



Manufacturing Career Cluster Health, Safety and Environmental Assurance Pathway Knowledge and Skill Statements

The Pathway Knowledge and Skills Chart describes what all/most learners/workers need to know and be able to do to demonstrate competence within a career pathway. Following the pathway description, there are four sets of knowledge and skill expectations:

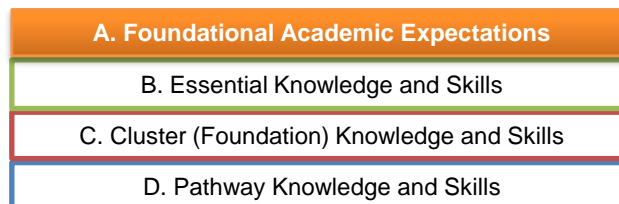


PATHWAY DESCRIPTION

Health, Safety and Environmental Assurance Pathway: Employees in Health, Safety and Environmental Assurance ensure that the equipment is being used safely in the workplace; plan for safety in new production processes; conduct health, safety and/or environmental incident and hazard investigations; conduct preventive health, safety and/or environmental incident and hazard inspections; and implement health, safety and/or environmental programs, projects, policies or procedures. They may train workers in health, safety and/or environmental issues and provide event documentation.

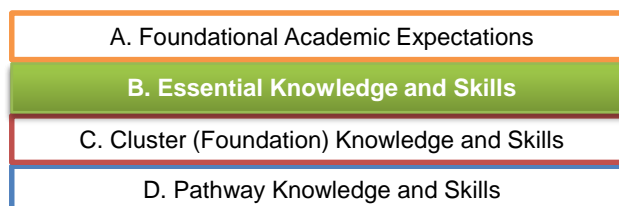
A. FOUNDATIONAL ACADEMIC EXPECTATIONS

All secondary students should meet their state's academic standards. All Essential Cluster and Pathway Knowledge and Skills are predicated on the assumption that foundational academic skills have been attained. Some knowledge and skill statements will further define critical linkages and applications of academics in the cluster and/or pathway.



B. ESSENTIAL KNOWLEDGE AND SKILLS

The following Essential Knowledge and Skill statements apply to careers in all clusters and pathways. Persons preparing for careers in this pathway should be able to demonstrate these skills in the context of this cluster and pathway.





Manufacturing Career Cluster
Health, Safety and Environmental Assurance Pathway
Knowledge and Skill Statements

Essential Topic **ACADEMIC FOUNDATIONS: *Achieve additional academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within a career cluster.***
ESS01

ESS01.01 **Complete required training, education, and certification to prepare for employment in a particular career field.**

- ESS01.01.01 Identify training, education and certification requirements for occupational choice.
- ESS01.01.02 Participate in career-related training and/or degree programs.
- ESS01.01.03 Pass certification tests to qualify for licensure and/or certification in chosen occupational area.

ESS01.02 **Demonstrate language arts knowledge and skills required to pursue the full range of post-secondary education and career opportunities.**

- ESS01.02.01 Model behaviors that demonstrate active listening.
- ESS01.02.02 Adapt language for audience, purpose, situation. (i.e. diction/structure, style).
- ESS01.02.03 Organize oral and written information.
- ESS01.02.04 Compose focused copy for a variety of written documents such as agendas, audio-visuals, bibliographies, drafts, forms/documents, notes, oral presentations, reports, and technical terminology.
- ESS01.02.05 Edit copy to create focused written documents such as agendas, audio-visuals, bibliographies, drafts, forms/documents, notes, oral presentations, reports, and technical terminology.
- ESS01.02.06 Comprehend key elements of oral and written information such as cause/effect, comparisons/contrasts, conclusions, context, purpose, charts/tables/graphs, evaluation/critiques, mood, persuasive text, sequence, summaries, and technical subject matter.
- ESS01.02.07 Evaluate oral and written information for accuracy, adequacy/sufficiency, appropriateness, clarity, conclusions/solutions, fact/opinion, propaganda, relevancy, validity, and relationship of ideas.
- ESS01.02.08 Identify assumptions, purpose, outcomes/solutions, and propaganda techniques.
- ESS01.02.09 Predict potential outcomes and/or solutions based on oral and written information regarding trends.
- ESS01.02.10 Present formal and informal speeches including discussion, information requests, interpretation, and persuasive arguments.

ESS01.03 **Demonstrate mathematics knowledge and skills required to pursue the full range of post-secondary education and career opportunities.**

- ESS01.03.01 Identify whole numbers, decimals, and fractions.
- ESS01.03.02 Demonstrate knowledge of basic arithmetic operations such as addition, subtraction, multiplication, and division.
- ESS01.03.03 Demonstrate use of relational expressions such as equal to, not equal, greater than, less than, etc.
- ESS01.03.04 Apply data and measurements to solve a problem.



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- ESS01.03.05 Analyze Mathematical problem statements for missing and/or irrelevant data.
- ESS01.03.06 Construct charts/tables/graphs from functions and data.
- ESS01.03.07 Analyze data when interpreting operational documents.

ESS01.04 Demonstrate science knowledge and skills required to pursue the full range of post-secondary and career education opportunities.

- ESS01.04.01 Evaluate scientific constructs including conclusions, conflicting data, controls, data, inferences, limitations, questions, sources of errors, and variables.
- ESS01.04.02 Apply scientific methods in qualitative and quantitative analysis, data gathering, direct and indirect observation, predictions, and problem identification.

Essential Topic ESS02 COMMUNICATIONS: Use oral and written communication skills in creating, expressing and interpreting information and ideas including technical terminology and information.

ESS02.01 Select and employ appropriate reading and communication strategies to learn and use technical concepts and vocabulary in practice.

- ESS02.01.01 Determine the most appropriate reading strategy for identifying the overarching purpose of a text (i.e. skimming, reading for detail, reading for meaning or critical analysis).
- ESS02.01.02 Demonstrate use of content, technical concepts and vocabulary when analyzing information and following directions.
- ESS02.01.03 Select the reading strategy or strategies needed to fully comprehend the content within a written document (i.e., skimming, reading for detail, reading for meaning or critical analysis).
- ESS02.01.04 Interpret information, data, and observations to apply information learned from reading to actual practice.
- ESS02.01.05 Transcribe information, data, and observations to apply information learned from reading to actual practice.
- ESS02.01.06 Communicate information, data, and observations to apply information learned from reading to actual practice.

ESS02.02 Demonstrate use of the concepts, strategies, and systems for obtaining and conveying ideas and information to enhance communication in the workplace.

- ESS02.02.01 Employ verbal skills when obtaining and conveying information.
- ESS02.02.02 Record information needed to present a report on a given topic or problem.
- ESS02.02.03 Write internal and external business correspondence that conveys and/or obtains information effectively.
- ESS02.02.04 Communicate with other employees to clarify workplace objectives.
- ESS02.02.05 Communicate effectively with customers and employees to foster positive relationships.



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ESS02.03 Locate, organize and reference written information from various sources to communicate with co-workers and clients/participants.

- ESS02.03.01 Locate written information used to communicate with co-workers and customers.
- ESS02.03.02 Organize information to use in written and oral communications.
- ESS02.03.03 Reference the sources of information.

ESS02.04 Evaluate and use information resources to accomplish specific occupational tasks.

- ESS02.04.01 Use informational texts, Internet web sites, and/or technical materials to review and apply information sources for occupational tasks.
- ESS02.04.02 Evaluate the reliability of information from informational texts, Internet Web sites, and/or technical materials and resources.

ESS02.05 Use correct grammar, punctuation and terminology to write and edit documents.

- ESS02.05.01 Compose multi-paragraph documents clearly, succinctly, and accurately.
- ESS02.05.02 Use descriptions of audience and purpose when preparing and editing written documents.
- ESS02.05.03 Use correct grammar, spelling, punctuation, and capitalization when preparing written documents.

