MINNESOTA MANUFACTURED

Statewide Tour of Manufacturing WEBINAR

SEPTEMBER 17, 2020

1:30-2:30 PM

Welcome! Note that as you enter the Zoom session, your microphone is muted, and your video feed is disabled.

MINNESOTA STATE
Advanced Manufacturing Center of Excellence

MINNESOTA STATE
Advanced Manufacturing Center of Excellence

MINNESOTA MANUFACTURED

Jaimee Meyer

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Center of Excellence

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Upcoming Webinar

Manufacturing Association Presentation

This webinar provides an overview of various testimonials and videos showcasing women succeeding in their careers in manufacturing. We will speak to different events that our state colleges have had to recruit females into their programs, and share various branding developed to inspire females to learn more about rewarding careers in manufacturing.

October 15, 2020: 1:30-2:30

Register:
https://minnstate.zoom.us/webinar/register/WN_vpsm3DlnSrOcOEP2NRqIDw

Advanced Manufacturing Center of Excellence

- One of eight Centers of Excellence serving industry needs through education
- Hosted by Bemidji State University, serving the state of Minnesota
- 24 technical and community colleges throughout Minnesota that offer certificate and degree programs in manufacturing
- Center's three strategic priorities include: Engaging Industry, Enhancing Education, and Inspiring Students to pursue careers in manufacturing
- Mission is to recruit and educate the next generation of workers

Statewide Tour of Manufacturing Webinar Goals

- Event Overview
- Event resource overview
- Sharing outcomes
- Showing promotional strategies
- Ways to get involved or participate
- Q&A

Statewide Tour of Manufacturing

NATIONAL ASSOCIATION OF Manufacturers

MFG DAY®

Statewide Tour of Manufacturing

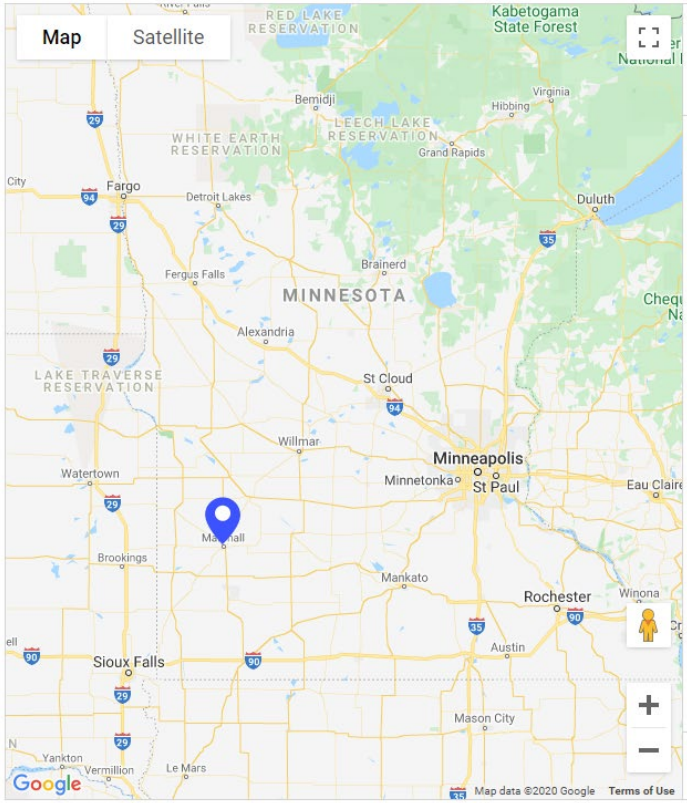
Offers schools, families and the general public a chance to see how modern manufacturing is high-tech and innovative

- Improve perception
- Demonstrate positive career opportunities in manufacturing
- Engage industry and influencers

