



**CERTIFIED MANUFACTURING  
ASSOCIATE  
BODY OF KNOWLEDGE**



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# MANUFACTURING ASSOCIATE

## BODY OF KNOWLEDGE 2026

Topics	Competency	Importance	Weightings
<b>1. Shop Essentials (Applied Mathematics)</b>			11%
1.1 Mathematical Fundamentals	Apply Information	High	
1.1.1 Perform calculations involving addition			
1.1.2 Perform calculations involving subtraction			
1.1.3 Perform calculations involving multiplication			
1.1.4 Perform calculations involving division			
1.2 System of Measurement	Apply Information	High	
1.2.1 Read measurements taken with a tape measure			
1.2.2 Perform calculations involving common English units			
1.2.3 Perform calculations involving metric units			
1.2.4 Perform conversions between metric units and English units			
1.3 Fractions and Decimals	Apply Information	High	
1.3.1 Perform calculations involving fractions			
1.3.2 Perform calculations involving decimals			
1.3.3 Perform conversions between fractions and decimals			
1.3.4 Perform calculations involving percentages			
<b>2. Safety</b>			25%
2.1 Introduction to OSHA	Remember & Understand	High	
2.1.1 Describe the role of OSHA in promoting workplace safety			
2.2 OSHA Regulations: PPE	Understand & Apply Information	High	
2.2.1 Describe OSHA regulations for personal protective equipment (PPE)			
2.2.2 Determine PPE requirements for common workplace situations			
2.3 OSHA Regulations: Lockout/Tagout	Understand & Apply Information	High	
2.3.1 Describe OSHA regulations regarding lockout/tagout procedures			

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2.3.2 Describe OSHA regulations regarding energy isolation			
2.3.3 Determine how lockout/tagout principles apply to common workplace situations			
2.4 OSHA Regulations: Hazardous Materials	Remember & Understand	High	
2.4.1 Describe OSHA regulations regarding hazardous materials			
2.4.2 Describe Safety Data Sheets (SDS) and how they impact daily operations in the workplace			
2.5 OSHA Regulations: Fire Safety	Remember & Understand	High	
2.5.1 Describe OSHA regulations regarding fire safety			
2.5.2 Describe the impact of fire safety regulations on daily operations in the workplace			
2.6 OSHA Regulations: Bloodborne Pathogens	Remember & Understand	High	
2.6.1 Describe OSHA regulations regarding bloodborne pathogens			
2.6.2 Describe the impact of bloodborne pathogen regulations on daily operations in the workplace			
2.7 Hand and Power Tools Safety	Understand & Apply Information	High	
2.7.1 Determine safe practices for using hand and power tools in the workplace			
2.8 Basic Equipment Safety	Understand & Apply Information	High	
2.8.1 Describe common types of machine guards and how they protect employees from injury			
2.8.2 Identify common types of e-stops			
2.8.3 Describe safety practices for working around forklifts, trucks, and other industrial vehicles			

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<b>3. Quality</b>			<b>8%</b>
3.1 Quality Overview	Remember & Understand	High	
3.1.1 Describe the importance of quality across different departments of an organization			
3.1.2 Describe the use of quality management systems and tools in manufacturing processes and products			
3.2 Troubleshooting	Understand & Apply Information	High	
3.2.1 Describe common troubleshooting methods, including 5 Why's technique, brainstorming, documentation, and troubleshooting teams			
3.2.2 Describe tools that are used to collect and interpret data, including check sheets, fishbone diagrams, and Pareto charts			
3.2.3 Apply troubleshooting methods and tools to basic workplace situations			
<b>4. Lean/Continuous Improvement</b>			<b>7%</b>
4.1 Lean Manufacturing Overview	Remember & Understand	Medium	
4.1.1 Describe the different forms of waste			
4.1.2 Describe the concept of value-added activities			
4.1.3 Describe the importance of continuous improvement			
4.2 5S Principles	Understand & Apply Information	High	
4.2.1 Describe the 5S principles (sort, set in order, sweep, standardize, sustain)			
4.2.2 Apply each 5S principle to examples in the workplace			

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<b>5. Inspection</b>			10%
5.1 Inspection Instruments and Gages	Understand & Apply Information	High	
5.1.1 Describe the use and care of common inspection instruments and gages			
5.1.2 Identify basic caliper types and their uses, including dial, digital, and vernier calipers			
5.2 Part Tolerancing	Remember & Understand	Medium	
5.2.1 Describe common methods used for part tolerancing			
5.2.2 Describe the impact that tolerances have on part production and quality			
5.3 Print Reading	Understand & Apply Information	High	
5.3.1 Read and interpret different views and features on a print			
5.3.2 Describe common types of drawings used in manufacturing operations			
<b>6. Assembly and Joining</b>			9%
6.1 Overview of Common Assembly and Joining Processes	Remember & Understand	Medium	
6.1.1 Describe common assembly and joining processes, such as fastening, welding, bonding, and soldering			
6.2 Fastener Types and Installation Methods	Remember & Understand	Medium	
6.2.1 Identify common types of tools used with fasteners			
6.2.2 Describe the advantages and disadvantages of common assembly tools and methods			
6.3 Safety for Assembly	Understand & Apply Information	High	
6.3.1 Describe best practices for safely assembling components and how these practices apply to common assembly tasks			
6.3.2 Describe proper ergonomic practices for assembly tasks			

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Topics	Competency	Importance	Weightings
<b>7. Introduction to Manufacturing Processes</b>			12%
7.1 Overview of Common Machining Processes	Remember & Understand	High	
7.1.1 Identify common machining equipment, including saws, lathes, mills, and drill presses			
7.1.2 Describe the processes performed using saws, lathes, mills, and drill presses			
7.2 Overview of CNC Machine Tools and Components	Remember & Understand	High	
7.2.1 Identify the major components of a CNC lathe			
7.2.2 Identify the major components of a CNC mill			
7.3 Overview of Additive Manufacturing	Remember & Understand	Medium	
7.3.1 Describe the advantages and disadvantages of additive manufacturing			
7.3.2 Describe common applications of additive manufacturing			
<b>8. Robotics</b>			7%
8.1 Overview of Industrial Robots	Remember & Understand	High	
8.1.1 Describe the basic types of industrial robots			
8.1.2 Describe applications for industrial robots			
8.1.3 Describe common methods used to program industrial robots			
8.2 Robot Safety	Understand & Apply Information	High	
8.2.1 Identify methods for preventing robot accidents			
8.2.2 Describe safeguarding systems and how they protect employees from injury when working with robots			

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<b>9. Smart Manufacturing</b>			5%
9.1 Smart Manufacturing Fundamentals	Remember & Understand	Medium	
9.1.1 Describe the Industrial Internet of Things (IIoT) and the benefits of connected systems in manufacturing			
9.1.2 Describe the importance of sensors and data collection for improving manufacturing processes			
9.1.3 Describe common applications of artificial intelligence (AI) in modern manufacturing			
<b>10. Workforce Essentials</b>			6%
10.1 Listening Skills and Written Communication	Remember & Understand	High	
10.1.1 Describe the importance of active and empathetic listening in the workplace			
10.1.2 Describe the key characteristics of clear and concise written communication			
10.2 Handling Communication Obstacles	Remember & Understand	High	
10.2.1 Recognize common causes of workplace conflicts			
10.2.2 Describe strategies for resolving workplace disagreements respectfully			