ESS02.06 Develop and deliver formal and informal presentations using appropriate media to engage and inform audiences.

- ESS02.06.01 Prepare oral presentations to provide information for specific purposes and audiences.
- ESS02.06.02 Identify support materials that will enhance an oral presentation.
- ESS02.06.03 Prepare support materials that will enhance an oral presentation.
- ESS02.06.04 Deliver an oral presentation that sustains listeners' attention and interest.
- ESS02.06.05 Align presentation strategies to the intended audience.
- ESS02.06.06 Implement multi-media strategies for presentations.

ESS02.07 Interpret verbal and nonverbal cues/behaviors to enhance communication with co-workers and clients/participants.

- ESS02.07.01 Interpret verbal behaviors when communicating with clients and co-workers.
- ESS02.07.02 Interpret nonverbal behaviors when communicating with clients and co-workers.

ESS02.08 Apply active listening skills to obtain and clarify information.

- ESS02.08.01 Interpret a given verbal message/information.
- ESS02.08.02 Respond with restatement and clarification techniques to clarify information.

ESS02.09 Develop and interpret tables, charts, and figures to support written and oral communications.



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- ESS02.09.01 Create tables, charts, and figures to support written and oral communications.
- ESS02.09.02 Interpret tables, charts, and figures used to support written and oral communication.

ESS02.10 Listen to and speak with diverse individuals to enhance communication skills.

- ESS02.10.01 Apply factors and strategies for communicating with a diverse workforce.
- ESS02.10.02 Demonstrate ability to communicate and resolve conflicts within a diverse workforce.

ESS02.11 Exhibit public relations skills to increase internal and external customer/client satisfaction.

- ESS02.11.01 Communicate effectively when developing positive customer/client relationships.

Essential Topic ESS03 PROBLEM-SOLVING AND CRITICAL THINKING: *Solve problems using critical thinking skills (analyze, synthesize, and evaluate) independently and in teams. Solve problems using creativity and innovation.*

ESS03.01 Employ critical thinking skills independently and in teams to solve problems and make decisions (e.g., analyze, synthesize and evaluate).

- ESS03.01.01 Identify common tasks that require employees to use problem-solving skills.
- ESS03.01.02 Analyze elements of a problem to develop creative solutions.
- ESS03.01.03 Describe the value of using problem-solving and critical thinking skills to improve a situation or process.
- ESS03.01.04 Create ideas, proposals, and solutions to problems.
- ESS03.01.05 Evaluate ideas, proposals, and solutions to problems.
- ESS03.01.06 Use structured problem-solving methods when developing proposals and solutions.
- ESS03.01.07 Generate new and creative ideas to solve problems by brainstorming possible solutions.
- ESS03.01.08 Critically analyze information to determine value to the problem-solving task.
- ESS03.01.09 Guide individuals through the process of recognizing concerns and making informed decisions.
- ESS03.01.10 Identify alternatives using a variety of problem-solving and critical thinking skills.
- ESS03.01.11 Evaluate alternatives using a variety of problem-solving and critical thinking skills.

ESS03.02 Employ critical thinking and interpersonal skills to resolve conflicts with staff and/or customers.

- ESS03.02.01 Analyze situations and behaviors that affect conflict management.
- ESS03.02.02 Determine best options/outcomes for conflict resolution using critical thinking skills.



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- ESS03.02.03 Identify with others' feelings, needs, and concerns.
- ESS03.02.04 Implement stress management techniques.
- ESS03.02.05 Resolve conflicts with/for customers using conflict resolution skills.
- ESS03.02.06 Implement conflict resolution skills to address staff issues/problems.

ESS03.03 Identify, write and monitor workplace performance goals to guide progress in assigned areas of responsibility and accountability.

- ESS03.03.01 Write realistic performance goals, objectives and action plans.
- ESS03.03.02 Monitor performance goals and adjust as necessary.
- ESS03.03.03 Recognize goal achievement using appropriate rewards in the workplace.

ESS03.04 Conduct technical research to gather information necessary for decision-making.

- ESS03.04.01 Align the information gathered to the needs of the audience.
- ESS03.04.02 Gather technical information and data using a variety of resources.
- ESS03.04.03 Analyze information and data for value to the research objectives.
- ESS03.04.04 Evaluate information and data to determine value to research objectives.

Essential Topic
ESS04

INFORMATION TECHNOLOGY APPLICATIONS: *Use information technology tools specific to the career cluster to access, manage, integrate, and create information.*

ESS04.01 Use Personal Information Management (PIM) applications to increase workplace efficiency.

- ESS04.01.01 Manage personal schedules and contact information.
- ESS04.01.02 Create memos and notes.

ESS04.02 Employ technological tools to expedite workflow.

- ESS04.02.01 Use information technology tools to manage and perform work responsibilities.

ESS04.03 Operate electronic mail applications to communicate within a workplace.

- ESS04.03.01 Use email to share files and documents.
- ESS04.03.02 Identify the functions and purpose of email systems.
- ESS04.03.03 Use email to communicate within and across organizations.

ESS04.04 Operate Internet applications to perform workplace tasks.

- ESS04.04.01 Access and navigate Internet (e.g., use a web browser).
- ESS04.04.02 Search for information and resources.
- ESS04.04.03 Evaluate Internet resources for reliability and validity.

ESS04.05 Operate writing and publishing applications to prepare business communications.

- ESS04.05.01 Prepare simple documents and other business communications.
- ESS04.05.02 Prepare reports and other business communications by integrating graphics and other non-text elements.



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ESS04.05.03	Prepare complex multi-media publications.
ESS04.06	Operate presentation applications to prepare presentations.
ESS04.06.01	Prepare presentations for training, sales and information sharing.
ESS04.06.02	Deliver presentations with supporting materials.
ESS04.07	Employ spreadsheet applications to organize and manipulate data.
ESS04.07.01	Create a spreadsheet.
ESS04.07.02	Perform calculations and analyses on data using a spreadsheet.
ESS04.08	Employ database applications to manage data.
ESS04.08.01	Manipulate data elements.
ESS04.08.02	Manage interrelated data elements.
ESS04.08.03	Analyze interrelated data elements.
ESS04.08.04	Generate reports showing interrelated data elements.
ESS04.09	Employ collaborative/groupware applications to facilitate group work.
ESS04.09.01	Facilitate group work through management of shared schedule and contact information.
ESS04.09.02	Facilitate group work through management of shared files and online information.
ESS04.09.03	Facilitate group work through instant messaging or virtual meetings.
ESS04.10	Employ computer operations applications to manage work tasks.
ESS04.10.01	Manage computer operations.
ESS04.10.02	Manage file storage.
ESS04.10.03	Compress or alter files.
ESS04.11	Use computer-based equipment (containing embedded computers or processors) to control devices.
ESS04.11.01	Operate computer driven equipment and machines.
ESS04.11.02	Use installation and operation manuals.
ESS04.11.03	Troubleshoot computer driven equipment and machines.
ESS04.11.04	Access support as needed to maintain operation of computer driven equipment and machines.

Essential Topic
ESS05

SYSTEMS: *Understand roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. Identify how key organizational systems affect organizational performance and the quality of products and services. Understand global context of industries and careers.*

ESS05.01	Describe the nature and types of business organizations to build an understanding of the scope of organizations.
ESS05.01.01	List the types and functions of businesses.
ESS05.01.02	Describe the types and functions of businesses.
ESS05.01.03	Explain the functions and interactions of common departments within a business.



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ESS05.02 Implement quality control systems and practices to ensure quality products and services.

ESS05.02.01 Describe quality control standards and practices common to the workplace.

