Be creative and innovative

Enjoy a family-friendly career with competitive salaries and benefits

MAKE YOUR FUTURE:

United States Manufacturing Industry

A practical guide for students and their families

Make life safer and easier for people

NAPE
National Alliance for Partnerships in Equity Education Foundation

Over the next decade, the United States will need to fill nearly 3.5 million manufacturing jobs, but 2 million jobs may go unfilled because we do not currently have enough people trained to do them.[1]

Opportunities!

Manufacturing is an exciting, creative, and high-tech field. You can use advanced manufacturing technologies to help the US remain a world leader in innovation. It will also keep our economy strong and continue to provide a lot of jobs.

All the technology you enjoy, nearly every object you use or wear and many of the foods you eat are manufactured. Creating products requires lots of people with a variety of skills and interests working with a team of people. You can apply your skills and passions in a career in manufacturing!

A career in manufacturing can be very rewarding. You can be part of a team that uses or invents new processes and materials to make futuristic products using technologies that didn't even exist a few years ago. Modern manufacturing is also making products on-demand to reduce waste and protect our environment. Turning an idea into a product requires a wide range of skills, so careers are varied based on your team's role in the manufacturing process.

This workbook is designed to help students and their families understand the many opportunities for careers in manufacturing. Learn about how a career in manufacturing can help you achieve your future goals!

"Manufacturing today is much more about brains than brawn. And along with being high-tech, most manufacturing jobs are high-paying."

ALLISON GREALIS
Director of Women in Manufacturing[4]

Sabrina

Meet Sabrina.

After deciding cosmetology wasn't the career for her, Sabrina selected the career of welding because she wanted a hands-on job. She learned a lot in just 2 years thanks to hard work and the inspiration of her instructor. She was the only female and was the first person in her class to receive her OSHA (Occupational Safety and Health Administration) certificate and two welding certifications. Sabrina furthered her education by going to Hobart Institute of Welding Technology, with the help of scholarships from the Troy Foundation. **"Being the only female in a man's working environment has made me stronger and more confident about my work."** Sabrina also creates pieces of art with her welding skills! Sabrina is passing her passion for welding on to the next generation by working with Girl Scouts to inspire girls to consider a career in the manufacturing industry.

12.3 million
people work in manufacturing jobs[1]

10%
of manufacturing workers are black or African American[5]

16.6%
of manufacturing workers are Hispanic or Latino[5]

29%
of manufacturing workers are women[5]

Dream It!

What kinds of students might like a future in manufacturing?

STUDENTS WHO ENJOY
turning ideas into reality

STUDENTS WHO WANT TO
make life easier for others

STUDENTS WHO ENJOY
problem-solving with a team

STUDENTS WHO ENJOY
working with advanced technologies

Ever had an idea and wondered how you could make it a reality? **Manufacturing is your answer.** People in manufacturing work together to transform ideas into products, and today's entrepreneurs and dreamers are using unique methods and new technologies to produce their products.

Manufacturing companies need people from diverse backgrounds with a wide variety of experiences, knowledge, and training to do a lot of different jobs from planning and design to production, distribution, and sales. People with a wide range of educational experiences, skills, and passions can enjoy high-paying jobs with opportunities for advancement.

Educational requirements vary significantly based on the job. Generally, entry- to middle-level positions provide on-the-job training, require certification in a technical area, or require a 2-year degree in a relevant field. People who go into manufacturing major in many fields, including engineering (mechanical, electrical, industrial, chemical, or process engineering), robotics, food science, clothing and textiles, computer systems, life science, physical science, physics, information technology, and business studies. Teams of people with various skills and education work together to plan, produce, and distribute manufactured products.

Explore It!

Look at the many teams in this manufacturing operation and how they all work together to make sure we have access to safe, useful, and high-quality products.

Each team member's expertise and technical skills contributes to turning an idea into a product. Below, check out some of the jobs these team members do. The icons show how various team members are involved throughout the manufacturing process.

High School Diploma

Production Associate

Work on the plant floor. Can be assembly team workers, upholsterers, food processing workers, or work in shipping and receiving.

Operator

Set up and operate machines such as semi-conductor fabrication equipment, Computer Numerical Control (CNC) Equipment, lathes, cutters, borers, mills, grinders, drills, forklifts, as well as other process control equipment.

Apprenticeship, Certification or Associate Degree

Machinist

Use knowledge, skill and machine tools such as lathes, milling machines, shapers, or grinders to make precision parts.

Computer Numerical Control Technician

Program, set up and operate machines that convert designs produced by Computer Aided Design (CAD) into finished parts.

Advanced Manufacturing Technician

Ensure machines, robotics, automation, and equipment are running efficiently and safely.

Welder

Use welding equipment to assist in manufacturing assembly and production.

75%
of manufacturers are small: < 20 employees[1]

30 million jobs
with a median salary of $55,000 that don't require a bachelor's degree[6]

$27/hour
manufacturing workers earn on average[7]

Associate Degree or Bachelor's Degree

Marketing/Sales

Understand customer requirements, promote the sale of company products, and provide sales support.

Supply Chain/ Logistics

Oversee the manufacturing flow from supplier of raw materials to finished product delivered to the customer.

