading

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AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

Medical Interventions (MI)

Common Core State Standards for English Language Arts

Lesson 3.3

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.8 - Reading

Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

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Read and comprehend complex literary and informational texts independently and proficiently.

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Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering

vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Medical Interventions (MI)

Common Core State Standards for English Language Arts

Lesson 3.4

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.8 - Reading

Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

AS.R.9 - Reading

Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.3 - Writing

Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Medical Interventions (MI)

Common Core State Standards for English Language Arts

Lesson 4.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

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AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

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AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

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Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

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Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Medical Interventions (MI)

Common Core State Standards for English Language Arts

Lesson 4.2

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

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Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

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Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

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Medical Interventions (MI)

Common Core State Standards for English Language Arts

Lesson 4.3

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.9 - Reading

Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

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Read and comprehend complex literary and informational texts independently and proficiently.

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Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

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AS.W.3 - Writing

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AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

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Medical Interventions (MI)

Common Core State Standards for English Language Arts

Lesson 4.4

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.6 - Reading

Assess how point of view or purpose shapes the content and style of a text.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.8 - Reading

Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

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Read and comprehend complex literary and informational texts independently and proficiently.

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Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

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Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

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Medical Interventions (MI)

Common Core State Standards for Mathematics

Lesson 1.1

N.Q .2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

N.Q .3 - Quantities

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

A.CED.1 - Creating Equations

Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear and quadratic functions, and simple rational and exponential functions.

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Medical Interventions (MI)

Common Core State Standards for Mathematics

Lesson 1.2

N.Q .2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

S.ID.1 - Interpreting Categorical and Quantitative Data

Represent data with plots on the real number line (dot plots, histograms, and box plots).

S.ID.6.c - Interpreting Categorical and Quantitative Data

Fit a linear function for a scatter plot that suggests a linear association.

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Medical Interventions (MI)

Common Core State Standards for Mathematics

Lesson 1.3

N.Q .2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

N.Q .3 - Quantities

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

S.ID.6 - Interpreting Categorical and Quantitative Data

Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Medical Interventions (MI)

Common Core State Standards for Mathematics

Lesson 1.4

N.Q .2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

A.REI.3 - Reasoning with Equations and Inequalities

Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Medical Interventions (MI)

Common Core State Standards for Mathematics

Lesson 2.1

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

S.MD.5 - Using Probability to Make Decisions

(+) Weigh the possible outcomes of a decision by assigning probabilities to payoff values and finding expected values.

S.MD.5.a - Using Probability to Make Decisions

Find the expected payoff for a game of chance. For example, find the expected winnings from a state lottery ticket or a game at a fast- food restaurant.

S.MD.5.b - Using Probability to Make Decisions

Evaluate and compare strategies on the basis of expected values. For example, compare a high-deductible versus a low-deductible automobile insurance policy using various, but reasonable, chances of having a minor or a major accident.

Medical Interventions (MI)

Common Core State Standards for Mathematics

Lesson 3.1

N.Q .1 - Quantities

Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N.Q .2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

N.Q .3 - Quantities

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

S.ID.2 - Interpreting Categorical and Quantitative Data

Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.

S.ID.6 - Interpreting Categorical and Quantitative Data

Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

S.ID.9 - Interpreting Categorical and Quantitative Data

Distinguish between correlation and causation.

S.IC.1 - Making Inferences and Justifying Conclusions

Understand statistics as a process for making inferences about population parameters based on a random sample from that population.

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Medical Interventions (MI)

Common Core State Standards for Mathematics

Lesson 3.2

N.Q .1 - Quantities

Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N.Q .2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

N.Q .3 - Quantities

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

A.REI.3 - Reasoning with Equations and Inequalities

Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

S.ID.6 - Interpreting Categorical and Quantitative Data

Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Medical Interventions (MI)

Common Core State Standards for Mathematics

Lesson 3.3

N.Q .1 - Quantities

Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N.Q .2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

F.IF.7 - Interpreting Functions

Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Medical Interventions (MI)

Common Core State Standards for Mathematics

Lesson 3.4

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Medical Interventions (MI)

Common Core State Standards for Mathematics

Lesson 4.1

N.Q .1 - Quantities

Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N.Q .2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

A.REI.1 - Reasoning with Equations and Inequalities

Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

A.REI.3 - Reasoning with Equations and Inequalities

Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Medical Interventions (MI)

Common Core State Standards for Mathematics

Lesson 4.2

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Medical Interventions (MI)

Common Core State Standards for Mathematics

Lesson 4.3

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Medical Interventions (MI)

National Health Science

Lesson 1.1

1.11 Foundation Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Identify basic levels of organization of the human body

a. Chemical

b. Cellular

c. Tissue

d. Organs

e. Systems

f. Organism

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.23 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe biomedical therapies as they relate to the prevention, pathology, and treatment of disease.

a. Gene testing

b. Gene therapy

c. Human proteomics

d. Cloning

e. Stem cell research

1.31 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate competency in basic math skills and mathematical conversions as they relate to healthcare.

a. Metric system (such as: centi, milli, kilo)

b. Mathematical (average, ratios, fractions, percentages, addition, subtraction, multiplication, division)

c. Conversions (height, weight/mass, length, volume, temperature, household measurements)

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

4.21 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Apply employability skills in healthcare.

a. Chain of command

b. Correct grammar

c. Decision making

d. Flexible

e. Initiative

f. Integrity

g. Loyalty

h. Positive attitude

i. Professional characteristics

j. Prompt and prepared

k. Responsibility

l. Scope of practice

m. Teamwork

n. Willing to learn

7.11 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Explain principles of infection control.

a. Chain of infection

b. Mode of transmission (direct, indirect, vectors, common vehicle [air, food, water], healthcare-associated infections [nosocomial], opportunistic)

c. Microorganisms (non-pathogenic, pathogenic, aerobic, anaerobic)

d. Classifications (bacteria, protozoa, fungi, viruses, parasites)

7.12 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Differentiate methods of controlling the spread and growth of microorganisms.

a. Aseptic control (antisepsis, disinfection, sterilization, sterile technique)

b. Standard precautions

c. Isolation precautions

d. Blood borne pathogen precautions

e. Vaccinations

7.41 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Observe all safety standards related to the Occupational Exposure to Hazardous Chemicals Standard (Safety Data Sheets (SDSs)). (www.osha.gov)

7.42 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Comply with safety signs, symbols, and labels.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Medical Interventions (MI)

National Health Science

Lesson 1.2

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.12 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify common barriers to communication.

a. Physical disabilities (aphasia, hearing loss, impaired vision)

b. Psychological barriers (attitudes, bias, prejudice, stereotyping)

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

4.21 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Apply employability skills in healthcare.

a. Chain of command

b. Correct grammar

c. Decision making

d. Flexible

e. Initiative

f. Integrity

g. Loyalty

h. Positive attitude

i. Professional characteristics

j. Prompt and prepared

k. Responsibility

l. Scope of practice

m. Teamwork

n. Willing to learn

6.11 Foundation Standard 6: Ethics: Understand accepted ethical practices with respect to cultural, social, and ethnic differences within the healthcare environment.

Differentiate between ethical and legal issues impacting healthcare.

7.11 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Explain principles of infection control.

a. Chain of infection

b. Mode of transmission (direct, indirect, vectors, common vehicle [air, food, water], healthcare-associated infections [nosocomial], opportunistic)

c. Microorganisms (non-pathogenic, pathogenic, aerobic, anaerobic)

d. Classifications (bacteria, protozoa, fungi, viruses, parasites)

7.12 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Differentiate methods of controlling the spread and growth of microorganisms.

a. Aseptic control (antisepsis, disinfection, sterilization, sterile technique)

b. Standard precautions

c. Isolation precautions

d. Blood borne pathogen precautions

e. Vaccinations

7.41 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Observe all safety standards related to the Occupational Exposure to Hazardous Chemicals Standard (Safety Data Sheets (SDSs)). (www.osha.gov)

7.42 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Comply with safety signs, symbols, and labels.

7.51 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Practice fire safety in a healthcare setting.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

9.11 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Promote behaviors of health and wellness (such as: nutrition, weight control, exercise, sleep habits).

9.12 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Describe strategies for prevention of disease.

a. Routine physical exams

b. Medical, dental, and mental health screenings

c. Community health education outreach programs

d. Immunizations

e. Stress management

f. Avoid risky behaviors

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Medical Interventions (MI)

National Health Science

Lesson 1.3

1.11 Foundation Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Identify basic levels of organization of the human body

a. Chemical

b. Cellular

c. Tissue

d. Organs

e. Systems

f. Organism

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.31 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate competency in basic math skills and mathematical conversions as they relate to healthcare.

a. Metric system (such as: centi, milli, kilo)

b. Mathematical (average, ratios, fractions, percentages, addition, subtraction, multiplication, division)

c. Conversions (height, weight/mass, length, volume, temperature, household measurements)

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

4.21 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Apply employability skills in healthcare.

a. Chain of command

b. Correct grammar

c. Decision making

d. Flexible

e. Initiative

f. Integrity

g. Loyalty

h. Positive attitude

i. Professional characteristics

j. Prompt and prepared

k. Responsibility

l. Scope of practice

m. Teamwork

n. Willing to learn

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

4.32 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Distinguish differences among careers within health science pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).

6.11 Foundation Standard 6: Ethics: Understand accepted ethical practices with respect to cultural, social, and ethnic differences within the healthcare environment.

Differentiate between ethical and legal issues impacting healthcare.

6.21 Foundation Standard 6: Ethics: Understand accepted ethical practices with respect to cultural, social, and ethnic differences within the healthcare environment.

Discuss religious and cultural values as they impact healthcare (such as: ethnicity, race, religion, gender).

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Medical Interventions (MI)

National Health Science

Lesson 1.4

1.11 Foundation Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Identify basic levels of organization of the human body

a. Chemical

b. Cellular

c. Tissue

d. Organs

e. Systems

f. Organism

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.22 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Discuss research related to emerging diseases and disorders (such as: autism, VRSA, PTSD, Listeria, seasonal flu).

1.23 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe biomedical therapies as they relate to the prevention, pathology, and treatment of disease.

a. Gene testing

b. Gene therapy

c. Human proteomics

d. Cloning

e. Stem cell research

1.31 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate competency in basic math skills and mathematical conversions as they relate to healthcare.

a. Metric system (such as: centi, milli, kilo)

b. Mathematical (average, ratios, fractions, percentages, addition, subtraction, multiplication, division)

c. Conversions (height, weight/mass, length, volume, temperature, household measurements)

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

4.21 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Apply employability skills in healthcare.

a. Chain of command

b. Correct grammar

c. Decision making

d. Flexible

e. Initiative

f. Integrity

g. Loyalty

h. Positive attitude

i. Professional characteristics

j. Prompt and prepared

k. Responsibility

l. Scope of practice

m. Teamwork

n. Willing to learn

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

4.32 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Distinguish differences among careers within health science pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).

7.11 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Explain principles of infection control.

a. Chain of infection

b. Mode of transmission (direct, indirect, vectors, common vehicle [air, food, water], healthcare-associated infections [nosocomial], opportunistic)

c. Microorganisms (non-pathogenic, pathogenic, aerobic, anaerobic)

d. Classifications (bacteria, protozoa, fungi, viruses, parasites)

7.12 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Differentiate methods of controlling the spread and growth of microorganisms.

a. Aseptic control (antisepsis, disinfection, sterilization, sterile technique)

b. Standard precautions

c. Isolation precautions

d. Blood borne pathogen precautions

e. Vaccinations

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

9.11 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Promote behaviors of health and wellness (such as: nutrition, weight control, exercise, sleep habits).