Essential Topic
ESS06

SAFETY, HEALTH AND ENVIRONMENTAL: *Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. Follow organizational policies and procedures and contribute to continuous improvement in performance and compliance.*

ESS06.01 Implement personal and jobsite safety rules and regulations to maintain safe and healthful working conditions and environments.

- ESS06.01.01 Assess workplace conditions with regard to safety and health.
- ESS06.01.02 Align safety issues with appropriate safety standards to ensure a safe workplace/jobsite.
- ESS06.01.03 Identify safety hazards common to workplaces.
- ESS06.01.04 Identify safety precautions to maintain a safe worksite.
- ESS06.01.05 Select appropriate personal protective equipment as needed for a safe workplace/jobsite.
- ESS06.01.06 Inspect personal protective equipment commonly used for selected career pathway.
- ESS06.01.07 Use personal protective equipment according to manufacturer rules and regulations.
- ESS06.01.08 Employ a safety hierarchy and communication system within the workplace/jobsite.
- ESS06.01.09 Implement safety precautions to maintain a safe worksite.

ESS06.02 Complete work tasks in accordance with employee rights and responsibilities and employers obligations to maintain workplace safety and health.

- ESS06.02.01 Identify rules and laws designed to promote safety and health in the workplace.
- ESS06.02.02 State the rationale of rules and laws designed to promote safety and health.

ESS06.03 Employ emergency procedures as necessary to provide aid in workplace accidents.

- ESS06.03.01 Use knowledge of First Aid procedures as necessary.
- ESS06.03.02 Use knowledge of CPR procedures as necessary.
- ESS06.03.03 Use safety equipment as necessary.

ESS06.04 Employ knowledge of response techniques to create a disaster and/or emergency response plan.

- ESS06.04.01 Complete an assessment of an emergency and/or disaster situation.
- ESS06.04.02 Create an emergency and/or disaster plan.



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Essential Topic ESS07	LEADERSHIP AND TEAMWORK: <i>Use leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.</i>
ESS07.01	Employ leadership skills to accomplish organizational goals and objectives.
ESS07.01.01	Analyze the various roles of leaders within organizations (e.g. contribute ideas; share in building an organization; act as role models to employees by adhering to company policies, procedures, and standards; promote the organization's vision; and mentor others).
ESS07.01.02	Exhibit traits such as empowerment, risk, communication, focusing on results, decision-making, problem solution, and investment in individuals when leading a group in solving a problem.
ESS07.01.03	Exhibit traits such as compassion, service, listening, coaching, developing others, team development, and understanding and appreciating others when acting as a manager of others in the workplace.
ESS07.01.04	Exhibit traits such as enthusiasm, creativity, conviction, mission, courage, concept, focus, principle-centered living, and change when interacting with others in general.
ESS07.01.05	Consider issues related to self, team, community, diversity, environment, and global awareness when leading others.
ESS07.01.06	Exhibit traits such as innovation, intuition, adaptation, life-long learning and coachability to develop leadership potential over time.
ESS07.01.07	Analyze leadership in relation to trust, positive attitude, integrity, and willingness to accept key responsibilities in a work situation.
ESS07.01.08	Describe observations of outstanding leaders using effective management styles.
ESS07.01.09	Participate in civic and community leadership and teamwork opportunities to enhance skills.
ESS07.02	Employ organizational and staff development skills to foster positive working relationships and accomplish organizational goals.
ESS07.02.01	Implement organizational skills when facilitating others' work efforts.
ESS07.02.02	Explain how to manage a staff that satisfies work demands while adhering to budget constraints.
ESS07.02.03	Describe how staff growth and development to increase productivity and employee satisfaction.
ESS07.02.04	Organize team involvement within a group environment.
ESS07.02.05	Work with others to develop and gain commitment to team goals.
ESS07.02.06	Distribute responsibility and work load fairly.
ESS07.02.07	Model leadership and teamwork qualities to aid in employee morale.
ESS07.02.08	Identify best practices for successful team functioning.
ESS07.02.09	Explain best practices for successful team functioning.
ESS07.03	Employ teamwork skills to achieve collective goals and use team members' talents effectively.



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- ESS07.03.01 Work with others to achieve objectives in a timely manner.
- ESS07.03.02 Promote the full involvement and use of team members' individual talents and skills.
- ESS07.03.03 Employ conflict-management skills to facilitate solutions.
- ESS07.03.04 Demonstrate teamwork skills through working cooperatively with co-workers, supervisory staff, and others, both in and out of the organization, to achieve particular tasks.
- ESS07.03.05 Demonstrate teamwork processes that provide team building, consensus, continuous improvement, respect for the opinions of others, cooperation, adaptability, and conflict resolution.
- ESS07.03.06 Develop plans to improve team performance.
- ESS07.03.07 Demonstrate commitment to and a positive attitude toward team goals.
- ESS07.03.08 Take responsibility for shared group and individual work tasks.
- ESS07.03.09 Assist team members in completing their work.
- ESS07.03.10 Adapt effectively to changes in projects and work activities.
- ESS07.03.11 Negotiate effectively to arrive at decisions.

ESS07.04 Establish and maintain effective working relationships with all levels of personnel and other departments in order to accomplish objectives and tasks.

- ESS07.04.01 Build effective working relationships using interpersonal skills.
- ESS07.04.02 Use positive interpersonal skills to work cooperatively with co-workers representing different cultures, genders and backgrounds.
- ESS07.04.03 Manage personal skills to accomplish assignments.
- ESS07.04.04 Treat people with respect.
- ESS07.04.05 Provide constructive praise and criticism.
- ESS07.04.06 Demonstrate sensitivity to and value for diversity.
- ESS07.04.07 Manage stress and control emotions.

ESS07.05 Conduct and participate in meetings to accomplish work tasks.

- ESS07.05.01 Develop meeting goals, objectives and agenda.
- ESS07.05.02 Assign responsibilities for preparing materials and leading discussions.
- ESS07.05.03 Prepare materials for leading discussion.
- ESS07.05.04 Assemble and distribute meeting materials.
- ESS07.05.05 Conduct meeting to achieve objectives within scheduled time.
- ESS07.05.06 Demonstrate effective communication skills in meetings.
- ESS07.05.07 Produce meeting minutes including decisions and next steps.
- ESS07.05.08 Use parliamentary procedure, as needed, to conduct meetings.

ESS07.06 Employ mentoring skills to inspire and teach others.

- ESS07.06.01 Use motivational techniques to enhance performance in others.
- ESS07.06.02 Provide guidance to enhance performance in others.

Essential Topic ESS08 ETHICS AND LEGAL RESPONSIBILITIES: *Know and understand the importance of professional ethics and legal responsibilities.*

ESS08.01 Apply ethical reasoning to a variety of workplace situations in order to make ethical decisions.



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- ESS08.01.01 Evaluate alternative responses to workplace situations based on legal responsibilities and employer policies.
- ESS08.01.02 Evaluate alternative responses to workplace situations based on personal or professional ethical responsibilities.
- ESS08.01.03 Identify personal and long-term workplace consequences of unethical or illegal behaviors.
- ESS08.01.04 Explain personal and long-term workplace consequences of unethical or illegal behaviors.
- ESS08.01.05 Determine the most appropriate response to workplace situations based on legal and ethical considerations.
- ESS08.01.06 Explain the most appropriate response to workplace situations based on legal and ethical considerations.

ESS08.02 Interpret and explain written organizational policies and procedures to help employees perform their jobs according to employer rules and expectations.

- ESS08.02.01 Locate information on organizational policies in handbooks and manuals.
- ESS08.02.02 Discuss how specific organizational policies and procedures influence a specific work situation.