IT professional

Design and maintain computer systems that support the manufacturing operations. Can also help with data analysis from marketing and sales. Can support logistics for organizational communication.

Engineers
(Electrical, Mechanical, Industrial)

Design products or processes for making products and use CAD and Computer Aided Manufacturing (CAM) for modeling products and production processes.

Quality Control

Manage the safe and efficient production of products. Use measurements, charts, statistics, and math to ensure the products are safe, reliable, and accurate.

Advanced Degree

Industry and/or materials experts

Develop new uses for materials in products, ensure safety, provide expert guidance in a type of manufacturing or material, (e.g. metal and alloys, ceramics and glass, plastics and polymers).

Plan It!

Individuals working in the manufacturing industry often have an entrepreneurial spirit, strong creative thinking and problem-solving skills, and science, technology, engineering, and math (STEM) skills.

In manufacturing, you have many choices about pathways to take, with a variety of jobs for people with diverse interests and talents. While some people want to get to work right away through an apprenticeship or internship, others plan to attend a two or four-year college.

Many states have mapped out pathways to help you pursue careers in manufacturing. Depending on your interest and training, you can enter the pathway at any level or work your way up throughout your career by earning more credentials, certificates, or degrees. Some manufacturing pathways start as early as middle school.

High school pathways also help you fulfill graduation requirements and can lead to industry-recognized credentials and possible college credit. For more information about the opportunities at your school or local career center, talk with your school counselor or a recruiter from your local career center.

Federation for Advanced Manufacturing Education (FAME) and the Advanced Manufacturing Technician Program (AMT)

FAME, the Federation for Advanced Manufacturing Education, is a collaborative of nearly 300 employers across the nation who work together to participate in and support the Advanced Manufacturing Career Pathways, including the Advanced Manufacturing Technician (AMT) Program. The AMT Program is a new kind of industry/education partnership in which employers and educators work closely together as a team to develop new talent with the goal of producing the global best new-to-field technician at the point of graduation. Currently, the program is in 11 states, 27 community college campuses, and 4 universities.

Students accepted into the AMT Program will start a work/study program to earn an associate degree and certification as an AMT. Students attend classes at a local community college two days a week (8 hours or more each day) and work at least 24 hours a week (8 hours or more each day for three days) for a local, sponsoring employer – all while being paid a competitive wage for their work. After five semesters, students will have earned an associate degree, 65-79 college credit hours (depending on location), two years of highly valuable work experience and the AMT certification. At that point, students will be ready to enter the workforce full-time with the skills needed to succeed—and with the potential of graduating college debt free!

For more information about FAME and the AMT Program, go to http://fame-usa.com/

"The AMT program has taught me invaluable lessons. I moved to the United States with my family, seeking opportunities for each of us, not very hopeful that I could be successful. Closer to my High School graduation I knew I wanted to pursue a technological career path, but I had various economical limitations. The AMT program helped me earn not only a degree, but also experience from a world class company as Toyota is.

I was "book-smart" but I lacked real-world experience. This program helped me put into practice all I learn such as how to wire and troubleshoot electrical, pneumatic and hydraulic circuits. I also learned the importance of soft skills and how crucial is effective communication to explain a problem to others.

This program led me to a successful career. I plan to further my education while I work for Toyota. I intend to keep ascending and contribute more to Toyota's technological advancements in the future."

~ Paula

"Manufacturing is about incredible new technologies: 3-D printing, nanoscale chemistry, energy efficiency, satellite technology, medicines that are saving lives and changing the world. Manufacturing is as much about tomorrow as yesterday—with endless opportunities for everyone."

JAY TIMMONS
CEO of the National Association of Manufacturers (NAM)[8]

Manufacturing jobs in the United States hold great promise for students!

Start now! NAPE designed this workbook to be a useful tool for students and their families to explore resources and opportunities available across the country. We wish you the very best in your future educational and career pursuits, and we look forward to seeing you in the manufacturing industry!

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"The moment I first heard of the AMT program marks the point in my life when I figured out what I wanted to do after I graduated high school. I had been considering a wide range of career paths up until then, none of them having anything to do with maintenance, however, the potential to be hired on at the end of this two year program was too good of an opportunity to pass up. Now that I am in the middle of my schooling, I can say that I made the right choice. I have learned an incredible amount over the course of a year and know that I will only continue to learn more as time goes on. I would highly recommend the AMT program for any student with an interest in a practical college education."
~Mollie

Meet Tanya.

"I love seeing machines make things…from a manufacturing print on a piece of paper to 'making a machine sing' to producing a detailed, intricate part from a solid piece of material," says Tanya DiSalvo, President of Criterion. Her company produces parts for the "no failure" industries—medical devices, aerospace, nuclear, laser and photonics—so the work they do really makes a difference in people's lives. Tanya's grandfather started Criterion in 1953. **"When I started, I had to overcome stereotypes and show I was more than the girl who served coffee. I had to prove I was capable, work my way up through shipping & receiving, business development, and operations."** Tanya works hard to create pathways for students and adults from diverse racial and ethnic backgrounds.

NAPE is the nation's leading professional alliance for **access**, **equity**, and **diversity** in education, training, and careers.

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