

The Manufacturing Industry

Media Type: Microsoft® PowerPoint® Presentation

Duration: 60 slides

Goal: To introduce students to the manufacturing industry.

Description: Students will learn about the manufacturing industry and the career opportunities within the industry. Students will also learn about the technological evolution of the industry and what impacts technology has made. This presentation also provides an overview of safety within the industry.

Objectives:

1. To provide an overview of the manufacturing industry.
2. To evaluate how the development of technology has affected the manufacturing industry.



Manufacturing Career Cluster (MN)

Cluster	Standard
	Evaluate the nature and scope of the Manufacturing Career Cluster™ and the role of manufacturing in society and in the economy.
	Analyze and summarize how manufacturing businesses improve performance.
	Comply with federal, state and local regulations to ensure worker safety and health and environmental work practices.
	Describe career opportunities and means to achieve those opportunities in each of the Manufacturing Career Pathways.
	Describe government policies and industry standards that apply to manufacturing.
	Demonstrate workplace knowledge and skills common to manufacturing.
Health, Safety & Environmental Assurance Career Pathway (MN-HSE)	Develop safety plans for production processes that meet health, safety and environmental standards.
	Demonstrate a safety inspection process to assure a healthy and safe manufacturing environment.
	Evaluate a system of health, safety and/or environmental programs, projects, policies or procedures to determine compliance.
	Evaluate continuous improvement protocols and techniques in health, safety and/or environmental practices.
	Conduct job safety and health analysis for manufacturing jobs, equipment and processes.
	Develop the components of a training program based on environmental health and safety regulations.
Logistics & Inventory Control Career Pathway (MN-LOG)	Demonstrate proper handling of products and materials in a manufacturing facility.
	Develop a safety inspection process to assure a healthy and safe manufacturing facility.
Manufacturing Production Process Development Career Pathway (MN-PPD)	Produce quality products that meet manufacturing standards and exceed customer satisfaction.
	Research, design and implement alternative manufacturing processes to manage production of new and/or improved products.
	Monitor, promote and maintain a safe and productive workplace using techniques and solutions that ensure safe production of products.
	Implement continuous improvement processes in order to maintain quality within manufacturing production.
	Develop procedures to create products that meet customer needs.
Production Career Pathway (MN-PRO)	Manage safe and healthy production working conditions and environmental risks.
	Make continuous improvement recommendations based on results of production process audits and inspections.
	Coordinate work teams when producing products to enhance production process and performance.

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Manufacturing Career Cluster (MN)

Cluster	Standard
Quality Assurance Career Pathway (MN-QA)	Evaluate production operations for product and process quality.
	Recommend and implement continuous improvement in manufacturing processes.
	Coordinate work teams to create a product that meets quality assurance standards.
	Employ project management processes using data and tools to deliver quality, value-added products.
	Perform safety inspections and training to ensure a safe and healthy workplace.
	Implement continuous improvement processes to maintain quality products.
	Identify inspection processes that ensure products meet quality specifications.

College & Career Readiness Anchor Standards for Writing

Writing Standards			
Text Types & Purposes	Write informative/explanatory texts to examine and convey complex ideas and information clearly and accurately through the effective selection, organization, and analysis of content.		
	<table border="1"> <tr> <td>9-12.2</td> <td>Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.</td> </tr> </table>	9-12.2	Write informative/explanatory texts to examine and convey complex ideas, concepts, and information clearly and accurately through the effective selection, organization, and analysis of content.
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Production & Distribution of Writing	Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.		
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Research to Build & Present Knowledge	Gather relevant information from multiple print and digital sources, assess the credibility and accuracy of each source, and integrate the information while avoiding plagiarism.		
	Draw evidence from literary or informational texts to support analysis, reflection, and research.		
	<table border="1"> <tr> <td>9-12.7</td> <td>Conduct short as well as more sustained research projects to answer a question or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.</td> </tr> </table>	9-12.7	Conduct short as well as more sustained research projects to answer a question or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.
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College & Career Readiness Anchor Standards for Speaking and Listening

Speaking & Listening Standards	
Comprehension & Collaboration	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.
	Integrate and evaluate information presented in diverse media and formats, including visually, quantitatively, and orally.
	9-12.1 Initiate and participate effectively in a range of collaborative discussions with diverse partners on grades 9–10 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.
	9-10.2 Integrate multiple sources of information presented in diverse media or formats evaluating the credibility and accuracy of each source.
	11-12.2 Integrate multiple sources of information presented in diverse formats and media in order to make informed decisions and solve problems, evaluating the credibility and accuracy of each source and noting any discrepancies among the data.
Presentation of Knowledge & Ideas	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.
	Make strategic use of digital media and visual displays of data to express information and enhance understanding of presentations.
	9-12.4 Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning and the organization, development, substance, and style are appropriate to purpose, audience, and task.
	9-10.5 Make strategic use of digital media in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.
	11-12.4 Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance, and style are appropriate to purpose, audience, and a range of formal and informal tasks.