Statewide Tour of Manufacturing

Today

Now onwards



OCT 5

October 5 @ 9:00 am - October 9 @ 3:00 pm

ACTION MANUFACTURING, INC. TOUR

Action Manufacturing, Inc. 1105 Lake Road, Marshall

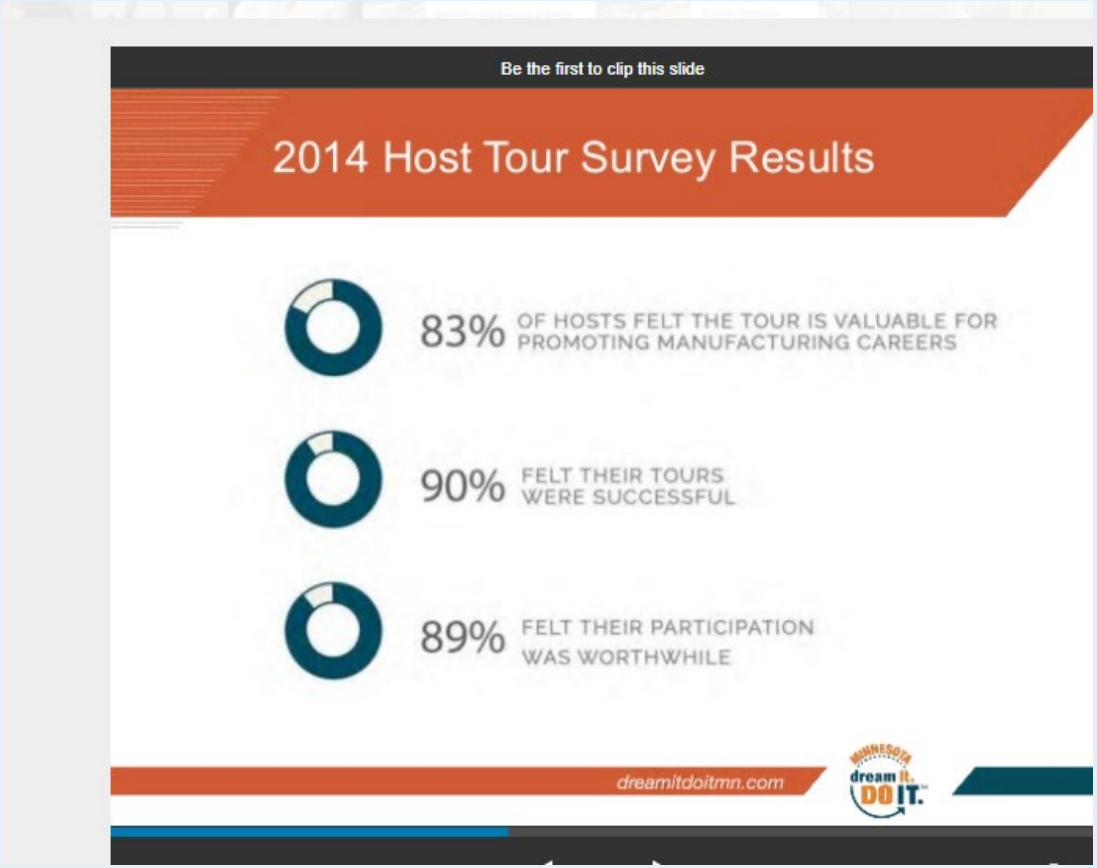
Previous Events

Next Events

Statewide Tour of Manufacturing

"I used to think factory jobs were just for people that could not get jobs anywhere else. They had great jobs and made good money. "
Student Tour Attendee

Statewide Tour of Manufacturing



Statewide Tour of Manufacturing – Host a Tour

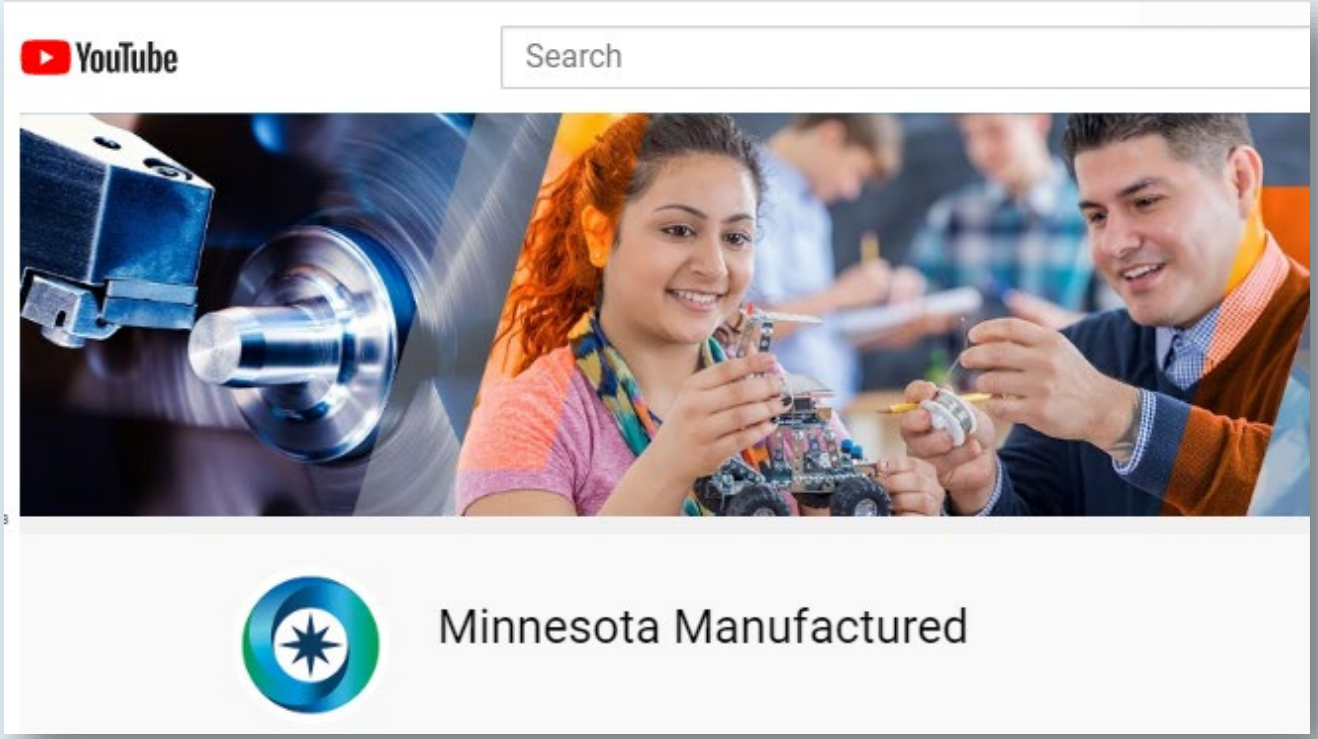
- Joining forces across the State of Minnesota to create a movement and inspire the next generation to consider a career in manufacturing. Make sure to register your tour with us to help spread the word