9.12 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Describe strategies for prevention of disease.

a. Routine physical exams

b. Medical, dental, and mental health screenings

c. Community health education outreach programs

d. Immunizations

e. Stress management

f. Avoid risky behaviors

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Medical Interventions (MI)

National Health Science

Lesson 2.1

1.11 Foundation Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Identify basic levels of organization of the human body

a. Chemical

b. Cellular

c. Tissue

d. Organs

e. Systems

f. Organism

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.23 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe biomedical therapies as they relate to the prevention, pathology, and treatment of disease.

a. Gene testing

b. Gene therapy

c. Human proteomics

d. Cloning

e. Stem cell research

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

4.21 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Apply employability skills in healthcare.

a. Chain of command

b. Correct grammar

c. Decision making

d. Flexible

e. Initiative

f. Integrity

g. Loyalty

h. Positive attitude

i. Professional characteristics

j. Prompt and prepared

k. Responsibility

l. Scope of practice

m. Teamwork

n. Willing to learn

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

4.32 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Distinguish differences among careers within health science pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).

6.12 Foundation Standard 6: Ethics: Understand accepted ethical practices with respect to cultural, social, and ethnic differences within the healthcare environment.

Identify ethical issues and their implications related to healthcare (such as: organ donation, in vitro fertilization, euthanasia, scope of practice, ethics committee).

7.41 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Observe all safety standards related to the Occupational Exposure to Hazardous Chemicals Standard (Safety Data Sheets (SDSs)). (www.osha.gov)

7.42 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Comply with safety signs, symbols, and labels.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Medical Interventions (MI)

National Health Science

Lesson 2.2

1.11 Foundation Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Identify basic levels of organization of the human body

a. Chemical

b. Cellular

c. Tissue

d. Organs

e. Systems

f. Organism

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.22 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Discuss research related to emerging diseases and disorders (such as: autism, VRSA, PTSD, Listeria, seasonal flu).

1.23 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe biomedical therapies as they relate to the prevention, pathology, and treatment of disease.

a. Gene testing

b. Gene therapy

c. Human proteomics

d. Cloning

e. Stem cell research

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

4.21 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Apply employability skills in healthcare.

a. Chain of command

b. Correct grammar

c. Decision making

d. Flexible

e. Initiative

f. Integrity

g. Loyalty

h. Positive attitude

i. Professional characteristics

j. Prompt and prepared

k. Responsibility

l. Scope of practice

m. Teamwork

n. Willing to learn

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

4.32 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Distinguish differences among careers within health science pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).

6.12 Foundation Standard 6: Ethics: Understand accepted ethical practices with respect to cultural, social, and ethnic differences within the healthcare environment.

Identify ethical issues and their implications related to healthcare (such as: organ donation, in vitro fertilization, euthanasia, scope of practice, ethics committee).

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Medical Interventions (MI)

National Health Science

Lesson 3.1

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.23 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe biomedical therapies as they relate to the prevention, pathology, and treatment of disease.

a. Gene testing

b. Gene therapy

c. Human proteomics

d. Cloning

e. Stem cell research

1.31 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate competency in basic math skills and mathematical conversions as they relate to healthcare.

a. Metric system (such as: centi, milli, kilo)

b. Mathematical (average, ratios, fractions, percentages, addition, subtraction, multiplication, division)

c. Conversions (height, weight/mass, length, volume, temperature, household measurements)

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

4.21 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Apply employability skills in healthcare.

a. Chain of command

b. Correct grammar

c. Decision making

d. Flexible

e. Initiative

f. Integrity

g. Loyalty

h. Positive attitude

i. Professional characteristics

j. Prompt and prepared

k. Responsibility

l. Scope of practice

m. Teamwork

n. Willing to learn

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

4.32 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Distinguish differences among careers within health science pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).

7.41 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Observe all safety standards related to the Occupational Exposure to Hazardous Chemicals Standard (Safety Data Sheets (SDSs)). (www.osha.gov)

7.42 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Comply with safety signs, symbols, and labels.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

9.11 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Promote behaviors of health and wellness (such as: nutrition, weight control, exercise, sleep habits).

9.12 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Describe strategies for prevention of disease.

a. Routine physical exams

b. Medical, dental, and mental health screenings

c. Community health education outreach programs

d. Immunizations

e. Stress management

f. Avoid risky behaviors

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Medical Interventions (MI)

National Health Science

Lesson 3.2

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.23 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe biomedical therapies as they relate to the prevention, pathology, and treatment of disease.

a. Gene testing

b. Gene therapy

c. Human proteomics

d. Cloning

e. Stem cell research

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

4.21 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Apply employability skills in healthcare.

a. Chain of command

b. Correct grammar

c. Decision making

d. Flexible

e. Initiative

f. Integrity

g. Loyalty

h. Positive attitude

i. Professional characteristics

j. Prompt and prepared

k. Responsibility

l. Scope of practice

m. Teamwork

n. Willing to learn

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

4.32 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Distinguish differences among careers within health science pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).

7.11 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Explain principles of infection control.

a. Chain of infection

b. Mode of transmission (direct, indirect, vectors, common vehicle [air, food, water], healthcare-associated infections [nosocomial], opportunistic)

c. Microorganisms (non-pathogenic, pathogenic, aerobic, anaerobic)

d. Classifications (bacteria, protozoa, fungi, viruses, parasites)

7.12 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Differentiate methods of controlling the spread and growth of microorganisms.

a. Aseptic control (antisepsis, disinfection, sterilization, sterile technique)

b. Standard precautions

c. Isolation precautions

d. Blood borne pathogen precautions

e. Vaccinations

7.41 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Observe all safety standards related to the Occupational Exposure to Hazardous Chemicals Standard (Safety Data Sheets (SDSs)). (www.osha.gov)

7.42 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Comply with safety signs, symbols, and labels.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

9.11 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Promote behaviors of health and wellness (such as: nutrition, weight control, exercise, sleep habits).

9.12 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Describe strategies for prevention of disease.

a. Routine physical exams

b. Medical, dental, and mental health screenings

c. Community health education outreach programs

d. Immunizations

e. Stress management

f. Avoid risky behaviors

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Medical Interventions (MI)

National Health Science

Lesson 3.3

1.11 Foundation Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Identify basic levels of organization of the human body

a. Chemical

b. Cellular

c. Tissue

d. Organs

e. Systems

f. Organism

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.31 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate competency in basic math skills and mathematical conversions as they relate to healthcare.

a. Metric system (such as: centi, milli, kilo)

b. Mathematical (average, ratios, fractions, percentages, addition, subtraction, multiplication, division)

c. Conversions (height, weight/mass, length, volume, temperature, household measurements)

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.12 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify common barriers to communication.

a. Physical disabilities (aphasia, hearing loss, impaired vision)

b. Psychological barriers (attitudes, bias, prejudice, stereotyping)

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

4.21 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Apply employability skills in healthcare.

a. Chain of command

b. Correct grammar

c. Decision making

d. Flexible

e. Initiative

f. Integrity

g. Loyalty

h. Positive attitude

i. Professional characteristics

j. Prompt and prepared

k. Responsibility

l. Scope of practice

m. Teamwork

n. Willing to learn

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

4.32 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Distinguish differences among careers within health science pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).

7.22 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Demonstrate principles of body mechanics.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

9.11 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Promote behaviors of health and wellness (such as: nutrition, weight control, exercise, sleep habits).

9.12 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Describe strategies for prevention of disease.

a. Routine physical exams

b. Medical, dental, and mental health screenings

c. Community health education outreach programs

d. Immunizations

e. Stress management

f. Avoid risky behaviors

10.11 *Foundation Standard 10: Technical Skills: Apply technical skills required for all career specialties and demonstrate skills and knowledge as appropriate.

Apply procedures for measuring and recording vital signs including the normal ranges (temperature, pulse, respirations, blood pressure, pain).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Medical Interventions (MI)

National Health Science

Lesson 3.4

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.22 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Discuss research related to emerging diseases and disorders (such as: autism, VRSA, PTSD, Listeria, seasonal flu).

1.23 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe biomedical therapies as they relate to the prevention, pathology, and treatment of disease.

a. Gene testing

b. Gene therapy

c. Human proteomics

d. Cloning

e. Stem cell research

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

4.21 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Apply employability skills in healthcare.

a. Chain of command

b. Correct grammar

c. Decision making

d. Flexible

e. Initiative

f. Integrity

g. Loyalty

h. Positive attitude

i. Professional characteristics

j. Prompt and prepared

k. Responsibility

l. Scope of practice

m. Teamwork

n. Willing to learn

6.12 Foundation Standard 6: Ethics: Understand accepted ethical practices with respect to cultural, social, and ethnic differences within the healthcare environment.

Identify ethical issues and their implications related to healthcare (such as: organ donation, in vitro fertilization, euthanasia, scope of practice, ethics committee).

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Medical Interventions (MI)

National Health Science

Lesson 4.1

1.11 Foundation Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Identify basic levels of organization of the human body

a. Chemical

b. Cellular

c. Tissue

d. Organs

e. Systems

f. Organism

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.23 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe biomedical therapies as they relate to the prevention, pathology, and treatment of disease.

a. Gene testing

b. Gene therapy

c. Human proteomics

d. Cloning

e. Stem cell research

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

4.21 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Apply employability skills in healthcare.

a. Chain of command

b. Correct grammar

c. Decision making

d. Flexible

e. Initiative

f. Integrity

g. Loyalty

h. Positive attitude

i. Professional characteristics

j. Prompt and prepared

k. Responsibility

l. Scope of practice

m. Teamwork

n. Willing to learn

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

4.32 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Distinguish differences among careers within health science pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).

7.11 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Explain principles of infection control.

a. Chain of infection

b. Mode of transmission (direct, indirect, vectors, common vehicle [air, food, water], healthcare-associated infections [nosocomial], opportunistic)

c. Microorganisms (non-pathogenic, pathogenic, aerobic, anaerobic)

d. Classifications (bacteria, protozoa, fungi, viruses, parasites)

7.12 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Differentiate methods of controlling the spread and growth of microorganisms.

a. Aseptic control (antisepsis, disinfection, sterilization, sterile technique)

b. Standard precautions

c. Isolation precautions

d. Blood borne pathogen precautions

e. Vaccinations

7.41 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Observe all safety standards related to the Occupational Exposure to Hazardous Chemicals Standard (Safety Data Sheets (SDSs)). (www.osha.gov)

7.42 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Comply with safety signs, symbols, and labels.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Medical Interventions (MI)

National Health Science

Lesson 4.2

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

4.21 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Apply employability skills in healthcare.

a. Chain of command

b. Correct grammar

c. Decision making

d. Flexible

e. Initiative

f. Integrity

g. Loyalty

h. Positive attitude

i. Professional characteristics

j. Prompt and prepared

k. Responsibility

l. Scope of practice

m. Teamwork

n. Willing to learn

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Medical Interventions (MI)

National Health Science

Lesson 4.3

1.11 Foundation Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Identify basic levels of organization of the human body

a. Chemical

b. Cellular

c. Tissue

d. Organs

e. Systems

f. Organism

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

4.21 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Apply employability skills in healthcare.

a. Chain of command

b. Correct grammar

c. Decision making

d. Flexible

e. Initiative

f. Integrity

g. Loyalty

h. Positive attitude

i. Professional characteristics

j. Prompt and prepared

k. Responsibility

l. Scope of practice

m. Teamwork

n. Willing to learn

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

4.32 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Distinguish differences among careers within health science pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).