Essential Topic
ESS09

EMPLOYABILITY AND CAREER DEVELOPMENT: *Know and understand the importance of employability skills. Explore, plan, and effectively manage careers. Know and understand the importance of entrepreneurship skills.*

ESS09.01 Identify and demonstrate positive work behaviors and personal qualities needed to be employable.

- ESS09.01.01 Demonstrate self-discipline, self-worth, positive attitude, and integrity in a work situation.
- ESS09.01.02 Demonstrate flexibility and willingness to learn new knowledge and skills.
- ESS09.01.03 Exhibit commitment to the organization.
- ESS09.01.04 Identify how work varies with regard to site, from indoor confined spaces to outdoor areas, including aerial space and a variety of climatic and physical conditions.
- ESS09.01.05 Apply communication strategies when adapting to a culturally diverse environment.
- ESS09.01.06 Manage resources in relation to the position (i.e. budget, supplies, computer, etc).
- ESS09.01.07 Identify positive work-qualities typically desired in each of the career cluster's pathways.
- ESS09.01.08 Manage work roles and responsibilities to balance them with other life roles and responsibilities.

ESS09.02 Develop a personal career plan to meet career goals and objectives.



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ESS09.02.01 Develop career goals and objectives as part of a plan for future career direction.

ESS09.02.02 Develop strategies to reach career objectives.

ESS09.03 Demonstrate skills related to seeking and applying for employment to find and obtain a desired job.

ESS09.03.01 Use multiple resources to locate job opportunities.

ESS09.03.02 Prepare a résumé.

ESS09.03.03 Prepare a letter of application.

ESS09.03.04 Complete an employment application.

ESS09.03.05 Interview for employment.

ESS09.03.06 List the standards and qualifications that must be met in order to enter a given industry.

ESS09.03.07 Employ critical thinking and decision-making skills to exhibit qualifications to a potential employer.

ESS09.04 Maintain a career portfolio to document knowledge, skills and experience in a career field.

ESS09.04.01 Select educational and work history highlights to include in a career portfolio.

ESS09.04.02 Produce a record of work experiences, licenses, certifications and products.

ESS09.04.03 Organize electronic or physical portfolio for use in demonstrating knowledge, skills and experiences.

ESS09.05 Demonstrate skills in evaluating and comparing employment opportunities in order to accept employment positions that match career goals.

ESS09.05.01 Compare employment opportunities to individual needs and career plan objectives.

ESS09.05.02 Evaluate employment opportunities based upon individual needs and career plan objectives.

ESS09.05.03 Demonstrate appropriate methods for accepting or rejecting employment offers.

ESS09.06 Identify and exhibit traits for retaining employment to maintain employment once secured.

ESS09.06.01 Model behaviors that demonstrate reliability and dependability.

ESS09.06.02 Maintain appropriate dress and behavior for the job to contribute to a safe and effective workplace/jobsite.

ESS09.06.03 Complete required employment forms and documentation such as I-9 form, work visa, W-4 and licensures to meet employment requirements.

ESS09.06.04 Summarize key activities necessary to retain a job in the industry.

ESS09.06.05 Identify positive work behaviors and personal qualities necessary to retain employment.



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ESS09.07 Identify and explore career opportunities in one or more career pathways to build an understanding of the opportunities available in the cluster.

ESS09.07.01 Locate and identify career opportunities that appeal to personal career goals.

ESS09.07.02 Match personal interest and aptitudes to selected careers.

ESS09.08 Recognize and act upon requirements for career advancement to plan for continuing education and training.

ESS09.08.01 Identify opportunities for career advancement.

ESS09.08.02 Pursue education and training opportunities to acquire skills necessary for career advancement.

ESS09.08.03 Examine the organization and structure of various segments of the industry to prepare for career advancement.

ESS09.08.04 Research local and regional labor (workforce) market and job growth information to project potential for advancement.

ESS09.08.05 Manage employment relations to make career advancements.

ESS09.09 Continue professional development to keep current on relevant trends and information within the industry.

ESS09.09.01 Use self assessment, organizational priorities, journals, Internet sites, professional associations, peers and other resources to develop goals that address training, education and self-improvement issues.

ESS09.09.02 Read trade magazines and journals, manufacturers' catalogues, industry publications and Internet sites to keep current on industry trends.

ESS09.09.03 Participate in relevant conferences, workshops, mentoring activities and in-service training to stay current with recent changes in the field.

ESS09.10 Examine licensing, certification and credentialing requirements at the national, state and local levels to maintain compliance with industry requirements.

ESS09.10.01 Examine continuing education requirements related to licensing, certification, and credentialing requirements at the local, state and national levels for chosen occupation.

ESS09.10.02 Examine the procedures and paperwork involved in maintaining and updating licensure, certification and credentials for chosen occupation.

ESS09.10.03 Align ongoing licensing, certification and credentialing requirements to career plans and goals.

ESS09.11 Examine employment opportunities in entrepreneurship to consider entrepreneurship as an option for career planning.

ESS09.11.01 Describe the opportunities for entrepreneurship in a given industry.

Essential Topic
ESS10

TECHNICAL SKILLS: *Use of technical knowledge and skills required to pursue careers in all career cluster, including knowledge of design, operation, and maintenance of technological systems critical to the career cluster.*



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ESS10.01 Employ information management techniques and strategies in the workplace to assist in decision-making.

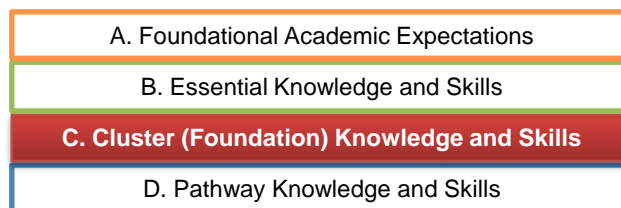
- ESS10.01.01 Use information literacy skills when accessing, evaluating and disseminating information.
- ESS10.01.02 Describe the nature and scope of information management.
- ESS10.01.03 Maintain records to facilitate ongoing business operations.

ESS10.02 Employ planning and time management skills and tools to enhance results and complete work tasks.

- ESS10.02.01 Develop goals and objectives.
- ESS10.02.02 Prioritize tasks to be completed.
- ESS10.02.03 Develop timelines using time management knowledge and skills.
- ESS10.02.04 Use project-management skills to improve workflow and minimize costs.

C. CLUSTER (FOUNDATION) KNOWLEDGE AND SKILLS

The following Cluster (Foundation) Knowledge and Skill statements apply to all careers in the Manufacturing Cluster. Persons preparing for careers in the Manufacturing Cluster should be able to demonstrate these skills in addition to those found on the Essential Knowledge and Skills Chart.



Cluster Topic MNC01 **ACADEMIC FOUNDATIONS:** *Achieve additional academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within a career cluster.*
No additional statements in this topic beyond those found in the Essential Knowledge and Skills Chart.

Cluster Topic MNC02 **COMMUNICATIONS:** *Use oral and written communication skills in creating, expressing and interpreting information and ideas including technical terminology and information.*
No additional statements in this topic beyond those found in the Essential Knowledge and Skills Chart.

Cluster Topic MNC03 **PROBLEM-SOLVING AND CRITICAL THINKING:** *Solve problems using critical thinking skills (analyze, synthesize, and evaluate) independently and in teams. Solve problems using creativity and innovation.*
No additional statements in this topic beyond those found in the Essential Knowledge and Skills Chart.

Cluster Topic MNC04 **INFORMATION TECHNOLOGY APPLICATIONS:** *Use information technology tools specific to the career cluster to access, manage, integrate, and create information.*



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No additional statements in this topic beyond those found in the Essential Knowledge and Skills Chart.