Teacher Guide: Table of Contents

- Chapter ONE: What is Manufacturing
- Chapter TWO: Manufacturing in Minnesota
- Chapter THREE: Careers in Manufacturing
- Mini Challenges
- Answer Keys
- Additional Resources
- Videos and presentation via YouTube channel

https://mnmfg.org/wp-content/uploads/2020/08/MNManufactured_Teachers_v2.5-1.pdf

Teacher Guide Videos and Presentations



https://www.youtube.com/channel/UCZoupOU31eiP9wfBkmRp4Eg?view_as=subscriber

Teacher Guide: Chapter One

What is Manufacturing ?

- Describes the manufacturing industry along with various manufacturing terms
- Links to five videos that feature manufacturing businesses in Minnesota
- Student activities throughout the toolkit will refer to these videos.

Chapter One

Manufacturing is diverse:

- Designing
- Developing products
- Robotics
- Working in Software,
- Developing green technology
- Customer service
- Marketing
- Finance too

CHAPTER 1

What is manufacturing?

HOW TO DEFINE MANUFACTURING

According to the Occupational Information Network (O*NET), manufacturing involves: "Planning, managing, and performing the processing of materials into intermediate or final products and related professional and technical support activities such as production planning and control, maintenance, and manufacturing/process engineering." The O*NET Program is the nation's primary source of occupational information. Visit https://www.onetcenter.org/overview.html for more information.

In short, manufacturing is making stuff.

Manufacturing has a range of fields, including designing machinery, developing products, knowing how to fix robots, working in software, and developing green technology. Later in this guide, we'll provide career information about the many fields in manufacturing.

Manufacturing Requires Skill and Ability. Do you like...

ROBOTICS?
FIXING CARS, SNOWMOBILES OR BIKES?
ASSEMBLING MODELS?
BUILDING WITH LEGOS?
SOLVING PUZZLES?

These skills and more all relate to manufacturing. Being able to visualize, design, program are all skills you use to develop products. Just think, instead of fixing a car, you could design the parts for a car. The manufacturing industry requires other areas of expertise too, offering careers from customer service to marketing or even finance.

"We make, or help make, or help our customers make, pretty much anything... The range of what we can do is endless."

REBECCA GRAMSE, MRG TOOL AND DIE — FARIBAULT, MN

Applicable Education Standards

- Applicable education standards:

- Science (Grades 6-12)
- Technology (Grades 9-12)
- Language Arts (Grades 6-12)

APPLICABLE EDUCATION STANDARDS

Science: (Grade 6-12)

Strand 1: Nature of Science and Engineering
- Sub strand 1: The practice of Science (grade 7-12)
- Sub strand 2: The practice of Engineering (grade 6, 9-12)
- Sub strand 3: Interaction among science, technology, engineering, mathematics, and society

Technology: (Grade 9-12)

Strand 1: Inquiry, Research, and Problem Solving: The student will learn a continuous cycle of questioning, gathering, synthesizing, evaluating, and using information individually and collaboratively to create new knowledge and apply it to real world situations.

Strand 2: Expanding Literacies: Read, view, listen, and communicate in any format for a variety of purposes.
- Sub strand 2: Collaboration

Language Arts: (Grade 6-12)

ANCHOR STANDARDS FOR SPEAKING, VIEWING, LISTENING, & MEDIA LITERACY:

Strand 1: Comprehension and Collaboration

Strand 2: Presentation of Knowledge and Ideas

Strand 3: Media Literacy

ANCHOR LANGUAGE STANDARDS:

Strand 4: Conventions of standard English

ANCHOR STANDARDS FOR WRITING:

Strand 5: Text types and purposes

Strand 6: Research to build and present knowledge

Chapter Objectives

OBJECTIVES

Students will be able to:

- Place parts of a story in the appropriate order to represent the manufacturing cycle
- Understand and identify 12 manufacturing terms with their definitions
- Contrast the phenomenon of reality vs. perception
- Appreciate machining and welding in Minnesota
- Apply the manufacturing cycle to a product they create
- Differentiate steps of the manufacturing cycle
- Apply research from different manufacturing companies into a creative jingle or slogan

Activity Sheets

Activity 1

MANUFACTURING TERMS & DEFINITIONS

STUDENT NAME _____

Directions: Match each term with their definition on the other column by letter.

1. _____ MARKET RESEARCH
2. _____ PROTOTYPE
3. _____ RAW MATERIAL
4. _____ HANG TAG
5. _____ WAREHOUSE
6. _____ PRODUCTION
7. _____ DESIGN & DEVELOPMENT
8. _____ INNOVATION
9. _____ SUPPLIER
10. _____ OUTPUTS
11. _____ DISTRIBUTION
12. _____ MANUFACTURING COSTS

A. Taking a concept through the process of making a configuration, drawing, model, or plan that serves as the basis for the actual product and making sure the product meets specific needs or wants.