6.12 Foundation Standard 6: Ethics: Understand accepted ethical practices with respect to cultural, social, and ethnic differences within the healthcare environment.

Identify ethical issues and their implications related to healthcare (such as: organ donation, in vitro fertilization, euthanasia, scope of practice, ethics committee).

7.41 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Observe all safety standards related to the Occupational Exposure to Hazardous Chemicals Standard (Safety Data Sheets (SDSs)). (www.osha.gov)

7.42 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Comply with safety signs, symbols, and labels.

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Medical Interventions (MI)

National Health Science

Lesson 4.4

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.21 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe common diseases and disorders of each body system (such as: cancer, diabetes, dementia, stroke, heart disease, tuberculosis, hepatitis, COPD, kidney disease, arthritis, ulcers).

a. Etiology

b. Pathology

c. Diagnosis

d. Treatment

e. Prevention

1.22 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Discuss research related to emerging diseases and disorders (such as: autism, VRSA, PTSD, Listeria, seasonal flu).

1.23 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe biomedical therapies as they relate to the prevention, pathology, and treatment of disease.

a. Gene testing

b. Gene therapy

c. Human proteomics

d. Cloning

e. Stem cell research

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

4.21 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Apply employability skills in healthcare.

a. Chain of command

b. Correct grammar

c. Decision making

d. Flexible

e. Initiative

f. Integrity

g. Loyalty

h. Positive attitude

i. Professional characteristics

j. Prompt and prepared

k. Responsibility

l. Scope of practice

m. Teamwork

n. Willing to learn

4.31 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Research levels of education, credentialing requirements, and employment trends in health professions.

4.32 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Distinguish differences among careers within health science pathways (diagnostic services, therapeutic services, health informatics, support services, or biotechnology research and development).

8.11 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Evaluate roles and responsibilities of team members.

a. Examples of healthcare teams

b. Responsibilities of team members

c. Benefits of teamwork

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Medical Interventions (MI)

Next Generation Science Standards

Lesson 1.1

HS.LS1.1 - From Molecules to Organisms: Structures and Processes

Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells. (HS-LS1-1),(Note: This Disciplinary Core Idea is also addressed by HS-LS3- 1.)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

DCI - LS3.A - Heredity: Inheritance and Variation of Traits - Inheritance of Traits

Each chromosome consists of a single very long DNA molecule, and each gene on the chromosome is a particular segment of that DNA . The instructions for forming species' characteristics are carried in DNA . All cells in an organism have the same genetic content, but the genes used (expressed) by the cell may be regulated in different ways. Not all DNA codes for a protein; some segments of DNA are involved in regulatory or structural functions, and some have no as-yet known function. (HS-LS3-1)

DCI - LS4.A - Biological Evolution: Unity and Diversity - Evidence of Common Ancestry and Diversity

Genetic information provides evidence of evolution. DNA sequences vary among species, but there are many overlaps; in fact, the ongoing branching that produces multiple lines of descent can be inferred by comparing the DNA sequences of different organisms. Such information is also derivable from the similarities and differences in amino acid sequences and from anatomical and embryological evidence. (HS-LS4-1)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Using Mathematics and Computational Thinking

Apply ratios, rates, percentages, and unit conversions in the context of complicated measurement problems involving quantities with derived or compound units (such as mg/mL, kg/m3 , acre-feet, etc.)

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Design, evaluate, and/or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

Science and Engineering Practice - Engaging in Argument from Evidence

Evaluate the claims, evidence, and/or reasoning behind currently accepted explanations or solutions to determine the merits of arguments.

Science and Engineering Practice - Engaging in Argument from Evidence

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Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Critically read scientific literature adapted for classroom use to determine the central ideas or conclusions and/or to obtain scientific and/or technical information to summarize complex evidence, concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

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Crosscutting Concepts - Patterns

Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Cause and effect relationships can be suggested and predicted for complex natural and human designed systems by examining what is known about smaller scale mechanisms within the system.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Changes in systems may have various causes that may not have equal effects.

Crosscutting Concepts - Scale, Proportion, and Quantity

Algebraic thinking is used to examine scientific data and predict the effect of a change in one variable on another (e.g., linear growth vs. exponential growth).

Crosscutting Concepts - Systems and System Models

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

Crosscutting Concepts - Systems and System Models

Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales.

Crosscutting Concepts - Structure and Function

The way an object is shaped or structured determines many of its properties and functions.

Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Medical Interventions (MI)

Next Generation Science Standards

Lesson 1.2

HS.LS1.1 - From Molecules to Organisms: Structures and Processes

Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.LS4.2 - Biological Evolution: Unity and Diversity

Construct an explanation based on evidence that the process of evolution primarily results from four factors: (1) the potential for a species to increase in number, (2) the heritable genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for limited resources, and (4) the proliferation of those organisms that are better able to survive and reproduce in the environment.

HS.LS4.4 - Biological Evolution: Unity and Diversity

Construct an explanation based on evidence for how natural selection leads to adaptation of populations.

HS.LS4.5 - Biological Evolution: Unity and Diversity

Evaluate the evidence supporting claims that changes in environmental conditions may result in: (1) increases in the number of individuals of some species, (2) the emergence of new species over time, and (3) the extinction of other species.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

DCI - LS4.B - Biological Evolution: Unity and Diversity - Natural Selection

Natural selection occurs only if there is both (1) variation in the genetic information between organisms in a population and (2) variation in the expression of that genetic information—that is, trait variation—that leads to differences in performance among individuals. (HS-LS4-2), (HS-LS4-3)

DCI - LS4.B - Biological Evolution: Unity and Diversity - Natural Selection

The traits that positively affect survival are more likely to be reproduced, and thus are more common in the population. (HS-LS4-3)

DCI - LS4.C - Biological Evolution: Unity and Diversity - Adaptation

Evolution is a consequence of the interaction of four factors: (1) the potential for a species to increase in number, (2) the genetic variation of individuals in a species due to mutation and sexual reproduction, (3) competition for an environment's limited supply of the resources that individuals need in order to survive and reproduce, and (4) the ensuing proliferation of those organisms that are better able to survive and reproduce in that environment. (HS-LS4-2)

DCI - LS4.C - Biological Evolution: Unity and Diversity - Adaptation

Natural selection leads to adaptation, that is, to a population dominated by organisms that are anatomically, behaviorally, and physiologically well suited to survive and reproduce in a specific environment. That is, the differential survival and reproduction of organisms in a population that have an advantageous heritable trait leads to an increase in the proportion of individuals in future generations that have the trait and to a decrease in the proportion of individuals that do not. (HS-LS4-3), (HS-LS4-4)

DCI - LS4.C - Biological Evolution: Unity and Diversity - Adaptation

Adaptation also means that the distribution of traits in a population can change when conditions change. (HS-LS4-3)

DCI - LS4.C - Biological Evolution: Unity and Diversity - Adaptation

Changes in the physical environment, whether naturally occurring or human induced, have thus contributed to the expansion of some species, the emergence of new distinct species as populations diverge under different conditions, and the decline–and sometimes the extinction–of some species. (HS-LS4-5), (HS-LS4-6)

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Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Developing and Using Models

Develop, revise, and/or use a model based on evidence to illustrate and/or predict the relationships between systems or between components of a system.

Science and Engineering Practice - Developing and Using Models

Develop and/or use multiple types of models to provide mechanistic accounts and/or predict phenomena, and move flexibly between model types based on merits and limitations.

Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Analyzing and Interpreting Data

Apply concepts of statistics and probability (including determining function fits to data, slope, intercept, and correlation coefficient for linear fits) to scientific and engineering questions and problems, using digital tools when feasible.

Science and Engineering Practice - Using Mathematics and Computational Thinking

Create and/or revise a computational model or simulation of a phenomenon, designed device, process, or system.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

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development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Crosscutting Concepts - Patterns

Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

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Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

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Crosscutting Concepts - Systems and System Models

Models can be used to predict the behavior of a system, but these predictions have limited precision and reliability due to the assumptions and approximations inherent in models.

Crosscutting Concepts - Structure and Function

The way an object is shaped or structured determines many of its properties and functions.

Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Crosscutting Concepts - Stability and Change

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Medical Interventions (MI)

Next Generation Science Standards

Lesson 1.3

HS.PS4.1 - Waves and Their Applications in Technologies for Information Transfer

Use mathematical representations to support a claim regarding relationships among the frequency, wavelength, and speed of waves traveling in various media.

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

DCI - PS3.A - Energy - Definitions of Energy

At the macroscopic scale, energy manifests itself in multiple ways, such as in motion, sound, light, and thermal energy . (HSPS3-2), (HS-PS3-3)

DCI - PS3.A - Energy - Definitions of Energy

These relationships are better understood at the microscopic scale, at which all of the different manifestations of energy can be modeled as a combination of energy associated with the motion of particles and energy associated with the configuration (relative position of the particles). In some cases the relative position energy can be thought of as stored in fields (which mediate interactions between particles). This last concept includes radiation, a phenomenon in which energy stored in fields moves across space. (HS-PS3-2)

DCI - PS3.B - Energy - Conservation of Energy and Energy Transfer

Energy cannot be created or destroyed, but it can be transported from one place to another and transferred between systems. (HS-PS3-1), (HS-PS3-4)

DCI - PS4.A - Waves and Their Applications in Technologies for Information Transfer - Wave Properties

The wavelength and frequency of a wave are related to one another by the speed of travel of the wave, which depends on the type of wave and the medium through which it is passing. (HS-PS4-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

Science and Engineering Practice - Asking questions and defining problems

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Science and Engineering Practice - Analyzing and Interpreting Data

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Science and Engineering Practice - Constructing Explanations and Designing Solutions

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Science and Engineering Practice - Constructing Explanations and Designing Solutions

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Crosscutting Concepts - Systems and System Models

Models can be used to predict the behavior of a system, but these predictions have limited precision and reliability due to the assumptions and approximations inherent in models.

Crosscutting Concepts - Energy and Matter: Flows, Cycles, and Conservation

Energy cannot be created or destroyed—only moves between one place and another place, between objects and/or fields, or between systems.

Crosscutting Concepts - Structure and Function

The way an object is shaped or structured determines many of its properties and functions.

Crosscutting Concepts - Structure and Function

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Crosscutting Concepts - Stability and Change

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Medical Interventions (MI)

Next Generation Science Standards

Lesson 1.4

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

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All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells. (HS-LS1-1), (Note: This Disciplinary Core Idea is also addressed by HS-LS3-1.)

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The way an object is shaped or structured determines many of its properties and functions.

Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Medical Interventions (MI)

Next Generation Science Standards

Lesson 2.1

HS.LS1.1 - From Molecules to Organisms: Structures and Processes

Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.LS3.1 - Heredity: Inheritance and Variation of Traits

Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

HS.LS3.2 - Heredity: Inheritance and Variation of Traits

Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells. (HS-LS1-1), (Note: This Disciplinary Core Idea is also addressed by HS-LS3- 1.)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

DCI - LS3.A - Heredity: Inheritance and Variation of Traits - Inheritance of Traits

Each chromosome consists of a single very long DNA molecule, and each gene on the chromosome is a particular segment of that DNA. The instructions for forming species' characteristics are carried in DNA. All cells in an organism have the same genetic content, but the genes used (expressed) by the cell may be regulated in different ways. Not all DNA codes for a protein; some segments of DNA are involved in regulatory or structural functions, and some have no as-yet known function. (HS-LS3-1)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Design, evaluate, and/or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

Science and Engineering Practice - Engaging in Argument from Evidence

Evaluate the claims, evidence, and/or reasoning behind currently accepted explanations or solutions to determine the merits of arguments.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Critically read scientific literature adapted for classroom use to determine the central ideas or conclusions and/or to obtain scientific and/or technical information to summarize complex evidence, concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

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Crosscutting Concepts - Patterns

Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Cause and effect relationships can be suggested and predicted for complex natural and human designed systems by examining what is known about smaller scale mechanisms within the system.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Changes in systems may have various causes that may not have equal effects.

Crosscutting Concepts - Systems and System Models

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

Crosscutting Concepts - Structure and Function

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Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Medical Interventions (MI)

Next Generation Science Standards

Lesson 2.2

HS.LS1.1 - From Molecules to Organisms: Structures and Processes

Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.LS3.1 - Heredity: Inheritance and Variation of Traits

Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells. (HS-LS1-1), (Note: This Disciplinary Core Idea is also addressed by HS-LS3-1.)

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Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

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Each chromosome consists of a single very long DNA molecule, and each gene on the chromosome is a particular segment of that DNA . The instructions for forming species' characteristics are carried in DNA . All cells in an organism have the same genetic content, but the genes used (expressed) by the cell may be regulated in different ways. Not all DNA codes for a protein; some segments of DNA are involved in regulatory or structural functions, and some have no as-yet known function. (HS-LS3-1)

DCI - LS3.B - Heredity: Inheritance and Variation of Traits - Variation of Traits

In sexual reproduction, chromosomes can sometimes swap sections during the process of meiosis (cell division), thereby creating new genetic combinations and thus more genetic variation. Although DNA replication is tightly regulated and remarkably accurate, errors do occur and result in mutations, which are also a source of genetic variation. Environmental factors can also cause mutations in genes, and viable mutations are inherited. (HS-LS3-2)

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Crosscutting Concepts - Scale, Proportion, and Quantity

Algebraic thinking is used to examine scientific data and predict the effect of a change in one variable on another (e.g., linear growth vs. exponential growth).

Crosscutting Concepts - Systems and System Models

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Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Medical Interventions (MI)

Next Generation Science Standards

Lesson 3.1

HS.LS1.1 - From Molecules to Organisms: Structures and Processes

Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.LS3.2 - Heredity: Inheritance and Variation of Traits

Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.

DCI - PS4.C - Waves and Their Applications in Technologies for Information Transfer - Information Technologies and Instrumentation

Multiple technologies based on the understanding of waves and their interactions with matter are part of everyday experiences in the modern world (e.g., medical imaging, communications, scanners) and in scientific research. They are essential tools for producing, transmitting, and capturing signals and for storing and interpreting the information contained in them. (HS-PS4- 5)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells. (HS-LS1-1), (Note: This Disciplinary Core Idea is also addressed by HS-LS3- 1.)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

DCI - LS1.B - From Molecules to Organisms: Structures and Processes - Growth and Development of Organisms

In multicellular organisms individual cells grow and then divide via a process called mitosis, thereby allowing the organism to grow. The organism begins as a single cell (fertilized egg) that divides successively to produce many cells, with each parent cell passing identical genetic material (two variants of each chromosome pair) to both daughter cells. Cellular division and differentiation produce and maintain a complex organism, composed of systems of tissues and organs that work together to meet the needs of the whole organism. (HS-LS1-4)

DCI - LS3.A - Heredity: Inheritance and Variation of Traits - Inheritance of Traits

Each chromosome consists of a single very long DNA molecule, and each gene on the chromosome is a particular segment of that DNA. The instructions for forming species' characteristics are carried in DNA. All cells in an organism have the same genetic content, but the genes used (expressed) by the cell may be regulated in different ways. Not all DNA codes for a protein; some segments of DNA are involved in regulatory or structural functions, and some have no as-yet known function. (HS-LS3-1)

DCI - LS3.B - Heredity: Inheritance and Variation of Traits - Variation of Traits

In sexual reproduction, chromosomes can sometimes swap sections during the process of meiosis (cell division), thereby creating new genetic combinations and thus more genetic variation. Although DNA replication is tightly regulated and remarkably accurate, errors do occur and result in mutations, which are also a source of genetic variation. Environmental factors can also cause mutations in genes, and viable mutations are inherited. (HS-LS3-2)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

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- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

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- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Analyzing and Interpreting Data

Apply concepts of statistics and probability (including determining function fits to data, slope, intercept, and correlation coefficient for linear fits) to scientific and engineering questions and problems, using digital tools when feasible.

Science and Engineering Practice - Using Mathematics and Computational Thinking

Apply techniques of algebra and functions to represent and solve scientific and engineering problems.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

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Crosscutting Concepts - Patterns

Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Cause and effect relationships can be suggested and predicted for complex natural and human designed systems by examining what is known about smaller scale mechanisms within the system.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Changes in systems may have various causes that may not have equal effects.

Crosscutting Concepts - Scale, Proportion, and Quantity

Algebraic thinking is used to examine scientific data and predict the effect of a change in one variable on another (e.g., linear growth vs. exponential growth).

Crosscutting Concepts - Systems and System Models

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

Crosscutting Concepts - Systems and System Models

Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales.

Crosscutting Concepts - Systems and System Models

Models can be used to predict the behavior of a system, but these predictions have limited precision and reliability due to the assumptions and approximations inherent in models.

Crosscutting Concepts - Structure and Function

The way an object is shaped or structured determines many of its properties and functions.

Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Medical Interventions (MI)

Next Generation Science Standards

Lesson 3.2

HS.LS1.1 - From Molecules to Organisms: Structures and Processes

Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.LS3.1 - Heredity: Inheritance and Variation of Traits

Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

HS.LS3.2 - Heredity: Inheritance and Variation of Traits

Make and defend a claim based on evidence that inheritable genetic variations may result from: (1) new genetic combinations through meiosis, (2) viable errors occurring during replication, and/or (3) mutations caused by environmental factors.

DCI - PS4.B - Waves and Their Applications in Technologies for Information Transfer - Electromagnetic Radiation

When light or longer wavelength electromagnetic radiation is absorbed in matter, it is generally converted into thermal energy (heat). Shorter wavelength electromagnetic radiation (ultraviolet, X-rays, gamma rays) can ionize atoms and cause damage to living cells. (HS-PS4-4)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells. (HS-LS1-1), (Note: This Disciplinary Core Idea is also addressed by HS-LS3- 1.)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

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DCI - LS3.B - Heredity: Inheritance and Variation of Traits - Variation of Traits

In sexual reproduction, chromosomes can sometimes swap sections during the process of meiosis (cell division), thereby creating new genetic combinations and thus more genetic variation. Although DNA replication is tightly regulated and remarkably accurate, errors do occur and result in mutations, which are also a source of genetic variation. Environmental factors can also cause mutations in genes, and viable mutations are inherited. (HS-LS3-2)

DCI - LS4.C - Biological Evolution: Unity and Diversity - Adaptation

Changes in the physical environment, whether naturally occurring or human induced, have thus contributed to the expansion of some species, the emergence of new distinct species as populations diverge under different conditions, and the decline–and sometimes the extinction–of some species. (HS-LS4-5), (HS-LS4-6)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Asking questions and defining problems

Evaluate a question to determine if it is testable and relevant.

Science and Engineering Practice - Asking questions and defining problems

Ask questions that can be investigated within the scope of the school laboratory, research facilities, or field (e.g., outdoor environment) with available resources and, when appropriate, frame a hypothesis based on a model or theory.

Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Developing and Using Models

Develop, revise, and/or use a model based on evidence to illustrate and/or predict the relationships between systems or between components of a system.

Science and Engineering Practice - Developing and Using Models

Develop and/or use multiple types of models to provide mechanistic accounts and/or predict phenomena, and move flexibly between model types based on merits and limitations.

Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan an investigation or test a design individually and collaboratively to produce data to serve as the basis for evidence as part of building and revising models, supporting explanations for phenomena, or testing solutions to problems. Consider possible confounding variables or effects and evaluate the investigation's design to ensure variables are controlled.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan and conduct an investigation or test a design solution in a safe and ethical manner including considerations of environmental, social, and personal impacts.

Science and Engineering Practice - Planning and Carrying Out Investigations

Select appropriate tools to collect, record, analyze, and evaluate data. Make directional hypotheses that specify what happens to a dependent variable when an independent variable is manipulated.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Analyzing and Interpreting Data

Apply concepts of statistics and probability (including determining function fits to data, slope, intercept, and correlation coefficient for linear fits) to scientific and engineering questions and problems, using digital tools when feasible.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Make a quantitative and/or qualitative claim regarding the relationship between dependent and independent variables.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Design, evaluate, and/or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

Science and Engineering Practice - Engaging in Argument from Evidence

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Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Cause and effect relationships can be suggested and predicted for complex natural and human designed systems by examining what is known about smaller scale mechanisms within the system.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Changes in systems may have various causes that may not have equal effects.

Crosscutting Concepts - Scale, Proportion, and Quantity

Algebraic thinking is used to examine scientific data and predict the effect of a change in one variable on another (e.g., linear growth vs. exponential growth).

Crosscutting Concepts - Systems and System Models

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

Crosscutting Concepts - Systems and System Models

Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales.

Crosscutting Concepts - Systems and System Models

Models can be used to predict the behavior of a system, but these predictions have limited precision and reliability due to the assumptions and approximations inherent in models.

Crosscutting Concepts - Structure and Function

The way an object is shaped or structured determines many of its properties and functions.

Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Medical Interventions (MI)

Next Generation Science Standards

Lesson 3.3

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Asking questions and defining problems

Evaluate a question to determine if it is testable and relevant.

Science and Engineering Practice - Asking questions and defining problems

Ask questions that can be investigated within the scope of the school laboratory, research facilities, or field (e.g., outdoor environment) with available resources and, when appropriate, frame a hypothesis based on a model or theory.

Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Asking questions and defining problems

Define a design problem that involves the development of a process or system with interacting components and criteria and constraints that may include social, technical, and/or environmental considerations.

Science and Engineering Practice - Developing and Using Models

Design a test of a model to ascertain its reliability.

Science and Engineering Practice - Developing and Using Models

Develop, revise, and/or use a model based on evidence to illustrate and/or predict the relationships between systems or between components of a system.

Science and Engineering Practice - Developing and Using Models

Develop and/or use multiple types of models to provide mechanistic accounts and/or predict phenomena, and move flexibly between model types based on merits and limitations.

Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan an investigation or test a design individually and collaboratively to produce data to serve as the basis for evidence as part of building and revising models, supporting explanations for phenomena, or testing solutions to problems. Consider possible confounding variables or effects and evaluate the investigation's design to ensure variables are controlled.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan and conduct an investigation or test a design solution in a safe and ethical manner including considerations of environmental, social, and personal impacts.