Cluster Topic	SYSTEMS: Understand roles within teams, work units, departments, organizations, inter-organizational systems, and the larger environment. Identify how key organizational systems affect organizational performance and the quality of products and services. Understand global context of industries and careers.
MNC05	
MNC05.01	Summarize and explain how manufacturing businesses operate to demonstrate an understanding of key functions within organizations in the industry.
MNC05.01.01	Identify the role and major functions of manufacturing businesses.
<i>Sample Indicators</i>	Explain the importance of manufacturing to society. Identify the mission, major internal functions and structure of manufacturing businesses. Identify the customers, suppliers, and stakeholders of manufacturing businesses, their roles, and how they relate.
	Explain the major competitive challenges faced by the manufacturing businesses. Identify and describe types of manufacturing systems. Analyze current trends in manufacturing systems.
MNC05.01.02	Describe how manufacturing businesses manage performance.
<i>Sample Indicators</i>	Explain how financial performance is measured. Explain how market performance is gauged. Explain how service and internal operations performance is determined. Explain how compliance and performance related to health, safety, and environment are evaluated.
MNC05.01.03	Describe how changes outside the manufacturing business impact the manufacturing business.
<i>Sample Indicators</i>	Explain the impact of economic changes. Explain the impact of social changes. Explain the impact of technology changes.
MNC05.01.04	Explain the role of risk management in reducing risks and improving performance in manufacturing businesses.
<i>Sample Indicators</i>	Explain the objectives of risk management programs. Explain the major types of loss exposure for manufacturing businesses. Explain the approaches for managing organizational risks.
MNC05.01.05	Identify the roles and functions of government in regulating and supporting manufacturing businesses.
<i>Sample Indicators</i>	Explain the roles in regulating domestic operations. Explain the roles in regulating international operations. Explain the roles in managing the infrastructures of manufacturing businesses. Explain the roles in health, safety, and environmental management.
MNC05.02	Analyze and summarize how manufacturing businesses improve performance to demonstrate an understanding of various methods for enhancing production.
MNC05.02.01	Describe how manufacturing businesses manage customer relationships.



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<i>Sample Indicators</i>	Identify needs and requirements of internal and external customers. Describe customer satisfaction and fulfillment of customer requirements.
MNC05.02.02	Explain how manufacturing businesses respond to customer problems and complaints. Describe how planning and budgeting are used to accomplish organizational goals and objectives.
<i>Sample Indicators</i>	Explain how work plans and budgets are used to allocate people and resources. Identify reports used to track performance and resource and explain how they are used.
MNC05.02.03	Explain how plans and budgets are revised to meet goals and objectives. Explain how planning is used to improve overall business performance.
<i>Sample Indicators</i>	Identify and describe the most critical performance problems that manufacturing businesses typically face. Describe how improvements are identified.

Cluster Topic
MNC06
SAFETY, HEALTH AND ENVIRONMENTAL: *Understand the importance of health, safety, and environmental management systems in organizations and their importance to organizational performance and regulatory compliance. Follow organizational policies and procedures and contribute to continuous improvement in performance and compliance.*

MNC06.01	Maintain safe and healthful working conditions and environment to ensure employee safety.
MNC06.01.01	Assess workplace conditions according to specified safety and health requirements.
<i>Sample Indicators</i>	Identify the types of risk of injury/illness at work. Identify those who are susceptible to risk of injury/illness at work. Describe ways to positively impact occupational safety and health.
MNC06.02	Understand employee rights and responsibilities and employer obligations concerning occupational safety and health.
MNC06.02.01	Demonstrate knowledge of rules and laws designed to promote safety and health and their rationale.
<i>Sample Indicators</i>	Identify key rights of employees related to occupational safety and health. Identify the responsibilities of employers related to occupational safety and health. Explain the role of government agencies in providing a safe workplace.
MNC06.03	Assess types and sources of workplace hazards in order to maintain safe working conditions in a manufacturing business environment.
MNC06.03.01	Demonstrate methods to correct common hazards following appropriate safety procedures.
<i>Sample Indicators</i>	Identify and describe common hazards in the workplace. Identify and describe major sources of information about hazards in the workplace (e.g., MSDS, work procedures, exposure control plans, training materials, labels, and signage). Identify sources of combustible/flammable materials, fire and emergencies to establish a fire safe environment. Interpret safety signs and symbols.



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Control workplace hazards in order to maintain safe working conditions in a manufacturing business environment.

MNC06.04

MNC06.04.01

Demonstrate safe workplace practices that promote personal and group health.

Sample Indicators

Identify procedures necessary for maintaining a safe work area.
Identify methods to correct common hazards.
Identify methods for disposing of hazardous materials.

Demonstrate principals of safe physical movement to avoid slips, trips, and spills.
Inspect and use protective equipment (PPE).

Summarize safety, health, and environmental management systems to build an understanding of compliance with governmental policies and procedures for manufacturing businesses.

MNC06.05

MNC06.05.01

Identify the major federal and state regulatory areas.

Sample Indicators

Identify specific health and safety laws and regulations that impact manufacturing and the major topics they address.
Identify specific environmental management laws and regulations and the major topics they address.

MNC06.05.02

Explain how government agencies ensure compliance with environmental regulations and promote improved performance.

Sample Indicators

Provide examples of the major regulations and types of data used by government to measure and monitor performance.
Provide examples of how manufacturing organizations ensure their compliance.
Provide examples of consequences that manufacturing organizations suffer when they fail to comply.

MNC06.05.03

Demonstrate workplace activities that comply with safety, health, and environmental policies and procedures.

Sample Indicators

Promote and maintain knowledge of organizational safety, health, and environmental management policies and procedures.
Follow organizational policies and procedures.
Educate and orient other workers.
Maintain a safe work area.
Identify, describe, and report workplace hazards.
Perform and participate in regular audits and inspections.
Provide and maintain documentation needed for compliance.
Conduct and participate in accident/incident investigations.

MNC06.05.04

Develop plans to improve safety performance.

Sample Indicators

Use structured problem-solving process to develop improvement plans.

Cluster Topic
MNC07

LEADERSHIP AND TEAMWORK: *Use leadership and teamwork skills in collaborating with others to accomplish organizational goals and objectives.*

No additional statements in this topic beyond those found in the Essential Knowledge and Skills Chart.

Cluster Topic
MNC08

ETHICS AND LEGAL RESPONSIBILITIES: *Know and understand the importance of professional ethics and legal responsibilities.*



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No additional statements in this topic beyond those found in the Essential Knowledge and Skills Chart.

Cluster Topic
MNC09

EMPLOYABILITY AND CAREER DEVELOPMENT: *Know and understand the importance of employability skills. Explore, plan, and effectively manage careers. Know and understand the importance of entrepreneurship skills.*

No additional statements in this topic beyond those found in the Essential Knowledge and Skills Chart.

Cluster Topic
MNC10

TECHNICAL SKILLS: *Use the technical knowledge and skills required to pursue the targeted careers for all pathways in the career cluster, including knowledge of design, operation, and maintenance of technological systems critical to the career cluster.*

MNC10.01

Describe and employ technical skills and knowledge required for careers in manufacturing in order to perform basic workplace activities common to manufacturing.

MNC10.01.01 Demonstrate the planning and layout processes (e.g., designing, print reading, measuring) used in manufacturing.

Sample Indicators Read prints and use the information to play, lay out, and produce parts or products.

MNC10.01.02 Summarize how materials can be processed using tools and machines.

Sample Indicators Use tools and the processes of cutting, shaping, combining, forming, etc. of materials to manufacture a part or product.

MNC10.01.03 Describe various types of assembling processes (e.g., mechanical fastening, mechanical force, joining, fusion bonding, adhesive bonding) used in manufacturing.

Sample Indicators Apply appropriate fastening or joining procedure to the design and production of a manufactured part or product.