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Lesson Plan

Student and Teacher Notes are available to print in outline format. You can access these documents under the “Printable Resources” section. If student licenses have been purchased, an interactive version of the Student Notes is available in the “Interactive Activities” section. If printing the full PowerPoint® is desired, you may download the file and print the handouts as needed.

Class 1: Begin class by distributing *The Manufacturing Industry Vocabulary Handout* for students to reference during the presentation. Show *The Manufacturing Industry - Introduction* segment. Follow the segment with its *Assessment*. Distribute the *Industry Interview Project* and allow students to begin researching questions.



Slides
1-19

Class 2: Remind students to continue using the *Vocabulary Handout* as reference materials. Show *The Manufacturing Industry - Technology* segment of the presentation. Follow the segment with the corresponding *Assessment*. Distribute the *Rise of Technology Project*. Allow students to begin their research.



Slides
20-35

Class 3: Remind students to continue using the *Vocabulary Handout*. Show *The Manufacturing Industry - Safety* segment of the presentation. Follow the segment with its *Assessment*. Assign the *Safety First Activity*. Students should begin the *Activity* which will be completed the following day. For more information see the *Teacher Instruction Sheet*.



Slides
36-60

Class 4: Distribute *The Manufacturing Industry Final Assessment* and allow time for students to complete it. Students should use the remainder of the class to complete the *Safety First Activity*.

Class 5: Have students present their *Rise of Technology Project* presentations.

Class 6: Have students present their *Industry Interview Project* presentations.



Lesson Links

Bureau of Labor Statistics: Manufacturing

- <http://www.bls.gov/iag/tgs/iag31-33.htm>

Occupational Safety & Health Administration

- www.osha.gov



Career & Technical Student Organizations

Skills USA

- Automated Manufacturing Technology
- Engineering Technology/Design
- Occupational Health & Safety
- Principles of Engineering/Technology

Technology Student Associations

- Manufacturing Prototype



Career Connections

Using the *Career Connections Activity*, allow students to explore the various careers associated with this lesson. See the *Activity* for more details. *If student licenses have been purchased:* Students will select the interviews to watch based on your directions. *If only a teacher license is purchased:* Show students all the career interviews and instruct them to only complete the interview form for the required number of interviews.

- iCEV50827, Lesley Chambers, Product Designer, Brown & Jordan International
- iCEV50799, Jeffrey Thompson, President, Etched Metal Company
- iCEV51100, Derek Logan, Project Engineer, Nissan Technical Center North America

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Lab Activities

Safety First

Directions:

Using the Internet, library or any other available resources, students will research and select a hazardous substance used in the manufacturing industry. Students should notify you before beginning any additional research in order make sure no two students select the same substance. Using the Internet, students will locate a Material Safety Data Sheet detailing the substance they chose and gather at least 10 facts about the substance. Students will develop a short (one to three minute) presentation detailing their findings as well as a 10 question quiz on the safety aspects of the substance selected. Students should share their findings with the class. Divide the class into groups of two or three. In groups, students should exchange their quizzes and complete the one they received. Once all quizzes are complete, students should check their quiz and discuss any wrong answers.



Projects

Industry Interview

Directions:

For this *Project*, students will interview a professional in the manufacturing industry. They may choose any of the careers outlined in the presentation. The interview should be based on purpose, duties and qualifications for the career. Using the presentation, Internet or other available resources, students will research and develop at least 10 questions to ask during the interview. Their questions should be open-ended to allow for expansion of each question. Once the interview is completed, students should write a one to two page essay detailing the information obtained from the interview and turn in their interview notes with the essay. After all interviews have been completed, lead a class discussion so students can share their findings with the class.

Rise of Technology

Directions:

For this *Project*, students will trace the progress of industry growth by investigating a chosen piece of technology used in manufacturing. Students will start by using any available resources to research and better understand a technology used within the manufacturing industry. Students should then trace the evolution of the technology and analyze events which influenced the development and research how the technology altered the means of engineering, production, consumption and distribution of goods once it was adopted as well as locating the international effects of the technology. Students will then analyze the positive and negative aspects of the chosen technology and develop a visual presentation on the technology and discuss factors which affected the implementation of this technology. Remind students to attach a citation sheet listing all sources used. Students should share their findings with the class and be prepared to answer questions.