Science and Engineering Practice - Planning and Carrying Out Investigations

Select appropriate tools to collect, record, analyze, and evaluate data. Make directional hypotheses that specify what happens to a dependent variable when an independent variable is manipulated.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Analyzing and Interpreting Data

Apply concepts of statistics and probability (including determining function fits to data, slope, intercept, and correlation coefficient for linear fits) to scientific and engineering questions and problems, using digital tools when feasible.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Make a quantitative and/or qualitative claim regarding the relationship between dependent and independent variables.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Design, evaluate, and/or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

Science and Engineering Practice - Engaging in Argument from Evidence

Evaluate the claims, evidence, and/or reasoning behind currently accepted explanations or solutions to determine the merits of arguments.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Critically read scientific literature adapted for classroom use to determine the central ideas or conclusions and/or to obtain scientific and/or technical

information to summarize complex evidence, concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Crosscutting Concepts - Patterns

Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

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Crosscutting Concepts - Structure and Function

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Crosscutting Concepts - Stability and Change

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Medical Interventions (MI)

Next Generation Science Standards

Lesson 3.4

HS.PS2.6 - Motion and Stability: Forces and Interactions

Communicate scientific and technical information about why the molecular-level structure is important in the functioning of designed materials.

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.ETS1.2 - Engineering Design

Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

HS.ETS1.3 - Engineering Design

Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

DCI - ETS1.A - Engineering Design - Defining and Delimiting Engineering Problems

Criteria and constraints also include satisfying any requirements set by society, such as taking issues of risk mitigation into account, and they should be quantified to the extent possible and stated in such a way that one can tell if a given design meets them. (secondary to HS-PS2- 3)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells. (HS-LS1-1), (Note: This Disciplinary Core Idea is also addressed by HS-LS3- 1.)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

DCI - LS3.B - Heredity: Inheritance and Variation of Traits - Variation of Traits

In sexual reproduction, chromosomes can sometimes swap sections during the process of meiosis (cell division), thereby creating new genetic combinations and thus more genetic variation. Although DNA replication is tightly regulated and remarkably accurate, errors do occur and result in mutations, which are also a source of genetic variation. Environmental factors can also cause mutations in genes, and viable mutations are inherited. (HS-LS3-2)

Science and Engineering Practice - Asking questions and defining problems

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Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Asking questions and defining problems

Define a design problem that involves the development of a process or system with interacting components and criteria and constraints that may include social, technical, and/or environmental considerations.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Design, evaluate, and/or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

Science and Engineering Practice - Engaging in Argument from Evidence

Evaluate the claims, evidence, and/or reasoning behind currently accepted explanations or solutions to determine the merits of arguments.

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Crosscutting Concepts - Patterns

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Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Changes in systems may have various causes that may not have equal effects.

Crosscutting Concepts - Systems and System Models

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

Crosscutting Concepts - Systems and System Models

Systems can be designed to do specific tasks.

Crosscutting Concepts - Structure and Function

The way an object is shaped or structured determines many of its properties and functions.

Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Medical Interventions (MI)

Next Generation Science Standards

Lesson 4.1

HS.LS1.1 - From Molecules to Organisms: Structures and Processes

Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells. (HS-LS1-1), (Note: This Disciplinary Core Idea is also addressed by HS-LS3- 1.)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system. (HS-LS1-3)

DCI - LS3.A - Heredity: Inheritance and Variation of Traits - Inheritance of Traits

Each chromosome consists of a single very long DNA molecule, and each gene on the chromosome is a particular segment of that DNA. The instructions for forming species' characteristics are carried in DNA. All cells in an organism have

the same genetic content, but the genes used (expressed) by the cell may be regulated in different ways. Not all DNA codes for a protein; some segments of DNA are involved in regulatory or structural functions, and some have no as-yet known function. (HS-LS3-1)

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Science and Engineering Practice - Analyzing and Interpreting Data

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Science and Engineering Practice - Constructing Explanations and Designing Solutions

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Science and Engineering Practice - Engaging in Argument from Evidence

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Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Crosscutting Concepts - Stability and Change

Feedback (negative or positive) can stabilize or destabilize a system.

Medical Interventions (MI)

Next Generation Science Standards

Lesson 4.2

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

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Medical Interventions (MI)

Next Generation Science Standards

Lesson 4.3

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.LS3.1 - Heredity: Inheritance and Variation of Traits

Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

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Science and Engineering Practice - Developing and Using Models

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Science and Engineering Practice - Developing and Using Models

Develop and/or use multiple types of models to provide mechanistic accounts and/or predict phenomena, and move flexibly between model types based on merits and limitations.

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Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Design, evaluate, and/or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

Science and Engineering Practice - Engaging in Argument from Evidence

Evaluate the claims, evidence, and/or reasoning behind currently accepted explanations or solutions to determine the merits of arguments.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Critically read scientific literature adapted for classroom use to determine the central ideas or conclusions and/or to obtain scientific and/or technical information to summarize complex evidence, concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Crosscutting Concepts - Patterns

Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Cause and effect relationships can be suggested and predicted for complex natural and human designed systems by examining what is known about smaller scale mechanisms within the system.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Changes in systems may have various causes that may not have equal effects.

Crosscutting Concepts - Systems and System Models

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

Crosscutting Concepts - Systems and System Models

Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales.

Crosscutting Concepts - Systems and System Models

Models can be used to predict the behavior of a system, but these predictions have limited precision and reliability due to the assumptions and approximations inherent in models.

Crosscutting Concepts - Structure and Function

The way an object is shaped or structured determines many of its properties and functions.

Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Medical Interventions (MI)

Next Generation Science Standards

Lesson 4.4

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.ETS1.2 - Engineering Design

Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

HS.ETS1.3 - Engineering Design

Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

DCI - ETS1.A - Engineering Design - Defining and Delimiting Engineering Problems

Criteria and constraints also include satisfying any requirements set by society, such as taking issues of risk mitigation into account, and they should be quantified to the extent possible and stated in such a way that one can tell if a given design meets them. (secondary to HS-PS2- 3)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Asking questions and defining problems

Define a design problem that involves the development of a process or system with interacting components and criteria and constraints that may include social, technical, and/or environmental considerations.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Design, evaluate, and/or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

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Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Systems can be designed to cause a desired effect.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Changes in systems may have various causes that may not have equal effects.

Crosscutting Concepts - Systems and System Models

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

Crosscutting Concepts - Systems and System Models

Systems can be designed to do specific tasks.

Crosscutting Concepts - Structure and Function

The way an object is shaped or structured determines many of its properties and functions.

Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Crosscutting Concepts - Stability and Change

Much of science deals with constructing explanations of how things change and how they remain stable.

Biomedical Innovation (BI)

Common Core State Standards for English Language Arts

Lesson 1.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.6 - Reading

Assess how point of view or purpose shapes the content and style of a text.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.8 - Reading

Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.3 - Writing

Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.3 - Speaking and Listening

Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.3 - Language

Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

Biomedical Innovation (BI)

Common Core State Standards for English Language Arts

Lesson 2.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.4 - Reading

Interpret words and phrases as they are used in a text, including determining technical, connotative, and figurative meanings, and analyze how specific word choices shape meaning or tone.

AS.R.6 - Reading

Assess how point of view or purpose shapes the content and style of a text.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.8 - Reading

Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

AS.R.9 - Reading

Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.SL.6 - Speaking and Listening

Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.3 - Language

Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

Biomedical Innovation (BI)

Common Core State Standards for English Language Arts

Lesson 3.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.9 - Reading

Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.3 - Language

Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Biomedical Innovation (BI)

Common Core State Standards for English Language Arts

Lesson 4.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.9 - Reading

Analyze how two or more texts address similar themes or topics in order to build knowledge or to compare the approaches the authors take.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.3 - Writing

Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.3 - Language

Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

Biomedical Innovation (BI)

Common Core State Standards for English Language Arts

Lesson 5.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.8 - Reading

Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.3 - Writing

Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.SL.6 - Speaking and Listening

Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.3 - Language

Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.5 - Language

Demonstrate understanding of word relationships and nuances in word meanings.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Biomedical Innovation (BI)

Common Core State Standards for English Language Arts

Lesson 6.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.3 - Language

Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

Biomedical Innovation (BI)

Common Core State Standards for English Language Arts

Lesson 7.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.3 - Writing

Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.3 - Language

Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

Biomedical Innovation (BI)

Common Core State Standards for English Language Arts

Lesson 8.1

AS.R.1 - Reading

Read closely to determine what the text says explicitly and to make logical inferences from it; cite specific textual evidence when writing or speaking to support conclusions drawn from the text.

AS.R.2 - Reading

Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.

AS.R.7 - Reading

Integrate and evaluate content presented in diverse formats and media, including visually and quantitatively, as well as in words.

AS.R.8 - Reading

Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.

AS.R.10 - Reading

Read and comprehend complex literary and informational texts independently and proficiently.

AS.W.1 - Writing

Write arguments to support claims in an analysis of substantive topics or texts, using valid reasoning and relevant and sufficient evidence.

AS.W.2 - Writing

Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.

AS.W.3 - Writing

Write narratives to develop real or imagined experiences or events using effective technique, well-chosen details, and well-structured event sequences.

AS.W.4 - Writing

Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.

AS.W.5 - Writing

Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach.

AS.W.6 - Writing

Use technology, including the Internet, to produce and publish writing and to interact and collaborate with others.

AS.W.7 - Writing

Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.

AS.W.8 - Writing

Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.

AS.W.9 - Writing

Draw evidence from literary or informational texts to support analysis, reflection, and research.

AS.W.10 - Writing

Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences.

AS.SL.1 - Speaking and Listening

Prepare for and participate effectively in a range of conversations and collaborations with diverse partners, building on others' ideas and expressing their own clearly and persuasively.

AS.SL.2 - Speaking and Listening

Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.

AS.SL.4 - Speaking and Listening

Present information, findings, and supporting evidence such that listeners can follow the line of reasoning and the organization, development, and style are appropriate to task, purpose, and audience.

AS.SL.5 - Speaking and Listening

Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.

AS.SL.6 - Speaking and Listening

Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.

AS.L.1 - Language

Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

AS.L.2 - Language

Demonstrate command of the conventions of standard English capitalization, punctuation, and spelling when writing.

AS.L.3 - Language

Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.

AS.L.4 - Language

Determine or clarify the meaning of unknown and multiple-meaning words and phrases by using context clues, analyzing meaningful word parts, and consulting general and specialized reference materials, as appropriate.

AS.L.5 - Language

Demonstrate understanding of word relationships and nuances in word meanings.

AS.L.6 - Language

Acquire and use accurately a range of general academic and domain-specific words and phrases sufficient for reading, writing, speaking, and listening at the college and career readiness level; demonstrate independence in gathering vocabulary knowledge when considering a word or phrase important to comprehension or expression.

Biomedical Innovation (BI)

Common Core State Standards for Mathematics

Lesson 1.1

N.Q.2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

S.ID.1 - Interpreting Categorical and Quantitative Data

Represent data with plots on the real number line (dot plots, histograms, and box plots).

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Biomedical Innovation (BI)

Common Core State Standards for Mathematics

Lesson 2.1

N.Q.1 - Quantities

Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N.Q.2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

N.Q 3 - Quantities

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

A.SSE.1.a - Seeing Structure in Expressions

Interpret parts of an expression, such as terms, factors, and coefficients.

A.CED.4 - Creating Equations

Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law V = IR to highlight resistance R.

A.REI.1 - Reasoning with Equations and Inequalities

Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

A.REI.2 - Reasoning with Equations and Inequalities

Solve simple rational and radical equations in one variable, and give examples showing how extraneous solutions may arise.

A.REI.3 - Reasoning with Equations and Inequalities

Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

S.ID.2 - Interpreting Categorical and Quantitative Data

Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.

S.ID.3 - Interpreting Categorical and Quantitative Data

Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

S.ID.9 - Interpreting Categorical and Quantitative Data

Distinguish between correlation and causation.