MNC10.01.04 Explain finishing processes (e.g., types of finishing materials, surface preparation, methods of application) used in manufacturing.

Sample Indicators Select a finishing process for a product appropriate to the job it must perform environment in which it functions, and its aesthetic appeal.

MNC10.01.05 Explain the processes of inspection and quality control used in manufacturing.

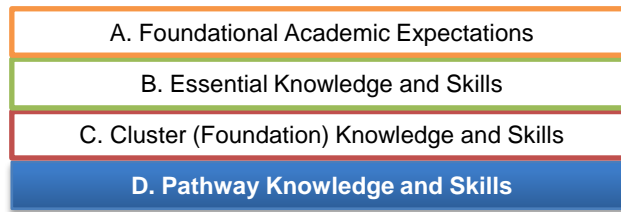
Sample Indicators Perform continuous on line inspections to ensure that parts or products meet design specifications.

D. PATHWAY KNOWLEDGE AND SKILLS

The following knowledge and skill statements apply to all careers in the Health, Safety and Environmental Assurance Pathway. The statements are organized within ten topics.



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Pathway Topic
MNPF01 **EQUIPMENT SAFETY**

MNPF01.01	Demonstrate the safe use of manufacturing equipment in order to assure health and safety in the work environment.
MNPF01.01.01	Train others to use equipment following safe production practices.
<i>Sample Indicators</i>	<p>Give new operators a complete orientation of equipment.</p> <p>Make sure that all important information regarding equipment safety is communicated clearly and effectively.</p> <p>Make sure that maintenance workers obtain certification to train others in technical skills and knowledge where applicable.</p> <p>Make suggestions regarding training materials and content to appropriate parties.</p> <p>Use evaluations and feedback to improve training materials and methods.</p> <p>Make sure trainees have the correct tools to do the job during training</p> <p>Conduct post-training evaluation to assure that workers can operate equipment safely.</p> <p>Use training and facilitation techniques appropriate for the audience.</p> <p>Document the quality and effectiveness of training.</p>
MNPF01.01.02	Suggest processes and procedures to support safety and effectiveness in the work environment.
<i>Sample Indicators</i>	<p>Consult health and safety representatives to develop suggestions.</p> <p>Solicit operator feedback for use in creating a safer, more effective work environment.</p> <p>Make sure suggestions for training improvement are documented and sent to the appropriate parties.</p>
MNPF01.01.03	Maintain, install, and repair equipment following required safety and health requirements.
<i>Sample Indicators</i>	<p>Make regular safety communications to all employees.</p> <p>Review job safety analyses according to company policy.</p> <p>Follow hazardous materials procedures and policies such as Material Safety Data Sheet and "right to know."</p> <p>Perform environmental testing of workplace on a regular basis as required by company policy or regulation.</p> <p>Audit equipment to ensure there are no by-passes of safety guards.</p> <p>Verify that regulatory and company safety procedures are followed including lock-out/tag-out, confined space, and ergonomics.</p> <p>Follow good housekeeping procedures.</p> <p>Verify that safety and personal protective equipment is available, performs correctly, and has current certification.</p>
MNPF01.01.04	Monitor equipment and operator according to workplace safety and compliance with both company and national regulations.
<i>Sample Indicators</i>	<p>Perform monitoring responsibilities regularly.</p> <p>Report out-of-compliance or unsafe conditions immediately.</p>



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Take corrective action on out-of-compliance or unsafe conditions.
Check equipment to ensure it is operating according to specifications.
Check tools for compliance with specifications.
Forward accident and injury data to appropriate personnel for inclusion in OSHA recordables.
Gather information on equipment use from operators to reveal existing or potential problems.
Adjust equipment and processes as required.
Document all monitoring data accurately.

Pathway Topic
MNPF02 **PLANNING**

MNPF02.01 **Complete procedures used in planning for safety in a new production process to ensure health, safety, and environmental well-being.**

- MNPF02.01.01 Report hazards and problems.
Sample Indicators Identify hazards and problems correctly.
Document hazards and problems properly.
Follow policy and procedure to report hazards and problems.
Communicate problems, hazards, and alerts promptly to appropriate parties.
Make sure that incident and accident reports are complete, accurate, and available to relevant parties.
- MNPF02.01.02 Demonstrate actions that adhere to policies and procedures.
Sample Indicators Train employees properly in all safety procedures.
Enforce company policies and procedures consistently according to the company policies and procedures.
Make sure that safety policies are clear.
Post safety policies properly.
File safety violation reports and forms in a timely way.
Conduct follow-up on safety violation reports and forms.
Make sure that documentation of enforcement action is complete, clear, and conforming to regulatory requirements.
- MNPF02.01.03 Take corrective action regarding safety policies and procedures.
Sample Indicators Make sure that corrective actions regarding safety are correct and complete.
Make sure that when correction actions are necessary that they are communicated clearly and appropriately to others.
Take corrective actions immediate after discovery of safety hazard or problem.
Make sure that follow-up occurs after corrective action takes place to ensure safe behavior is being exhibited.
- MNPF02.01.04 Document hazards and problems.
Sample Indicators Make sure that documentation meets all regulations.
Make sure that documentation is clear, accurate, and legible.
Make sure that documentation is filed and accessible by relevant parties.
Make sure that documentation is completed and updated in a timely way.
- MNPF02.01.05 Implement safety programs.
Sample Indicators Make sure that new equipment conforms to safe manufacturing practices.
Use Lock out/Tag out procedures properly.
Evaluate product handling for physical safety concerns.
Include safety features in product design.



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Pathway Topic	INVESTIGATIONS
MNPF03	
MNPF03.01	Conduct health, safety, and/or environmental incident and hazard investigations to maintain quality in the manufacturing environment and products.
MNPF03.01.01	Investigate health safety, and/or environmental incidents.
<i>Sample Indicators</i>	Follow the procedures established for investigations. Use root cause analysis to identify factors contributing to the incident. Use a standard procedure to interview all relevant parties in an impartial and tactful manner. Report investigation findings in a timely manner. Include relevant experts as needed in the incident investigation.
MNPF03.01.02	Investigate health, safety, and/or environmental hazards.
<i>Sample Indicators</i>	Identify potential safety hazards promptly. Use established procedures to correct the hazard and report to correct parties for immediate attention. Complete documentation where appropriate and forward to correct parties.
MNPF03.01.03	Document findings of health, safety, and/or environmental investigations.
<i>Sample Indicators</i>	Complete documentation accurately and submit to correct parties in a timely manner. Use appropriate procedures to include conclusions and recommended corrective action. Verify that documentation meets all applicable laws and regulations. Verify that documentation includes all necessary signatures.
MNPF03.01.04	Recommend corrective actions that comply with regulations.
<i>Sample Indicators</i>	Make recommendations based on solid data and root cause analysis. Document suggested actions appropriately and communicate them to the appropriate parties in a timely manner. Use the findings of the investigation to prepare suggested actions.
MNPF03.01.05	Check that appropriate action has been taken to correct health safety, and/or environmental problems.
<i>Sample Indicators</i>	Update safe operating procedures in a timely manner. Complete safety work orders in a timely manner. Develop and deliver worker training if required. Analyze incident rates to determine if corrective action was effective. Complete follow-up investigation to ensure that corrective action is taken and root cause is addressed.

Pathway Topic	INSPECTIONS
MNPF04	
MNPF04.01	Conduct preventive health, safety, and/or environmental incident and hazard inspections to assure a healthy and safe manufacturing work environment.
MNPF04.01.01	Conduct health safety, and/or environmental inspections.
<i>Sample Indicators</i>	Make sure that audit records and documentation are complete and available. Use established procedures to conduct audits. Complete documentation related to audit.