B. An original model on which something is patterned and used to develop a product.

C. Being creative.

D. A company that provides another company with goods or services, also called a vendor.

E. Amount of energy, work, products, or services produced in a given period by a company, individual or machine.

F. Process of assessing a new product or service through research (like surveys, focus groups, or product testing) to test reactions to a product or service before making it available to the general public.

G. Make the actual product: usually includes technology, advanced machines, robotics and assembly lines.

H. Something attached to a product (like a piece of clothing) that shares information about the manufacturer & the product.

I. A material or substance used to make something.

J. Taking an item after it has been manufactured and getting into the hands of a consumer.

K. The expense of materials, labor, and other components of the manufacturing process to create an end product.

L. Where products can be stored before distribution.

Quotables Throughout

"Manual equipment is the equipment that sits in the corner now. We have gone to CNC and that is all you will do, and the machine tools are very, very high-tech machine tools."

SETH ANDERSON, DOUGLAS MACHINE

"This is a lifelong career for me because it's something that'll always be needed; it's never going to go away."

BRANDON DECENT, LAKELAND MOLD

"You see on TV all these manufacturing plants that are really dirty, and then you come here and everything is clean! It's nothing like what people hear, or see, or think manufacturing is."

- ALICIA THOMSEN, ELECTRICAL ASSEMBLER

"One to two years in a technical program and you can come into a job making a very, very good wage."

ANDREW FREYHOLTZ, MECHANICAL DESIGNER

Quotables Throughout

"We make, or help make, or help our customers make, pretty much anything… The range of what we can do is endless."

REBECCA GRAMSE, MRG TOOL AND DIE — FARIBAULT, MN

"I didn't even know that manufacturing like this existed. Something that was clean, something that I would want to do. But now I love my job! I get here at six in the morning smiling!"

ALICIA THOMSEN, ELECTRICAL ASSEMBLER

"You take an aluminum block and make it into something that can fly. That's pretty cool."

TODD BAUMHARDT,
SENIOR MACHINIST AND SETUP

"I love my job in manufacturing because it's not a dead end job, and it's not just a job that you are at, it's a career that you can keep for a lifetime."

ERICA MORRISON, FABRICATOR/QUALITY SUPPORT

"I like the R&D (research & development) aspect. Somebod brings you something that's nev been done before, and [asks] 'Hey, can you build this part?'"

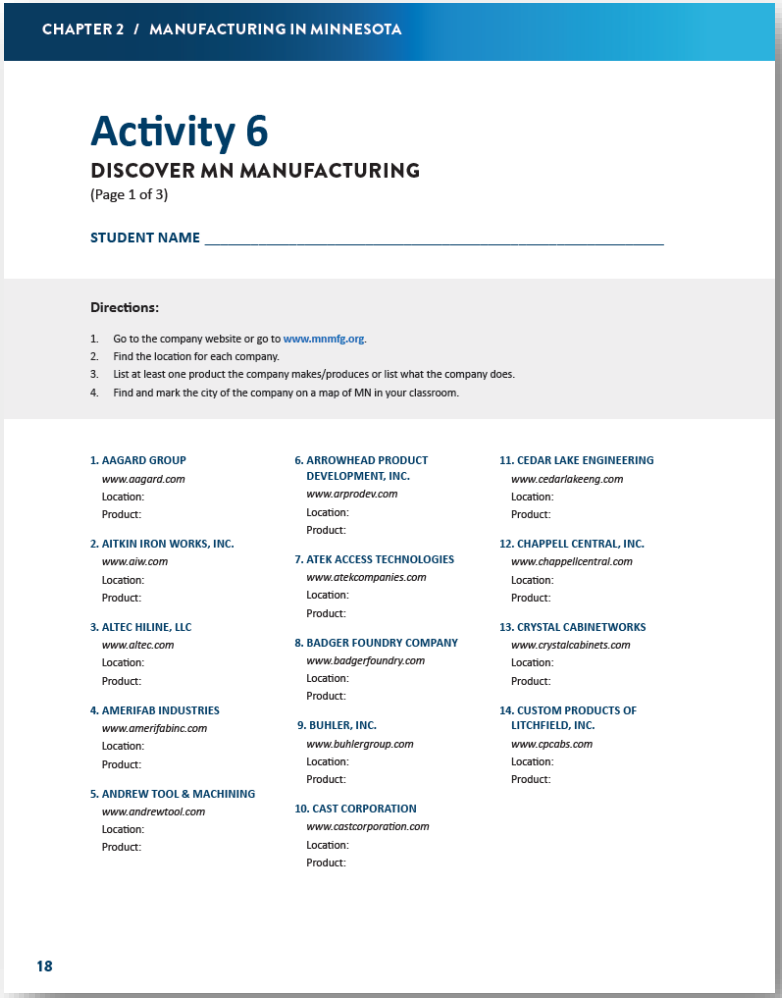
SETH ANDERSON, CNC PROGRAMMER

"It's really satisfying at the end of the day to say, 'Hey, I made this part of that fixture over there,' or 'I made this part of that car emblem mold.'"