S.IC.1 - Making Inferences and Justifying Conclusions

Understand statistics as a process for making inferences about population parameters based on a random sample from that population.

S.IC.2 - Making Inferences and Justifying Conclusions

Decide if a specified model is consistent with results from a given data-generating process, e.g., using simulation. For example, a model says a spinning coin falls heads up with probability 0.5. Would a result of 5 tails in a row cause you to question the model?

S.IC.3 - Making Inferences and Justifying Conclusions

Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.

S.IC.4 - Making Inferences and Justifying Conclusions

Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.

S.IC.5 - Making Inferences and Justifying Conclusions

Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Biomedical Innovation (BI)

Common Core State Standards for Mathematics

Lesson 4.1

N.Q.1 - Quantities

Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N.Q.2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

N.Q.3 - Quantities

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

F.IF.4 - Interpreting Functions

For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

F.IF.7 - Interpreting Functions

Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

S.ID.1 - Interpreting Categorical and Quantitative Data

Represent data with plots on the real number line (dot plots, histograms, and box plots).

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Biomedical Innovation (BI)

Common Core State Standards for Mathematics

Lesson 5.1

N.Q.1 - Quantities

Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N.Q.2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

N.Q.3 - Quantities

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

A.REI.1 - Reasoning with Equations and Inequalities

Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

S.ID.9 - Interpreting Categorical and Quantitative Data

Distinguish between correlation and causation.

S.IC.1 - Making Inferences and Justifying Conclusions

Understand statistics as a process for making inferences about population parameters based on a random sample from that population.

S.IC.3 - Making Inferences and Justifying Conclusions

Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.

S.IC.5 - Making Inferences and Justifying Conclusions

Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Biomedical Innovation (BI)

Common Core State Standards for Mathematics

Lesson 6.1

N.Q.1 - Quantities

Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N.Q.2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Biomedical Innovation (BI)

Common Core State Standards for Mathematics

Lesson 7.1

N.Q.2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

N.Q.3 - Quantities

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Biomedical Innovation (BI)

Common Core State Standards for Mathematics

Lesson 8.1

N.Q.1 - Quantities

Use units as a way to understand problems and to guide the solution of multistep problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

N.Q.2 - Quantities

Define appropriate quantities for the purpose of descriptive modeling.

N.Q.3 - Quantities

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

A.SSE.1 - Seeing Structure in Expressions

Interpret expressions that represent a quantity in terms of its context.

A.SSE.1.a - Seeing Structure in Expressions

Interpret parts of an expression, such as terms, factors, and coefficients.

A.REI.1 - Reasoning with Equations and Inequalities

Explain each step in solving a simple equation as following from the equality of numbers asserted at the previous step, starting from the assumption that the original equation has a solution. Construct a viable argument to justify a solution method.

F.IF.4 - Interpreting Functions

For a function that models a relationship between two quantities, interpret key features of graphs and tables in terms of the quantities, and sketch graphs showing key features given a verbal description of the relationship. Key features include: intercepts; intervals where the function is increasing, decreasing, positive, or negative; relative maximums and minimums; symmetries; end behavior; and periodicity.

F.IF.7 - Interpreting Functions

Graph functions expressed symbolically and show key features of the graph, by hand in simple cases and using technology for more complicated cases.

S.ID.1 - Interpreting Categorical and Quantitative Data

Represent data with plots on the real number line (dot plots, histograms, and box plots).

S.ID.2 - Interpreting Categorical and Quantitative Data

Use statistics appropriate to the shape of the data distribution to compare center (median, mean) and spread (interquartile range, standard deviation) of two or more different data sets.

S.ID.3 - Interpreting Categorical and Quantitative Data

Interpret differences in shape, center, and spread in the context of the data sets, accounting for possible effects of extreme data points (outliers).

S.ID.9 - Interpreting Categorical and Quantitative Data

Distinguish between correlation and causation.

S.IC.1 - Making Inferences and Justifying Conclusions

Understand statistics as a process for making inferences about population parameters based on a random sample from that population.

S.IC.3 - Making Inferences and Justifying Conclusions

Recognize the purposes of and differences among sample surveys, experiments, and observational studies; explain how randomization relates to each.

S.IC.4 - Making Inferences and Justifying Conclusions

Use data from a sample survey to estimate a population mean or proportion; develop a margin of error through the use of simulation models for random sampling.

S.IC.5 - Making Inferences and Justifying Conclusions

Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.

S.IC.6 - Making Inferences and Justifying Conclusions

Evaluate reports based on data.

Biomedical Innovation (BI)

National Health Science

Lesson 1.1

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.21 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Apply employability skills in healthcare.

a. Chain of command

b. Correct grammar

c. Decision making

d. Flexible

e. Initiative

f. Integrity

g. Loyalty

h. Positive attitude

i. Professional characteristics

j. Prompt and prepared

k. Responsibility

l. Scope of practice

m. Teamwork

n. Willing to learn

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Biomedical Innovation (BI)

National Health Science

Lesson 2.1

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.31 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate competency in basic math skills and mathematical conversions as they relate to healthcare.

a. Metric system (such as: centi, milli, kilo)

b. Mathematical (average, ratios, fractions, percentages, addition, subtraction, multiplication, division)

c. Conversions (height, weight/mass, length, volume, temperature, household measurements)

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.21 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Apply employability skills in healthcare.

a. Chain of command

b. Correct grammar

c. Decision making

d. Flexible

e. Initiative

f. Integrity

g. Loyalty

h. Positive attitude

i. Professional characteristics

j. Prompt and prepared

k. Responsibility

l. Scope of practice

m. Teamwork

n. Willing to learn

7.22 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Demonstrate principles of body mechanics.

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

10.11 *Foundation Standard 10: Technical Skills: Apply technical skills required for all career specialties and demonstrate skills and knowledge as appropriate.

Apply procedures for measuring and recording vital signs including the normal ranges (temperature, pulse, respirations, blood pressure, pain).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Biomedical Innovation (BI)

National Health Science

Lesson 3.1

1.23 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe biomedical therapies as they relate to the prevention, pathology, and treatment of disease.

a. Gene testing

b. Gene therapy

c. Human proteomics

d. Cloning

e. Stem cell research

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

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Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.21 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Apply employability skills in healthcare.

a. Chain of command

b. Correct grammar

c. Decision making

d. Flexible

e. Initiative

f. Integrity

g. Loyalty

h. Positive attitude

i. Professional characteristics

j. Prompt and prepared

k. Responsibility

l. Scope of practice

m. Teamwork

n. Willing to learn

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

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b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

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g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

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Analyze attributes and attitudes of an effective leader.

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Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Biomedical Innovation (BI)

National Health Science

Lesson 4.1

1.31 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate competency in basic math skills and mathematical conversions as they relate to healthcare.

a. Metric system (such as: centi, milli, kilo)

b. Mathematical (average, ratios, fractions, percentages, addition, subtraction, multiplication, division)

c. Conversions (height, weight/mass, length, volume, temperature, household measurements)

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

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Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.21 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Apply employability skills in healthcare.

a. Chain of command

b. Correct grammar

c. Decision making

d. Flexible

e. Initiative

f. Integrity

g. Loyalty

h. Positive attitude

i. Professional characteristics

j. Prompt and prepared

k. Responsibility

l. Scope of practice

m. Teamwork

n. Willing to learn

7.11 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Explain principles of infection control.

a. Chain of infection

b. Mode of transmission (direct, indirect, vectors, common vehicle [air, food, water], healthcare-associated infections [nosocomial], opportunistic)

c. Microorganisms (non-pathogenic, pathogenic, aerobic, anaerobic)

d. Classifications (bacteria, protozoa, fungi, viruses, parasites)

7.12 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Differentiate methods of controlling the spread and growth of microorganisms.

a. Aseptic control (antisepsis, disinfection, sterilization, sterile technique)

b. Standard precautions

c. Isolation precautions

d. Blood borne pathogen precautions

e. Vaccinations

7.21 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Apply personal safety procedures based on Occupational Safety and Health Administration (OSHA) and Centers for Disease Control (CDC) regulations.

7.31 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Apply safety techniques in the work environment.

a. Ergonomics

b. Safe operation of equipment

c. Patient/client safety measures (check area for safety)

7.41 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Observe all safety standards related to the Occupational Exposure to Hazardous Chemicals Standard (Safety Data Sheets (SDSs)). (www.osha.gov)

7.42 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Comply with safety signs, symbols, and labels.

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

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Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Biomedical Innovation (BI)

National Health Science

Lesson 5.1

1.31 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate competency in basic math skills and mathematical conversions as they relate to healthcare.

a. Metric system (such as: centi, milli, kilo)

b. Mathematical (average, ratios, fractions, percentages, addition, subtraction, multiplication, division)

c. Conversions (height, weight/mass, length, volume, temperature, household measurements)

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.21 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Apply employability skills in healthcare.

a. Chain of command

b. Correct grammar

c. Decision making

d. Flexible

e. Initiative

f. Integrity

g. Loyalty

h. Positive attitude

i. Professional characteristics

j. Prompt and prepared

k. Responsibility

l. Scope of practice

m. Teamwork

n. Willing to learn

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

8.23 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

9.11 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Promote behaviors of health and wellness (such as: nutrition, weight control, exercise, sleep habits).

9.12 Foundation Standard 9: Health Maintenance Practices: Differentiate between wellness and disease. Promote disease prevention and model healthy behaviors.

Describe strategies for prevention of disease.

a. Routine physical exams

b. Medical, dental, and mental health screenings

c. Community health education outreach programs

d. Immunizations

e. Stress management

f. Avoid risky behaviors

11.31 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

11.32 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Biomedical Innovation (BI)

National Health Science

Lesson 6.1

1.23 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Describe biomedical therapies as they relate to the prevention, pathology, and treatment of disease.

a. Gene testing

b. Gene therapy

c. Human proteomics

d. Cloning

e. Stem cell research

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

2.16 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Modify communication to meet the needs of the patient/client and be appropriate to the situation.

2.31 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.21 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Apply employability skills in healthcare.

a. Chain of command

b. Correct grammar

c. Decision making

d. Flexible

e. Initiative

f. Integrity

g. Loyalty

h. Positive attitude

i. Professional characteristics

j. Prompt and prepared

k. Responsibility

l. Scope of practice

m. Teamwork

n. Willing to learn

7.12 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Differentiate methods of controlling the spread and growth of microorganisms.

a. Aseptic control (antisepsis, disinfection, sterilization, sterile technique)

b. Standard precautions

c. Isolation precautions

d. Blood borne pathogen precautions

e. Vaccinations

7.21 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Apply personal safety procedures based on Occupational Safety and Health Administration (OSHA) and Centers for Disease Control (CDC) regulations.

7.31 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Apply safety techniques in the work environment.

a. Ergonomics

b. Safe operation of equipment

c. Patient/client safety measures (check area for safety)

7.41 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Observe all safety standards related to the Occupational Exposure to Hazardous Chemicals Standard (Safety Data Sheets (SDSs)). (www.osha.gov)

7.42 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Comply with safety signs, symbols, and labels.

7.51 Foundation Standard 7: Safety Practices: Identify existing and potential hazards to clients, co-workers, and self. Employ safe work practices and follow health and safety policies and procedures to prevent injury and illness.

Practice fire safety in a healthcare setting.

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

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Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

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Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

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Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

11.35 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Evaluate validity of web-based resources.