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	Use appropriate forums and format to report audit.
	Arrange for experts in situations needing additional credibility on an as needed basis.
MNPF04.01.02	Document findings of health, safety, and/or environmental investigations.
<i>Sample Indicators</i>	Complete inspection reports accurately. Verify that corrective action reports or logs exist. Submit documentation to correct parties according to schedule. Verify that documentation includes all relevant information.
MNPF04.01.03	Conduct area health safety, and/or environmental inspections.
<i>Sample Indicators</i>	Make sure that area inspection documentation is complete and available. Use procedures established to conduct area inspections. Use an appropriate forum and format to report area inspection documentation. Verify that inspections are thorough, timely and cover all relevant aspects of health safety, and/or environmental concerns. Verify that inspection includes visual inspections as well as information gathered directly from workers. Arrange for relevant experts in situations needing additional credibility on an as needed basis.
MNPF04.01.04	Submit inspection and audit findings to correct parties.
<i>Sample Indicators</i>	Verify that record of transmittal of inspection and audit findings is complete, accurate, and includes all necessary signatures. Verify that inspection and audit findings are on file. Post inspection and audit findings appropriately to ensure their accessibility to all relevant parties.
MNPF04.01.05	Confirm job safety analysis against actual experience on a regular basis.
<i>Sample Indicators</i>	Conduct verification according to approved schedule. Do the verification on the basis of the existing data. Verify that compliance rate reports are on file.

Pathway Topic
MNPF05 **COMPLIANCE**

MNPF05.01	Implement health, safety, and/or environmental programs, projects, policies, or procedures to assure a healthy and safe manufacturing work environment.
MNPF05.01.01	Document regulatory compliance using accepted protocols.
<i>Sample Indicators</i>	Use approved schedules and specifications to complete regulatory compliance activities. Verify that compliance documentation meets all regulatory, legal, and company standards. Verify that the current list of applicable regulations is accessible to all parties as required. Verify that compliance documentation is on file and accessible to all relevant parties. Maintain a system for filing the sign-off sheets for compliance.
MNPF05.01.02	Communicate about company health, safety and environmental policies and procedures to a variety of audiences.



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<i>Sample Indicators</i>	Make health, safety, and environmental policies appropriately visible in the workplace. Use multiple methods to communicate policies and procedures. Maintain records of worker notification of policies and procedures on file. Deliver communication to correct parties in a timely manner. Obtain feedback from workers to determine effectiveness of communications. Use worker feedback to modify communication methods.
MNPFF05.01.03 <i>Sample Indicators</i>	Follow the steps to stop an unsafe work practice. Modify manufacturing process to attain adequate levels of safety. Correct unsafe behavior immediately and communicate to correct parties. Use appropriate forum and format to document notice of unsafe practices. Use preventive maintenance or departmental safety audits to record corrective action for unsafe work practices. Update safety policies on a regular basis. Determine if observations and review of safety records show reduction in targeted injuries or unsafe behaviors. Give priority to avoiding unsafe practices when planning new manufacturing processes.
MNPFF05.01.04 <i>Sample Indicators</i>	Recommend solutions that will eliminate unsafe practices. Make sure all relevant parties are included in the development of safety solutions. Schedule follow-up meetings that include all appropriate parties to discuss solutions. Test and revise proposed solution(s) as necessary. Document suggestions and forward to correct parties.
MNPFF05.01.05 <i>Sample Indicators</i>	Report violations to appropriate authorities. Keep violation reports, including disciplinary action where appropriate, on file. Distribute violation reports to the responsible party. Follow the legal, regulatory and company policy to communicate violations to the proper authorities. Use the chain of command to ensure that corrective action is taken.
MNPFF05.01.06 <i>Sample Indicators</i>	Use the appropriate channels to report health, safety, and environmental concerns. Prepare for health, safety, and environmental emergencies. Develop employee and fire emergency plans before emergencies occur. Implement employee and fire emergency plans during an emergency. Verify that emergency equipment is available and in working order. Take necessary action to ensure that employees are properly trained in emergency procedures. Use company policies and procedures to complete emergency drills.

Pathway Topic
MNPFF06 **CONTINUOUS IMPROVEMENT**

MNPFF06.01	Implement continuous improvement protocols and techniques in health, safety, and/or environmental practices to enhance the manufacturing environment.
MNPFF06.01.01 <i>Sample Indicators</i>	Analyze root causes or problems and prioritize problems that need to be addressed first. Identify, document, and communicate priorities clearly. Use appropriate data to prioritize goals and problems.



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MNPFF06.01.02 <i>Sample Indicators</i>	<p>Use specific situations to base selection of appropriate data analysis methods. Complete data analysis documentation accurately. Use input from workers and management to determine priorities.</p> <p>Analyze health, safety, and/or environmental data. Verify that analysis contains sufficient detail to meet applicable standards. Complete documentation of analysis accurately. Make raw data available for inspection. Compare company's health, safety, and/or environmental assurance trends against industry health, safety, and/or environmental trends. Forward analysis to correct parties. Select appropriate analysis methods and use them properly.</p> <p>Use appropriate and accurate metrics and/or develop them for use in the analysis.</p>
MNPFF06.01.03 <i>Sample Indicators</i>	<p>Use charts, graphs, or tables to communicate data in written conclusions and plans.</p> <p>Select projects that address priorities identified to improve health, safety and/or environmental assurance. Design projects to support and reinforce established company goals.</p> <p>Take necessary action to involve all relevant parties in the development of the project. Use scheduling methods to ensure timely development.</p>
MNPFF06.01.04 <i>Sample Indicators</i>	<p>Verify that project plans are complete, detailed and include the resource requirements.</p> <p>Benchmark health, safety, and/or environmental practices. Gather appropriate information from recognized industry leaders. Arrange for independent evaluations of worksite health, safety, and/or environmental assurance practices. Use benchmarking information as a basis for making recommendations.</p> <p>Conduct and document analysis comparing current practice against benchmark data. Use a variety of means to gather information regarding excellent health, safety, and/or environmental assurance practices.</p>
MNPFF06.01.05 <i>Sample Indicators</i>	<p>Describe policies and procedures for health, safety, and/or environmental issues. Attend workshops, conferences, and other career development sessions. Take action to ensure that involvement in a professional society relevant to job activities is ongoing. Take action to ensure that up-to-date resources on health, safety, and/or environmental assurance are accessible to all relevant parties.</p>

Pathway Topic MNPFF07	PROMOTION
MNPFF07.01	Promote health, safety, and/or environmental assurance programs in order to assure a healthy and safe manufacturing work environment.
MNPFF07.01.01 <i>Sample Indicators</i>	Advocate workplace safety in accordance with safety programs. Make workplace safety posters and other relevant information visible. Identify, model, recognize, and publicize manufacturing practices for health, safety, and/or environmental assurance.



