



Workforce and Career-Ready Learning in Out-of-School Time (OST): Manufacturing

The Shapiro Administration has prioritized five key industries to bolster Pennsylvania's economic development over the next decade—Agriculture, Energy, Life Sciences, Manufacturing, and Robotics and Technology. Out-of-school time (OST) programs provide a critical opportunity to connect students to these high-growth sectors early, building awareness, foundational skills, and real-world experiences that align education with workforce needs.

Why Manufacturing Matters in Pennsylvania

Manufacturing is one of Pennsylvania's five priority industry sectors identified by Governor Josh Shapiro because it drives innovation, economic growth, and family-sustaining careers across the Commonwealth. Pennsylvania's manufacturers produce everything from advanced medical devices and robotics to food products, chemicals, metals and transportation equipment.

Manufacturing by the Numbers

- **\$45.9 billion** in manufactured goods exported worldwide in 2024.
- Manufacturing exports supported an estimated **140,000 Pennsylvania jobs**.
- More than **560,000 Pennsylvanians** work in manufacturing.
- Manufacturing contributes **more than \$116 billion** annually to Pennsylvania's economy.
- **Pennsylvania** ranks among the nation's **leading** manufacturing states.
- **More than 12,000** manufacturing establishments operate across the Commonwealth.
- **Manufacturing careers** include engineering, robotics, automation, artificial intelligence, logistics, machining, quality control, supply chain management, welding, electronics, and skilled trades.



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Pennsylvania's Top Manufacturing Exports

Industry	2024 Exports
Chemicals	\$13.8 Billion
Computer and Electronic Products	\$6.3 Billion
Machinery (Except Electrical)	\$4.6 Billion
Primary Metal Manufacturing	\$4.3 Billion
Transportation Equipment	\$3.6 Billion

Manufacturing Careers are Changing

Today's manufacturing facilities rely on advanced technologies including:

- 3D Printing
- Artificial Intelligence (AI)
- Automation
- Computer-Aided Design (CAD)
- Data Analytics
- Industrial Internet of Things (IIoT)
- Robotics
- Smart Manufacturing

These careers increasingly require strong STEM knowledge, creativity, collaboration and lifelong learning.

How OST Programs Support Career Pathways in Manufacturing

High-quality afterschool and summer programs provide students with early exposure to manufacturing careers by helping them develop technical knowledge and durable workforce skills through hands-on learning.

OST programs help youth build:

- Critical thinking and problem-solving.
- Engineering design and innovation.
- Robotics and automation skills.
- Computer programming and coding.
- Artificial intelligence literacy.
- Teamwork and communication.
- Digital literacy.
- Precision, safety and quality practices.
- Career exploration and work-based learning experiences.

Research shows students who engage in career-connected learning are more likely to pursue STEM education and enter high-demand workforce sectors.

High-quality OST programs can strengthen Pennsylvania's manufacturing workforce pipeline by:

- Introducing manufacturing careers beginning in elementary school.
- Connecting youth with local manufacturers and industry professionals.
- Providing hands-on STEM and engineering activities.
- Supporting apprenticeships and career exploration.
- Developing durable skills employers value.
- Engaging families in career awareness opportunities.
- Building partnerships with schools, employers, workforce boards, and community organizations.

PSAYDN Workforce Connection

The Pennsylvania Statewide Afterschool/Youth Development Network (PSAYDN) supports career-connected learning opportunities that prepare young people for Pennsylvania's priority workforce sectors. Through afterschool and summer programs, youth gain the skills, experiences and confidence needed to become the next generation of Pennsylvania's manufacturing workforce.

Investing in high-quality out-of-school time today helps build Pennsylvania's manufacturing workforce tomorrow.

Support OST Programs that Connect Youth to High-Demand Manufacturing Careers in Pennsylvania.

Policymakers, funders, and partners can help by:

- **Funding OST programs aligned to career-ready learning.**
- **Expanding partnerships between schools, industry, and workforce agencies.**
- **Advocating for resources that prepare the next generation of energy professionals.**



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