Biomedical Innovation (BI)

National Health Science

Lesson 7.1

1.11 Foundation Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Identify basic levels of organization of the human body

a. Chemical

b. Cellular

c. Tissue

d. Organs

e. Systems

f. Organism

1.13 Foundation Standard 1: Academic Foundation Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Analyze basic structures and functions of human body systems (skeletal, muscular, integumentary, cardiovascular, lymphatic, respiratory, nervous, special senses, endocrine, digestive, urinary, and reproductive).

a. Skeletal (bone anatomy, axial and appendicular skeletal bones, functions of bones, ligaments, types of joints)

b. Muscular (microscopic anatomy of muscle tissue, types of muscle, locations of skeletal muscles, functions of muscles, tendons, directional movements)

c. Integumentary (layers, structures and functions of skin)

d. Cardiovascular (components of blood, structures and functions of blood components, structures and functions of the cardiovascular system, conduction system of the heart, cardiac cycle)

e. Lymphatic (structures and functions of lymphatic system, movement of lymph fluid)

f. Respiratory (structures and functions of respiratory system, physiology of respiration)

g. Nervous (structures and functions of nervous tissue and system, organization of nervous system)

h. Special senses (structures and functions of eye, ear, nose and tongue; identify senses for sight, hearing, smell, taste, touch)

i. Endocrine (endocrine versus exocrine, structures and functions of endocrine system, hormones, regulation of hormones)

j. Digestive (structures and functions of gastrointestinal tract, chemical and mechanical digestion, structures and functions of accessory organs)

k. Urinary (structures and functions of urinary system, gross and microscopic anatomy, process of urine formation, urine composition, homeostatic balance)

l. Reproductive (structures and functions of male and female reproductive systems, formation of gametes, hormone production and effects, menstrual cycle, and conception)

1.32 Foundation: Standard 1: Academic Foundation: Understand human anatomy, physiology, common diseases and disorders, and medical math principles.

Demonstrate the ability to analyze diagrams, charts, graphs, and tables to interpret healthcare results.

2.11 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Model verbal and nonverbal communication.

2.13 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Identify the differences between subjective and objective information.

2.15 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Practice speaking and active listening skills.

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Modify communication to meet the needs of the patient/client and be appropriate to the situation.

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Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.21 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Apply employability skills in healthcare.

a. Chain of command

b. Correct grammar

c. Decision making

d. Flexible

e. Initiative

f. Integrity

g. Loyalty

h. Positive attitude

i. Professional characteristics

j. Prompt and prepared

k. Responsibility

l. Scope of practice

m. Teamwork

n. Willing to learn

8.12 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Identify characteristics of effective teams.

a. Active participation

b. Commitment

c. Common goals

d. Cultural sensitivity

e. Flexibility

f. Open to feedback

g. Positive attitude

h. Reliability

i. Trust

j. Value individual contributions

8.21 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Recognize methods for building positive team relationships (such as: mentorships and teambuilding).

8.22 Foundation Standard 8: Teamwork: Identify roles and responsibilities of individual members as part of the healthcare team.

Analyze attributes and attitudes of an effective leader.

a. Characteristics (interpersonal skills, focused on results, positive)

b. Types (autocratic, democratic, laissez faire)

c. Roles (sets vision, leads change, manages accountability)

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Apply effective techniques for managing team conflict (negotiation, assertive communication, gather the facts, clear expectations, mediation).

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Apply basic computer concepts and terminology necessary to use computers and other mobile devices.

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Demonstrate basic computer troubleshooting procedures (such as: restart, check power supply, refresh browser, check settings).

11.33 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Demonstrate use of file organization and information storage.

11.34 Foundation Standard 11: Information Technology Applications: Utilize and understand information technology applications common across health professions.

Identify uses of basic word processing, spreadsheet, and database applications.

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Evaluate validity of web-based resources.

Biomedical Innovation (BI)

National Health Science

Lesson 8.1

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Demonstrate competency in basic math skills and mathematical conversions as they relate to healthcare.

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Model verbal and nonverbal communication.

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Identify the differences between subjective and objective information.

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Practice speaking and active listening skills.

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Modify communication to meet the needs of the patient/client and be appropriate to the situation.

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Utilize proper elements of written and electronic communication (spelling, grammar, and formatting).

2.32 Foundation Standard 2: Communications: Demonstrate methods of delivering and obtaining information, while communicating effectively.

Prepare examples of technical, informative, and creative writing.

4.21 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Apply employability skills in healthcare.

a. Chain of command

b. Correct grammar

c. Decision making

d. Flexible

e. Initiative

f. Integrity

g. Loyalty

h. Positive attitude

i. Professional characteristics

j. Prompt and prepared

k. Responsibility

l. Scope of practice

m. Teamwork

n. Willing to learn

4.41 Foundation Standard 4: Employability Skills: Utilize employability skills to enhance employment opportunities and job satisfaction

Develop components of a personal portfolio.

a. Letter of introduction

b. Resume

c. Sample Projects

d. Writing Sample

e. Work-based Learning Documentation

f. Oral Report

g. Service Learning/Community Service

h. Credentials

i. Technology Skills

j. Leadership Examples

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Evaluate validity of web-based resources.

Biomedical Innovation (BI)

Next Generation Science Standards

Lesson 1.1

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.ETS1.1 - Engineering Design

Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

HS.ETS1.2 - Engineering Design

Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

HS.ETS1.3 - Engineering Design

Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

DCI - ETS1.A - Engineering Design - Defining and Delimiting Engineering Problems

Criteria and constraints also include satisfying any requirements set by society, such as taking issues of risk mitigation into account, and they should be quantified to the extent possible and stated in such a way that one can tell if a given design meets them. (secondary to HS-PS2-3)

DCI - ETS1.B - Engineering Design - Developing Possible Solutions

When evaluating solutions, it is important to take into account a range of constraints, including cost, safety , reliability , and aesthetics, and to consider social, cultural, and environmental impacts. (HS-ETS1-3)

DCI - ETS1.C - Engineering Design - Optimizing the Design Solution

Criteria may need to be broken down into simpler ones that can be approached systematically, and decisions about the priority of certain criteria over others (trade-offs) may be needed. (secondary to HS-PS1-6)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Asking questions and defining problems

Define a design problem that involves the development of a process or system with interacting components and criteria and constraints that may include social, technical, and/or environmental considerations.

Science and Engineering Practice - Developing and Using Models

Evaluate merits and limitations of two different models of the same proposed tool, process, mechanism or system in order to select or revise a model that best fits the evidence or design criteria.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Design, evaluate, and/or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Critically read scientific literature adapted for classroom use to determine the central ideas or conclusions and/or to obtain scientific and/or technical information to summarize complex evidence, concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Crosscutting Concepts - Systems and System Models

Systems can be designed to do specific tasks.

Biomedical Innovation (BI)

Next Generation Science Standards

Lesson 2.1

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.ETS1.2 - Engineering Design

Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

HS.ETS1.3 - Engineering Design

Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Asking questions and defining problems

Evaluate a question to determine if it is testable and relevant.

Science and Engineering Practice - Asking questions and defining problems

Ask questions that can be investigated within the scope of the school laboratory, research facilities, or field (e.g., outdoor environment) with available resources and, when appropriate, frame a hypothesis based on a model or theory.

Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan an investigation or test a design individually and collaboratively to produce data to serve as the basis for evidence as part of building and revising models, supporting explanations for phenomena, or testing solutions to problems. Consider possible confounding variables or effects and evaluate the investigation's design to ensure variables are controlled.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan and conduct an investigation or test a design solution in a safe and ethical manner including considerations of environmental, social, and personal impacts.

Science and Engineering Practice - Planning and Carrying Out Investigations

Select appropriate tools to collect, record, analyze, and evaluate data. Make directional hypotheses that specify what happens to a dependent variable when an independent variable is manipulated.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Analyzing and Interpreting Data

Apply concepts of statistics and probability (including determining function fits to data, slope, intercept, and correlation coefficient for linear fits) to scientific and engineering questions and problems, using digital tools when feasible.

Science and Engineering Practice - Analyzing and Interpreting Data

Consider limitations of data analysis (e.g., measurement error, sample selection) when analyzing and interpreting data.

Science and Engineering Practice - Analyzing and Interpreting Data

Compare and contrast various types of data sets (e.g., self-generated, archival) to examine consistency of measurements and observations.

Science and Engineering Practice - Using Mathematics and Computational Thinking

Use mathematical, computational, and/or algorithmic representations of phenomena or design solutions to describe and/or support claims and/or explanations.

Science and Engineering Practice - Using Mathematics and Computational Thinking

Apply techniques of algebra and functions to represent and solve scientific and engineering problems.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Make a quantitative and/or qualitative claim regarding the relationship between dependent and independent variables.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Engaging in Argument from Evidence

Evaluate the claims, evidence, and/or reasoning behind currently accepted explanations or solutions to determine the merits of arguments.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Critically read scientific literature adapted for classroom use to determine the central ideas or conclusions and/or to obtain scientific and/or technical information to summarize complex evidence, concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Crosscutting Concepts - Patterns

Mathematical representations are needed to identify some patterns.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Events have causes, sometimes simple, sometimes multifaceted. Deciphering causal relationships, and the mechanisms by which they are mediated, is a major activity of science and engineering.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Empirical evidence is required to differentiate between cause and correlation and make claims about specific causes and effects.

Crosscutting Concepts - Scale, Proportion, and Quantity

Algebraic thinking is used to examine scientific data and predict the effect of a change in one variable on another (e.g., linear growth vs. exponential growth).

Biomedical Innovation (BI)

Next Generation Science Standards

Lesson 3.1

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.ETS1.1 - Engineering Design

Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

HS.ETS1.2 - Engineering Design

Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

HS.ETS1.3 - Engineering Design

Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

DCI - ETS1.A - Engineering Design - Defining and Delimiting Engineering Problems

Criteria and constraints also include satisfying any requirements set by society, such as taking issues of risk mitigation into account, and they should be quantified to the extent possible and stated in such a way that one can tell if a given design meets them. (secondary to HS-PS2-3)

DCI - ETS1.A - Engineering Design - Defining and Delimiting Engineering Problems

Humanity faces major global challenges today, such as the need for supplies of clean water and food or for energy sources that minimize pollution, which can be addressed through engineering.

These global challenges also may have manifestations in local communities. (HS-ETS1-1)

DCI - ETS1.B - Engineering Design - Developing Possible Solutions

When evaluating solutions, it is important to take into account a range of constraints, including cost, safety , reliability , and aesthetics, and to consider social, cultural, and environmental impacts. (HS-ETS1-3)

DCI - ETS1.C - Engineering Design - Optimizing the Design Solution

Criteria may need to be broken down into simpler ones that can be approached systematically, and decisions about the priority of certain criteria over others (trade-offs) may be needed. (secondary to HS-PS1-6)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Asking questions and defining problems

Define a design problem that involves the development of a process or system with interacting components and criteria and constraints that may include social, technical, and/or environmental considerations.

Science and Engineering Practice - Developing and Using Models

Evaluate merits and limitations of two different models of the same proposed tool, process, mechanism or system in order to select or revise a model that best fits the evidence or design criteria.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan and conduct an investigation or test a design solution in a safe and ethical manner including considerations of environmental, social, and personal impacts.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data to identify design features or characteristics of the components of a proposed process or system to optimize it relative to criteria for success.

Science and Engineering Practice - Using Mathematics and Computational Thinking

Create and/or revise a computational model or simulation of a phenomenon, designed device, process, or system.