REBECCA THOMAS, INDUSTRIAL ENGINEER

Chapter Two

- Chapter two keys in on Minnesota's manufacturing industry
- Includes information on specific Minnesota manufacturers
- What they make, and where they are located
- Quotes from Minnesota manufacturing employees woven throughout the toolkit help to provide relevance, context, and a genuine connection to opportunities here within the state.



CHAPTER 2 / MANUFACTURING IN MINNESOTA

Activity 6

DISCOVER MN MANUFACTURING

(Page 1 of 3)

STUDENT NAME _____

Directions:

1. Go to the company website or go to www.mnmfg.org.
2. Find the location for each company.
3. List at least one product the company makes/produces or list what the company does.
4. Find and mark the city of the company on a map of MN in your classroom.

1. AAGARD GROUP
www.aagard.com
Location:
Product:

2. AITKIN IRON WORKS, INC.
www.aiw.com
Location:
Product:

3. ALTEC HILINE, LLC
www.altec.com
Location:
Product:

4. AMERIFAB INDUSTRIES
www.amerifabinc.com
Location:
Product:

5. ANDREW TOOL & MACHINING
www.andrewtool.com
Location:
Product:

6. ARROWHEAD PRODUCT DEVELOPMENT, INC.
www.arprodev.com
Location:
Product:

7. ATEK ACCESS TECHNOLOGIES
www.atekcompanies.com
Location:
Product:

8. BADGER FOUNDRY COMPANY
www.badgerfoundry.com
Location:
Product:

9. BUHLER, INC.
www.buhlergroup.com
Location:
Product:

10. CAST CORPORATION
www.castcorporation.com
Location:
Product:

11. CEDAR LAKE ENGINEERING
www.cedarlakeeng.com
Location:
Product:

12. CHAPPELL CENTRAL, INC.
www.chappellcentral.com
Location:
Product:

13. CRYSTAL CABINETWORKS
www.crystalcabinets.com
Location:
Product:

14. CUSTOM PRODUCTS OF LITCHFIELD, INC.
www.cpcabs.com
Location:
Product:

18

Chapter Two

Ask the students:

- How does this fit with what you learned about manufacturing in the previous chapter?
- How does this affect what you think of manufacturing?
- Did you know Minnesota had manufacturing like this?

Chapter Three

- Helps students investigate manufacturing careers and career areas by gathering information from various sources.

OBJECTIVES

Students will be able to:

- Gather information from the web, handouts, videos, and possible personal experiences to help support their understanding of career areas in manufacturing
- Investigate manufacturing careers and career areas
- Recognize careers in manufacturing that are available in Minnesota
- Distinguish the education required for manufacturing careers
- Identify potential earnings in manufacturing in Minnesota
- List 6 main areas in engineering (manufacturing specific)
- Recognize the college manufacturing programs available in Minnesota
- Recognize the salaries for careers in manufacturing

Chapter Three

"One to two years in a technical program and you can come into a job making a very, very good wage."

ANDREW FREYHOLTZ, MECHANICAL DESIGNER

Handout 1

MANUFACTURING CAREERS

(Page 1 of 8)

CAREER OUTLOOK

Did you know that in Minnesota, advanced manufacturing:

- Is the third largest industry?
- Needs an estimated 11,000 workers?
- Is looking for educated workers who understand science, technology, engineering and math?
- Invents things? In fact, between 2006-2010, Minnesota had the largest number of patents.
- Includes some of the top brands, like 3M Company, Boston Scientific Corporation, Hormel, and Ecolab.

BUILD YOUR CAREER

With the right education, you can build your pathway to success-receiving a good paycheck for your work and advancing your career.

You can start by taking technical courses at a two-year college, earning a certificate or diploma. You'll have the skills to start your career, or you can keep going in your education.

You can take more courses to earn an Associate in Applied Science (A.A.S.). This will make you more qualified to move up the career ladder.

Your coursework will likely transfer to a four-year college or university, where you can earn a Bachelor's degree. You may even find some online opportunities that are convenient for your schedule.

CAREER OUTLOOK

Average Salary

MANUFACTURING JOBS	$67,288
MOST MN JOBS	$45,052

Minnesota manufacturing had roughly **11,120** job openings, and paid over...

$22,000,000,000

in wages to employees during 2019

Teacher Guide Resource

Handout 1

MANUFACTURING CAREERS

(Page 6 of 8)

MECHANICAL DESIGN & DRAFTING

What is it:

Using computer-aided design (CAD) to create models, design parts, write manufacturing instructions for the creation and assembly of parts.

What that means:

You use your knowledge of math, science, technology, and computer software to create 2D and 3D drawings and models so people know what they are making, such as its size, shape, and dimensions. You can develop ways to put parts together and provide instructions for making and assembling everything from simple one-piece parts to complex machines. As you gain experience, you can work your way up to designing custom parts customers buy directly. Nearly everything that is made needs someone who identifies the details needed to make it right.

Possible career titles:

CAD Drafter, CAD Designer, Engineering Technician, Mechanical Technician

Education:

To get started in this field, you'll want to look at a two-year degree.

What you'll learn in college:

You'll learn software like SolidWorks, Autodesk Inventor, or Creo (PRO/Engineer) so you know how to make models. You'll also learn how things work in manufacturing and the science of how materials work together.

