

Sector Overview

Manufacturing – “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.”¹

As stated in the *White House Strategy for American Leadership in Advanced Manufacturing*, “the United States has long thrived on its ability to manufacture goods and sell them in domestic and global markets. Manufacturing plays a vital role in almost every sector of the U.S. economy, stretching from aerospace to pharmaceuticals and beyond. Advanced manufacturing—which includes both new manufacturing methods and production of new products enabled by innovation—is an engine of America’s economic power and a pillar of its national security. Advances in manufacturing enable the economy to continuously improve as new technologies and innovations increase productivity, enable new products, and create entirely new industries.”² There are many examples of advanced manufacturing tools and techniques, but some of the more prominent ones include computer-aided design (CAD), simulations, robotics, laser and enhanced prototyping.³ Indeed, advanced manufacturing has changed considerably since the dawn of the industrial age or the introduction of the assembly line.

Advanced manufacturing is a high-growth sector in Louisiana and across the nation. “Over the next decade, manufacturing employers need to fill 533,000 middle-skilled jobs that currently pay at least \$35,000 per year.”⁴ Some argue that Louisiana specifically is at the epicenter of the U.S. manufacturing renaissance.⁵ Despite the growing demand and anticipated growth, some groups (e.g., women) are underrepresented in the sector. Currently, women hold only 7% of advanced manufacturing jobs in the country⁶ but leaders like Marilyn Hewson, CEO of Lockheed Martin, and Phebe Novakovic, CEO of General Dynamics, are paving the way for the next generation.

Questions to consider about the sector:

- What role does advanced manufacturing play in the global economy? US? State?
- How have new developments in technology changed the advanced manufacturing sector? What new possibilities exist given these new developments in technology?
- How are the realities of advanced manufacturing potentially different than traditional views held about the manufacturing sector?
- What is the range of careers within the advanced manufacturing sector?
- What advanced manufacturing companies are located in your region and your state?
- What skills, competencies and dispositions will be necessary for future jobs in the Advanced Manufacturing

¹ <https://careertech.org/manufacturing>

² <https://www.whitehouse.gov/wp-content/uploads/2018/10/Advanced-Manufacturing-Strategic-Plan-2018.pdf>

³ <https://choosecolorado.com/wp-content/uploads/2016/06/CO-Advanced-Manufacturing-Profile.pdf>

⁴ <https://womenandgoodjobs.org/sector/advanced-manufacturing/>

⁵ <https://www.opportunitylouisiana.com/key-industries/advanced-manufacturing>

⁶ <https://womenandgoodjobs.org/sector/advanced-manufacturing/>

sector?

- What post-secondary opportunities are necessary for jobs in the Advanced Manufacturing sector?

Clusters, Pathways and Certifications

- [Career Cluster Frame](#)
- Jump Start pathways: Manufacturing Specialist; Manufacturing, Construction Crafts & Logistics
- Jump Start certifications: [Certification for Manufacturing \(C4M\)](#)

Resources

The resources below may support teacher and/or student learning about the Advanced Manufacturing sector. Teachers should select excerpts from the materials below to share with students based on the students' abilities and interests and/or identify additional resources to share.

Lexile Range: 800 - 1800

Research Papers

These are most appropriate for building teacher background knowledge, though carefully selected excerpts, infographics, etc. might be useful for student use. Teachers should consider student reading levels, prior knowledge, relevance of text, and available classroom supports in making text selections.

- [America's Advanced Industries](#) (1400L-1500L)
- [Strategy for American Leadership in Advanced Manufacturing](#) (1500L-1600L)

Articles

- [Low-skilled workers having toughest time in economic globalization](#) (820L)
- [US Manufacturing, Statistics, and Outlook](#) (800L-900L)
- [3-D Printers use Lasers to Make Jet Engine Parts](#) (890L)
- [Meet Flippy, a burger-flipping robot alternative to human workers](#) (900L)
- [A Brief Timeline of American Manufacturing Industry Moments & Innovations](#) (900L-1000L)
- [Careers: Industrial production manager](#) (1060L)
- [Types of Manufacturing Industry](#) (1000L-1100L)
- [Examples of Mass-Produced Products](#) (1000L-1100L)
- [Mech-a-what? Mechatronics – the Engineering Field You Didn't Know Existed](#) (1100L-1200L)
- [6 Exciting Advances in Manufacturing Automation](#) -(1100L-1200L)
- [Advanced Manufacturing](#) (1200L-1300L)
- [Explore Careers in Advanced Manufacturing](#) (1400L-1500L)
- [Women in manufacturing Stepping up to make an impact that matters](#) (1600L - 1700L)
- [Women in manufacturing study Exploring the gender gap](#) (1700L - 1800L)



Advanced Manufacturing

Text Sets

- [Rise of the Robots: Helpful Or Harmful?](#) Some texts available in Spanish - (810L-980L)
- [Robotics: Argument & Debate Unit](#) Some texts available in Spanish - (820L-950L)

Fact Sheets

- [Louisiana Manufacturing Facts](#) (1200L-1300L)

Videos

- [Advanced Manufacturing Overview from Lockheed Martin](#)
- [The Future of Manufacturing from Carnegie Mellon University](#)
- [How it's Made: Ice Cream](#)
- [How it's Made: Hotdogs](#)

Other

- [Manufacturing Your Future Advanced Manufacturing lesson plans and materials](#)
- [How Products Are Made website that explains the details and manufacturing process of a wide variety of products](#)
- [Manufacturing Day, an organization that connects teachers and students to the manufacturing industry](#)