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MNPFF07.01.02	<p>Make sure that workers responsible for health, safety, and/or environmental assurance are regularly present in manufacturing workplace to encourage good health, safety, and/or environmental assurance practices.</p> <p>Suggest health, safety, and/or environmental assurance programs to management and other workers.</p> <p><i>Sample Indicators</i></p> <p>Keep materials supporting health, safety, and/or environmental assurance programs on file.</p>
MNPFF07.01.03	<p>Document suggestions supporting health, safety, and/or environmental assurance. Forward suggestions supporting health, safety, and/or environmental assurance to all relevant parties.</p> <p>Make suggestions based on an accurate assessment of employee needs and interests, requirements in the workplace, and business objectives.</p> <p>Discuss data and statistical analysis with decision-makers.</p> <p>Hold meetings to advocate for health, safety, and/or environmental assurance programs with all relevant parties.</p> <p>Use various methods to market benefits of high quality suggestions supporting health, safety, and/or environmental assurance programs.</p> <p>Evaluate health, safety, and/or environmental assurance programs.</p> <p><i>Sample Indicators</i></p> <p>Continuously maintain, evaluate, and report recordable incidents of injury and other incidences of health, safety, and/or environmental assurance.</p> <p>Maintain a log of health, safety, and/or environmental assurance information.</p> <p>Communicate evaluations to correct parties in a timely manner.</p> <p>Use evaluations to improve the outcomes of health, safety, and/or environmental assurance programs.</p> <p>Keep self-assessment studies on health, safety, and/or environmental assurance programs on file.</p> <p>Compare health, safety, and/or environmental assurance statistics with industry benchmarks or standards.</p>
MNPFF07.01.04	<p>Educate others about the benefits of health, safety, and/or environmental assurance programs.</p> <p><i>Sample Indicators</i></p> <p>Design or purchase materials supporting health, safety, and/or environmental assurance programs that are clear and appropriate for the intended audience.</p> <p>Keep health, safety, and/or environmental assurance materials on file and accessible.</p> <p>Hold meetings to educate individuals about health, safety, and/or environmental assurance programs with all relevant groups.</p> <p>Use various methods to advertise benefits for and elements of high quality health, safety, and/or environmental assurance programs.</p> <p>Use various methods to educate new hires about the company's commitment to safety.</p> <p>Provide continuing education to employees.</p> <p>Make sure that education activities include cost-benefit analysis of workers' compensation programs.</p>

Pathway Topic MNPFF08	ANALYSIS
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MNPFF08.01	Conduct job safety and health analysis for manufacturing jobs, equipment, and processes to enhance identification of priorities for health, safety, and environmental assurance programs.
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MNPFF08.01.01	Consult with outside sources about health, safety, and/or environmental assurance aspects of jobs.
<i>Sample Indicators</i>	Maintain an accurate list of relevant outside sources. Make postings of current emergency contact information accessible to all relevant parties. Maintain a contact log.
MNPFF08.01.02	Develop job safety analysis for health, safety and environmental assurance programs.
<i>Sample Indicators</i>	Hold meetings to conduct job safety analysis with all relevant parties. Generate suggestions for job safety improvements. Document and analyze relevant data. Hold one-on-one and small group meetings with workers to identify job safety issues. Make observations at worksites on a regular basis to gather information for job safety analysis.
MNPFF08.01.03	Employ a variety of methods to gather information from employees about occupational hazards.
<i>Sample Indicators</i>	Observe employees on a regular basis for safe work behaviors and practices. Maintain records of employee interviews regarding occupational hazards. Publish and distribute safety reports and statistics to relevant parties. Provide a method for employees to report safety concerns to relevant parties.
MNPFF08.01.04	Suggest ways to eliminate hazards.
<i>Sample Indicators</i>	Keep suggestions for eliminating the hazard on file. Complete safety-related work orders in a timely manner. Communicate suggestions to correct parties. Make suggestions that are relevant and appropriate.
MNPFF08.01.05	Verify job safety analysis against experience on a regular basis.
<i>Sample Indicators</i>	Evaluate job safety analysis with relevant injury and worksite data. Interview employees to gain their input.
MNPFF08.01.06	Conduct activities that educate others about the benefits of workplace health, safety, and/or environmental assurance programs.
<i>Sample Indicators</i>	Design or purchase materials supporting health, safety, and/or environmental assurance programs that are clear and appropriate for the intended audience. Verify that health, safety, and/or environmental assurance materials are on file and accessible. Hold meetings with all relevant groups to educate individuals about health, safety, and/or environmental assurance programs. Use various methods to advertise benefits for and elements of high quality suggestions supporting health, safety, and/or environmental assurance programs. Use appropriate methods to educate new hires about the company's commitment to safety. Provide continuing education to employees. Include cost-benefit analysis of workers' compensation programs in education activities.



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MNPF09.01 Perform safety inspections and implement safety practices related to safety, health, and environmental assurance in order to maintain a safe and productive manufacturing workplace.

MNPF09.01.01 Perform environmental and safety inspections following local, federal and company regulations.

Sample Indicators Identify, report and monitor potential hazards in the workplace.
Take action to correct potential hazards.
Review health, safety, and environmental documentation and policies thoroughly and regularly.
Ensure that inspections meet all relevant, health, safety, and environmental laws and regulations.
Complete inspections according to company schedule and procedures.
Document inspection records and store them correctly.

MNPF09.01.02 Perform emergency drills as part of an emergency response team.

Sample Indicators Confirm that first aid training and certification on emergency and first aid procedures are complete and up-to-date.
Comply with company and regulatory policies and procedures to respond to emergencies.
Document emergency drills and incidents according to company and regulatory procedures promptly.

MNPF09.01.03 Identify unsafe conditions according to safety standards.

Sample Indicators Identify, report, and document conditions presenting a threat to health, safety, and the environment.
Identify corrective actions.

MNPF09.01.04 Take corrective action following safety protocols

Sample Indicators Consult appropriate parties about corrective actions and take corrective actions following company procedures promptly.
Track and report ongoing safety concerns until corrective action is taken.

MNPF09.01.05 Train other employees in safe practices and emergency procedures following training orientation guidelines.

Sample Indicators Verify that all topics and procedures are covered in orientation to facilitate employee safety.

Observe orientation to ensure that it makes clear the need and processes for employees to raise safety concerns, ask questions, and receive additional training.
Use company requirements to document orientation.
Verify that orientation meets all relevant laws, policies, and regulations.
Deliver safety instruction and updates on a regular schedule.

Pathway Topic
MNPF10

TRAINING

MNPF10.01 Train workers in health, safety, and/or environmental issues in order to in order to provide a safe, healthy and productive manufacturing work environment.

MNPF10.01.01 Determine priorities for health, safety, and/or environmental training needs.

Sample Indicators Conduct analysis of health, safety, and/or environmental tasks at the job level.

Analyze health, safety, and/or environmental records to identify training needs.



Manufacturing Career Cluster Health, Safety and Environmental Assurance Pathway Knowledge and Skill Statements

	<p>Document results of training assessments. Use the analysis to develop training plans with clear objectives. Solicit worker input regarding training needs.</p>
MNPF10.01.02 <i>Sample Indicators</i>	<p>Prepare health, safety, and/or environmental training materials. Use appropriate resources to ensure that content included in training materials meets industry, government, and company standards. Work with appropriate personnel to ensure that the training materials includes the correct content to meet the training needs. Develop and implement a system to ensure that training materials are updated continuously.</p> <p>Work with appropriate personnel and outside sources as needed to make sure that training materials are clear, worker-friendly, and appropriate for the audience. Develop and implement a system to ensure that training materials are available and accessible to all relevant parties.</p>
MNPF10.01.03 <i>Sample Indicators</i>	<p>Conduct health, safety, and/or environmental training for employees. Document employee records to show that training has been delivered. Develop a training schedule that facilitates participation of employees.</p> <p>Develop evaluations that indicate workers' understanding of the training materials. Develop a system for verifying that appropriate workers receive training. Show how test results and certifications achieved indicate effective training.</p>
MNPF10.01.04 <i>Sample Indicators</i>	<p>Document required health, safety, and/or environmental training. Maintain training attendance records on file. Develop and maintain a training profile for each job. Maintain accurate records of test results and certifications achieved. Make documentation available on an as needed basis to appropriate parties. Request feedback from trainees and document feedback that is received. Maintain confidentiality of the outcomes of the health, safety, and/or environmental assurance training.</p>
MNPF10.01.05 <i>Sample Indicators</i>	<p>Plan future health, safety, and/or environmental training. Make sure that appropriate content is included in training plans. Design training for the specific needs of individuals. Ask appropriate workers for input related to the content of the training. Design training plan to include effective evaluation and follow-up process. Include worker feedback when developing future training.</p>