Number of projected openings for 2016-2026:

265 Each Year

Potential earnings:

$16 - $25/HR

"It's really satisfying at the end of the day to say, 'Hey, I made this part of that fixture over there,' or 'I made this part of that car emblem mold.'"

REBECCA THOMAS, INDUSTRIAL ENGINEER

Chapter Three

Activity 9

CAREER INVESTIGATION

STUDENT NAME _____

Directions: Watch the Dynamic Group (Coon Rapids, Minnesota) video and answer the following questions.

1. What does the company do/make?

2. The following are careers of some of the Dynamic Group employees in the Coon Rapids, MN area. In one or two sentences, describe the following careers.

   TOOLING MANAGER

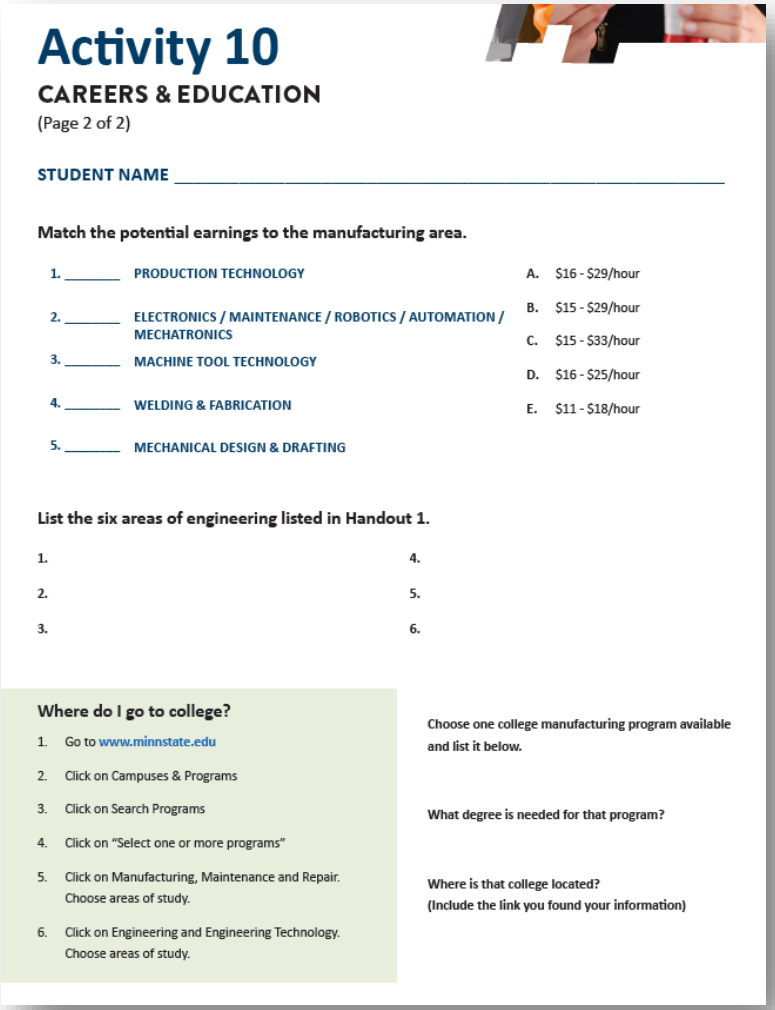
   CO-OWNER

   MOLDING MANAGER

   IT MANAGER

Chapter Three: Careers and Education

- Offers matching positions in manufacturing with salaries
- Students explore manufacturing college programs



Activity 10

CAREERS & EDUCATION

(Page 2 of 2)

STUDENT NAME _____

Match the potential earnings to the manufacturing area.

1. _____ PRODUCTION TECHNOLOGY
2. _____ ELECTRONICS / MAINTENANCE / ROBOTICS / AUTOMATION / MECHATRONICS
3. _____ MACHINE TOOL TECHNOLOGY
4. _____ WELDING & FABRICATION
5. _____ MECHANICAL DESIGN & DRAFTING

A. $16 - $29/hour
B. $15 - $29/hour
C. $15 - $33/hour
D. $16 - $25/hour
E. $11 - $18/hour

List the six areas of engineering listed in Handout 1.

1.
2.
3.
4.
5.
6.

Where do I go to college?

1. Go to www.minnstate.edu
2. Click on Campuses & Programs
3. Click on Search Programs
4. Click on "Select one or more programs"
5. Click on Manufacturing, Maintenance and Repair. Choose areas of study.
6. Click on Engineering and Engineering Technology. Choose areas of study.

Choose one college manufacturing program available and list it below.

What degree is needed for that program?

Where is that college located?
(Include the link you found your information)

Chapter Three: Careers and Education

Activity 13

WHAT'S SO COOL ABOUT MANUFACTURING?

STUDENT NAME _____

1. Now that you know so much about manufacturing in Minnesota, if you were stopped in the street by a reporter and asked, "What do you think is cool about manufacturing in Minnesota?" What would you say?

Mini Challenges

NEW!

Mini Challenges

APPLYING LEARNING AS STUDENTS FINISH THEIR INTRODUCTION TO MANUFACTURING

MINI CHALLENGES

Two mini challenges are female focused & two are gender neutral.