Science and Engineering Practice - Using Mathematics and Computational Thinking

Apply techniques of algebra and functions to represent and solve scientific and engineering problems.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Design, evaluate, and/or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Evaluate competing design solutions to a real-world problem based on scientific ideas and principles, empirical evidence, and/or logical arguments regarding relevant factors (e.g. economic, societal, environmental, ethical considerations).

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Critically read scientific literature adapted for classroom use to determine the central ideas or conclusions and/or to obtain scientific and/or technical information to summarize complex evidence, concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Crosscutting Concepts - Patterns

Patterns of performance of designed systems can be analyzed and interpreted to reengineer and improve the system.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Systems can be designed to cause a desired effect.

Crosscutting Concepts - Systems and System Models

Systems can be designed to do specific tasks.

Crosscutting Concepts - Structure and Function

The way an object is shaped or structured determines many of its properties and functions.

Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Biomedical Innovation (BI)

Next Generation Science Standards

Lesson 4.1

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.LS2.7 - Ecosystems: Interactions, Energy, and Dynamics

Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

HS.ETS1.1 - Engineering Design

Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

DCI - PS1.B - Matter and Its Interactions - Chemical Reactions

The fact that atoms are conserved, together with knowledge of the chemical properties of the elements involved, can be used to describe and predict chemical reactions. (HS-PS1-2), (HS-PS1-7)

DCI - LS2.C - Ecosystems: Interactions, Energy, and Dynamics - Ecosystem Dynamics, Functioning, and Resilience

Moreover, anthropogenic changes (induced by human activity) in the environment—including habitat destruction, pollution, introduction of invasive species, overexploitation, and climate change—can disrupt an ecosystem and threaten the survival of some species. (HS-LS2-7)

DCI - LS3.B - Heredity: Inheritance and Variation of Traits - Variation of Traits

Environmental factors also affect expression of traits, and hence affect the probability of occurrences of traits in a population. Thus the variation and distribution of traits observed depends on both genetic and environmental factors. (HS-LS3-2), (HS-LS3-3)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Critically read scientific literature adapted for classroom use to determine the central ideas or conclusions and/or to obtain scientific and/or technical information to summarize complex evidence, concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Biomedical Innovation (BI)

Next Generation Science Standards

Lesson 5.1

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

HS.LS1.3 - From Molecules to Organisms: Structures and Processes

Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

HS.ETS1.1 - Engineering Design

Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

HS.ETS1.3 - Engineering Design

Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Design, evaluate, and/or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Critically read scientific literature adapted for classroom use to determine the central ideas or conclusions and/or to obtain scientific and/or technical information to summarize complex evidence, concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Biomedical Innovation (BI)

Next Generation Science Standards

Lesson 6.1

HS.LS1.1 - From Molecules to Organisms: Structures and Processes

> Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

> Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

> All cells contain genetic information in the form of DNA molecules. Genes are regions in the DNA that contain the instructions that code for the formation of proteins, which carry out most of the work of cells. (HS-LS1-1), (Note: This Disciplinary Core Idea is also addressed by HS-LS3-1.)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

> Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

DCI - LS1.C - From Molecules to Organisms: Structures and Processes - Organization for Matter and Energy Flow in Organisms

> The sugar molecules thus formed contain carbon, hydrogen, and oxygen: their hydrocarbon backbones are used to make amino acids and other carbon-based molecules that can be assembled into larger molecules (such as proteins or DNA), used for example to form new cells. (HS-LS1-6)

DCI - LS3.A - Heredity: Inheritance and Variation of Traits - Inheritance of Traits

> Each chromosome consists of a single very long DNA molecule, and each gene on the chromosome is a particular segment of that DNA. The instructions for forming species' characteristics are carried in DNA. All cells in an organism have the same genetic content, but the genes used (expressed) by the cell may be regulated in different ways. Not all DNA codes for a protein; some segments of DNA are involved in regulatory or structural functions, and some have no as-yet known function. (HS-LS3-1)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Biomedical Innovation (BI)

Next Generation Science Standards

Lesson 7.1

HS.LS1.2 - From Molecules to Organisms: Structures and Processes

Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Systems of specialized cells within organisms help them perform the essential functions of life. (HS-LS1-1)

DCI - LS1.A - From Molecules to Organisms: Structures and Processes - Structure and Function

Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. (HS-LS1-2)

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or ideas (e.g., about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).

Crosscutting Concepts - Patterns

Observed patterns in nature guide organization and classification and prompt questions about relationships and causes underlying them.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Changes in systems may have various causes that may not have equal effects.

Crosscutting Concepts - Structure and Function

A system is an organized group of related objects or components; models can be used for understanding and predicting the behavior of systems.

Crosscutting Concepts - Structure and Function

The way an object is shaped or structured determines many of its properties and functions.

Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.

Biomedical Innovation (BI)

Next Generation Science Standards

Lesson 8.1

HS.ETS1.1 - Engineering Design

Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.

HS.ETS1.2 - Engineering Design

Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

HS.ETS1.3 - Engineering Design

Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

Science and Engineering Practice - Asking questions and defining problems

Ask questions

- that arise from careful observation of phenomena, or unexpected results, to clarify and/or seek additional information.

- that arise from examining models or a theory, to clarify and/or seek additional information and relationships.

- to determine relationships, including quantitative relationships, between independent and dependent variables.

- to clarify and refine a model, an explanation, or an engineering problem.

Science and Engineering Practice - Asking questions and defining problems

Evaluate a question to determine if it is testable and relevant.

Science and Engineering Practice - Asking questions and defining problems

Ask questions that can be investigated within the scope of the school laboratory, research facilities, or field (e.g., outdoor environment) with available resources and, when appropriate, frame a hypothesis based on a model or theory.

Science and Engineering Practice - Asking questions and defining problems

Ask and/or evaluate questions that challenge the premise(s) of an argument, the interpretation of a data set, or the suitability of a design.

Science and Engineering Practice - Asking questions and defining problems

Define a design problem that involves the development of a process or system with interacting components and criteria and constraints that may include social, technical, and/or environmental considerations.

Science and Engineering Practice - Developing and Using Models

Evaluate merits and limitations of two different models of the same proposed tool, process, mechanism or system in order to select or revise a model that best fits the evidence or design criteria.

Science and Engineering Practice - Developing and Using Models

Design a test of a model to ascertain its reliability.

Science and Engineering Practice - Developing and Using Models

Develop, revise, and/or use a model based on evidence to illustrate and/or predict the relationships between systems or between components of a system.

Science and Engineering Practice - Developing and Using Models

Develop and/or use multiple types of models to provide mechanistic accounts and/or predict phenomena, and move flexibly between model types based on merits and limitations.

Science and Engineering Practice - Developing and Using Models

Develop a complex model that allows for manipulation and testing of a proposed process or system.

Science and Engineering Practice - Developing and Using Models

Develop and/or use a model (including mathematical and computational) to generate data to support explanations, predict phenomena, analyze systems, and/or solve problems.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan an investigation or test a design individually and collaboratively to produce data to serve as the basis for evidence as part of building and revising models, supporting explanations for phenomena, or testing solutions to problems. Consider possible confounding variables or effects and evaluate the investigation's design to ensure variables are controlled.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly.

Science and Engineering Practice - Planning and Carrying Out Investigations

Plan and conduct an investigation or test a design solution in a safe and ethical manner including considerations of environmental, social, and personal impacts.

Science and Engineering Practice - Planning and Carrying Out Investigations

Select appropriate tools to collect, record, analyze, and evaluate data. Make directional hypotheses that specify what happens to a dependent variable when an independent variable is manipulated.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data using tools, technologies, and/or models (e.g., computational, mathematical) in order to make valid and reliable scientific claims or determine an optimal design solution.

Science and Engineering Practice - Analyzing and Interpreting Data

Apply concepts of statistics and probability (including determining function fits to data, slope, intercept, and correlation coefficient for linear fits) to scientific and engineering questions and problems, using digital tools when feasible.

Science and Engineering Practice - Analyzing and Interpreting Data

Consider limitations of data analysis (e.g., measurement error, sample selection) when analyzing and interpreting data.

Science and Engineering Practice - Analyzing and Interpreting Data

Compare and contrast various types of data sets (e.g., self-generated, archival) to examine consistency of measurements and observations.

Science and Engineering Practice - Analyzing and Interpreting Data

Analyze data to identify design features or characteristics of the components of a proposed process or system to optimize it relative to criteria for success.

Science and Engineering Practice - Using Mathematics and Computational Thinking

Create and/or revise a computational model or simulation of a phenomenon, designed device, process, or system.

Science and Engineering Practice - Using Mathematics and Computational Thinking

Use mathematical, computational, and/or algorithmic representations of phenomena or design solutions to describe and/or support claims and/or explanations.

Science and Engineering Practice - Using Mathematics and Computational Thinking

Apply techniques of algebra and functions to represent and solve scientific and engineering problems.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Make a quantitative and/or qualitative claim regarding the relationship between dependent and independent variables.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Construct and revise an explanation based on valid and reliable evidence obtained from a variety of sources (including students' own investigations, models, theories, simulations, peer review) and the assumption that theories and

laws that describe the natural world operate today as they did in the past and will continue to do so in the future.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific ideas, principles, and/or evidence to provide an explanation of phenomena and solve design problems, taking into account possible unanticipated effects.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Apply scientific reasoning, theory, and/or models to link evidence to the claims to assess the extent to which the reasoning and data support the explanation or conclusion.

Science and Engineering Practice - Constructing Explanations and Designing Solutions

Design, evaluate, and/or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

Science and Engineering Practice - Engaging in Argument from Evidence

Construct, use, and/or present an oral and written argument or counterarguments based on data and evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Make and defend a claim based on evidence about the natural world or the effectiveness of a design solution that reflects scientific knowledge and student-generated evidence.

Science and Engineering Practice - Engaging in Argument from Evidence

Evaluate competing design solutions to a real-world problem based on scientific ideas and principles, empirical evidence, and/or logical arguments regarding relevant factors (e.g. economic, societal, environmental, ethical considerations).

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Critically read scientific literature adapted for classroom use to determine the central ideas or conclusions and/or to obtain scientific and/or technical information to summarize complex evidence, concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Gather, read, and evaluate scientific and/or technical information from multiple authoritative sources, assessing the evidence and usefulness of each source.

Science and Engineering Practice - Obtaining, Evaluating, and Communicating Information

Evaluate the validity and reliability of and/or synthesize multiple claims, methods, and/or designs that appear in scientific and technical texts or media reports, verifying the data when possible. Communicate scientific and/or technical information or id

Crosscutting Concepts - Patterns

Patterns of performance of designed systems can be analyzed and interpreted to reengineer and improve the system.

Crosscutting Concepts - Cause and Effect: Mechanism and Prediction

Systems can be designed to cause a desired effect.

Crosscutting Concepts - Scale, Proportion, and Quantity

Algebraic thinking is used to examine scientific data and predict the effect of a change in one variable on another (e.g., linear growth vs. exponential growth).

Crosscutting Concepts - Systems and System Models

Systems can be designed to do specific tasks.

Crosscutting Concepts - Systems and System Models

Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales.

Crosscutting Concepts - Structure and Function

The way an object is shaped or structured determines many of its properties and functions.

Crosscutting Concepts - Structure and Function

The functions and properties of natural and designed objects and systems can be inferred from their overall structure, the way their components are shaped and used, and the molecular substructures of its various materials.