



# Career and Technical Education (CTE) Middle School Competencies

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Career Cluster:

**M48-Advanced Manufacturing**

May 2026



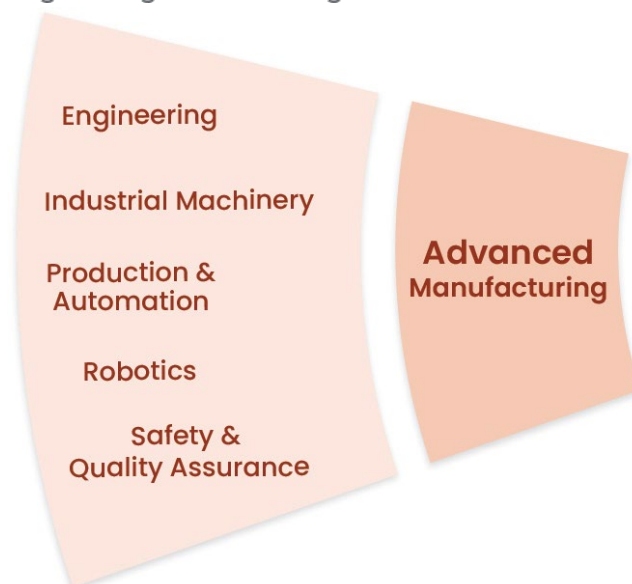
# M48-Advanced Manufacturing: Engineering and Producing Tomorrow's Solutions

**Cluster Definition:** The Advanced Manufacturing Career Cluster blends innovative technologies and practices to enhance design and production. It covers areas such as engineering, research and development, automation and artificial intelligence, equipment maintenance, safety protocols, and quality control. This Cluster aims to increase efficiency, reduce waste, ensure safety, and produce high-quality goods, driving the industry's growth and adapting to modern demands.

## **Sub-Clusters:**

- Engineering
- Industrial Machinery
- Production & Automation
- Robotics
- Safety & Quality Assurance

More details can be found at [Advanced Manufacturing - Advance CTE](#)



## Middle School Competencies

The MS Instructional Design form will be used to communicate the delivery model of the program, which will also be entered into the Career and Technical Education Information System (CTEIS).

Competency Code	<b>M48 Advanced Manufacturing Middle School Competency Statements</b>
<b>M1</b>	Evaluate industry safety protocols by identifying common manufacturing hazards (e.g., improper machine guarding, chemical exposure, or unsafe material handling) and applying safe behaviors such as PPE use, equipment lockout awareness, and clear workspace organization.
<b>M2</b>	Explain the roles and responsibilities of professionals across advanced manufacturing sub-clusters—such as process technicians, machine operators, robotics specialists, and quality assurance teams—and how they collaborate throughout production.
<b>M3</b>	Analyze manufacturing systems by comparing how different materials, tools, and automated technologies influence production speed, precision, and product consistency.
<b>M4</b>	Apply measurement, calibration, and basic technical drawing skills to interpret simple schematics, verify dimensions, and support accurate fabrication tasks.
<b>M5</b>	Differentiate between types of manufacturing equipment—such as CNC devices, 3D printers, robotic arms, and inspection tools—and describe routine maintenance practices that keep machines reliable and safe.
<b>M6</b>	Create small-scale manufacturing projects—such as simple machined parts, 3D-printed components, or automated mechanisms—using safe procedures, teamwork, and iterative problem-solving to model real production processes.
<b>M7</b>	Assess quality assurance practices by examining how inspections, product testing, and data recording ensure products meet manufacturing standards and customer needs.
<b>M8</b>	Explore careers in the Advanced Manufacturing Career Cluster and connect these roles to personal interests, strengths, and future goals.

## Advance CTE Career Ready Practices

Career Ready Practices, built on a meta-analysis of over 30 different listings of general professional skills developed by industry and educational institutions, represent the skills needed to succeed in the modern workplace. These practices should be embedded across the pre-kindergarten to workforce continuum. Refer to the [Advance CTE Career Ready Practices](#) document for more detailed information.

<b>Competency Code</b>	<b>Career Ready Practices</b>
<b>CRP 01</b>	Lead as a contributing and professional employee
<b>CRP 02</b>	Communicate clearly, effectively, and with reason
<b>CRP 03</b>	Think critically to make sense of problems and persevere in solving them
<b>CRP 04</b>	Collaborate productively while using cultural and global competencies
<b>CRP 05</b>	Use digital skills and technologies to enhance productivity and make data-informed decisions
<b>CRP 06</b>	Remain resilient in a changing workplace and world of work
<b>CRP 07</b>	Manage time and space effectively
<b>CRP 08</b>	Demonstrate a creative and innovative mindset
<b>CRP 09</b>	Act as a good steward of organizational and personal finances and resources
<b>CRP 10</b>	Navigate an education and career path aligned to strengths, work style, interests, and goals
<b>CRP 11</b>	Consider the environmental and social impacts of decisions
<b>CRP 12</b>	Apply appropriate academic and technical skills