1. INDUSTRIAL PRODUCTS
Focus: Gender Neutral
3-4 Class Periods
PAGES: 40-44

2. LEAN MANUFACTURING
Focus: Gender Neutral
2 Class Periods
PAGES: 45-52

3. AUTOMOTIVE
Focus: Women in Manufacturing
3 Class Periods
PAGES: 53-55

4. ENERGY
Focus: Women in Manufacturing
4-5 Class Periods
PAGES: 56-65

Mini Challenges

Industrial Products

MINI CHALLENGE 1

Gender Neutral

TEACHER INSTRUCTIONS

(Minimally 3 - 4 class periods/60 minutes each class period)

Introduction:

This challenge is a design & problem solving project in the Industrial Products area of manufacturing. The project was created without the need for specialized equipment in the classroom.

Challenge:

Design a sorting process to sort seeds by size and shape. Build a prototype.

Scenario:

A seed company has hired your manufacturing company to solve a problem. Your group is the design team for this project. The seed company needs a way to separate seeds by size and shape in order to increase the speed of their production.

Think of a cob of corn. All the kernels are different sizes. When you purchase corn in a bag or can at the store, the kernels are approximately the same size and shape. The kernels have been sorted in some way. This process can be duplicated with thousands of different applications for many different companies.

Materials for each group:

- Seed Simulation
  - Marbles
  - Small BB's
  - Pea Gravel
  - Seeds: various sizes
- Shoe Box
- X-ACTO® knife
- Scissors
- Cardboard or Tagboard
- Tape
- Hole punch
- Tray
- Funnel
- Paper
- Paper towel or toilet paper rolls

Lean Manufacturing

MINI CHALLENGE 2

Gender Neutral - Lean Manufacturing Impacts Green Manufacturing Technology

TEACHER INSTRUCTIONS

(Minimally 2 class periods/60 minutes each class period)

Introduction:

"Polaris was founded in the small Minnesota town of Roseau, located just south of the Canadian border. Roseau is home to one of the Polaris facilities that handle Snowmobile and ATV production, plastics manufacturing, aspects of engineering and product testing." www.polaris.com/en-us/company/polaris-experience-center.

Challenge:

Manufacture a simulated snowmobile track in order to demonstrate the 7 Wastes of Lean Manufacturing. The project was created without the need for specialized equipment in the classroom. Thousands of different applications for many different companies.

Materials:

- Snowmobile Track - 3 Rubber bands 7 inches X 5/8 inch (black rubber bands would better represent a snowmobile track)
- Lugs - 3 Rubber bands 7 inches X 1/8 inch
- End Caps and Rails - Thin cardboard or tag board (8 ½ inches X 11 inches)
- Sprockets or Bogie Wheels - Paper towel roll
- Axles - Skewers (11.75 inches)
- Scissors or a tool to cut (wire cutter) the wood skewers
- Pen
- Pencil
- Marker
- Glue gun and glue sticks
- Ruler
- Compass
- Small box or bowl to put scraps in

Mini Challenges – Women in Manufacturing

- Incorporates our career videos designed by women for women to show them women in leadership in manufacturing
- Offers a challenge of problem solving surrounding a societal problem through manufacturing.

MINI CHALLENGES

Energy & Resources

MINI CHALLENGE 4

Women in Manufacturing

TEACHER INSTRUCTIONS

(Minimally 4 - 5 class periods/60 minutes each class period)

Introduction:

Minnesota's own Wyoming Machine www.wyomingmachine.com is located in Stacy, Minnesota! Wyoming Machine is a Precision Sheet Metal Fabrication Company owned and operated by two sisters, Lori and Traci Tapani (Co-Presidents).

Present the video (5 minutes) of Wyoming Machine co-presidents as they showcase their business and what is made at Wyoming Machine to your students.

The video can be found on YouTube at www.youtube.com/watch?v=G54ii8Lgpz0

Challenge:

The energy and resources challenge is a manufacturing research and design team simulation to solve a problem the students identify through strategy mapping. The goal is to have students solve a societal problem through manufacturing. The video *Engineering is Saving the World with Cookstoves* is an example of how a social issue was solved through manufacturing and engineering.

Materials:

- Magazines (National Geographic, pop culture, etc.)
- Local and national newspapers (within the last year)
- Post-it® Notes
- Highlighters – various colors
- Pens or pencils – various colors
- Large flip chart
- K'NEX®
- LEGO® bricks
- Pipe cleaners
- Play dough or clay
- Cotton balls
- Tongue depressors
- Straws
- String
- Plastic or paper cups
- Paper plates
- Rubber bands
- Tape
- Funnel
- Small boxes
- Scissors
- Coffee filters
- Other miscellaneous items such as knick-knacks from around your home.

Answer Key

ANSWER KEY

Answer Key

CHAPTER 1 / WHAT IS MANUFACTURING?

ACTIVITY 1: Manufacturing Terms & Definitions

NOTES FOR CHAPTER 1, ACTIVITY 1

There is a PowerPoint for review of definitions with additional information in the notes section.

1. F	5. I	9. D
2. B	6. G	10. E
3. I	7. A	11. J
4. H	8. C	12. K

HANDOUT 1: The Manufacturing Cycle

Provide students with a copy of the Manufacturing Cycle.
There is a PowerPoint to assist with the explanation of the Manufacturing Cycle.

ACTIVITY 2: The Manufacturing Cycle

NOTES FOR CHAPTER 1, ACTIVITY 2

The manufacturing cycle is something that is repeated throughout the manufacturing process — manufacturers not only need to follow the process to create new products, but also stay on top of new regulations, market studies, how their product compares to similar products, and the most productive ways to make their goods.

You can also note that the Design & Development stage includes the "test" stage. For MaxBat, their process begins by monitoring their wood drying process, then testing the moisture content, selecting the best "blanks," then testing it again for weight and flaws. After the second inspection, the wood is sanded, and then inspected before staining. After staining, it is again inspected before finishing the bat. It is then again weighed and inspected before reaching the Distribution stage.

Note: For the items with multiple answers, the order doesn't have to matter as the students are applying these items to the manufacturing cycle.

1. Distribution (E)
2. Production (C)
3. Marketing (D)
4. Research & Marketing Analysis (A)
5. Marketing (D)
6. Research & Marketing Analysis (A)
7. Design & Development (B)
8. Design & Development (B)
9. Production (C)
10. Distribution (E)
11. Product Support & Sales (F)
12. Marketing (D)

The sources for this activity can be found at:
www.maxbats.com
www.woodworking.com

Additional Resources and Acknowledgements

RESOURCES

Additional Resources

Minnesota Manufactured
www.mnmfg.org
Information about manufacturing careers, including information for students and educators.

Minnesota Manufactured - YouTube
https://www.youtube.com/channel/UCZoupOU31eiP9wfBkmRp4Eg
Videos on YouTube (Click on playlists.)

MN Department of Education
https://education.mn.gov/MDE/dse/stds/stem/

PBS Kids - Rubber Band Car
www.pbskids.org/designsquad/build/rubber-band-car

Minnesota STEM Teacher Center
www.scimathmn.org/stemtc

eGFI (Engineering, Go For It!)
www.egfi-k12.org
An interactive website that offers information about engineering.

I WAS wondering...
www.iwaswondering.org
A website designed to help you learn more about science and engineering.

Try Engineering
www.tryengineering.org/play-games
A website designed to engage students to learn about what engineering is by the use of games.

Trades Gamer
www.tradesgamer.com
This website provides students a way to learn about welding through the TIG welder game.

The Manufacturing Institute
www.themanufacturinginstitute.org
Affiliated with the National Association of Manufacturers, the Manufacturing Institute provides information about manufacturing in United States.

O*NET
www.onetonline.org

ACKNOWLEDGMENTS

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WE'D ALSO LIKE TO THANK THE FOLLOWING FOR THEIR CONTRIBUTION TO THIS BOOK:

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- Rebecca Thomas, MRG Tool & Die
- Inger Wegener, University of Minnesota Twin Cities
- Bemidji State University, Bemidji, Minnesota
- BTD, Detroit Lakes, Minnesota
- Central Boiler/ALTOZ, Greenbush, Minnesota
- Clow Stamping, Coon Rapids, Minnesota
- Douglas Machine, Alexandria, Minnesota
- Douglas Scientific, Alexandria, Minnesota
- Dynamic Group, Coon Rapids, Minnesota
- Graphic Packaging, Crosby, Minnesota
- Jones Metal, Mankato, Minnesota
- Lakeland Mold, Brainerd, Minnesota
- Marvin Windows and Doors, Warroad, Minnesota
- MaxBat, Brooten, Minnesota
- MRG Tool & Die, Faribault, Minnesota
- Pequot Tool & Manufacturing, Jenkins, Minnesota
- WSI Industries, Monticello, Minnesota

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GOLD: MPMA, tri-state

SILVER: Minnesota Employment and Economic Development, West Central Initiative, MMA

Industry Uses

- Manufacturers can reach out to local schools to offer this resource and start a partnership.
- Sponsor promotion of this guide and future editing and distribution.
- Use when volunteering or presenting at a career fair to show the different positions and happy employees.

Educator Uses

- Comprehensive curriculum for Science, Technology, or Language Arts
- Great for alternative schools or programs that offer more flexibility with curriculum
- Full of engaging projects with minimal materials
- Resource for robotics coaches to enhance their programs
- Enhance Statewide Tour Field Trip
- Further ways to engage with students making the connection to careers such as our badge pathway, career videos and more on our website
- Excellent resource for Career Counselors to use, especially Chapter three

- **Questions?**
- **Comments?**
- **Feedback!**

MINNESOTA STATE
Advanced Manufacturing Center of Excellence

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Upcoming Webinar

Statewide Tour of Manufacturing, FOR EDUCATORS and INDUSTRY
This Webinar will provide an overview of the annual Statewide Tour of Manufacturing. Each October we reach out to manufacturers and schools throughout the state and offer free funding for field trips to tour manufacturing facilities in their area and see first-hand what career opportunities are available in manufacturing and to meet local employers. We will walk you through the website, funding application, overall event process and how to spread the word or participate in this annual statewide event

September 17, 2020, 1:30-2:30

Register:
https://minnstate.zoom.us/webinar/register/WN_vpsm3DlnSrOcOEP2NRqIDw

THANK YOU!

Find more information at:

mnmfg.org