CURRICULUM MAPPING TEMPLATE

Program: Welding, Brazing and Soldering CIP CODE: 48.0508

Segment	CTE Segments/Performance Elements	CTE Concepts	Math Concepts	Common Core Math Standards Middle School	Common Core Math Standards High School
1	**Occupational Orientation**				
	American Welding Society **A. Module 1: Occupational Orientation** 1. Prepare time or job cards, reports, or records. 2. Perform housekeeping duties (shop maintenance). 3. Follow verbal instructions to complete work assignments. 4. Follow written details to complete work assignments.	Time card	Whole numbers: Add, subtract, multiply (1) Decimals: Add, subtract, multiply (1) Customary Measure: Time (1)	7.EE.3; 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3	A.APR.1; A.APR.7; N.RN.3; N.Q.1
	Production **D. Coordinate work teams when producing products to enhance production process and performance.** 1. Coordinate work teams when producing products to enhance production process and performance. 2. Develop team goals to enhance performance. 3. Make job assignments to avail the use of the best personnel in key assignments. 4. Coordinate work flow with team members and other work groups. 5. Communicate material specifications, production requirements, product specifications, and delivery issues in a timely and accurate manner.	D.5. Specifications and requirements	Statistics: Charts and tables (3)	6.EE.2; 6.EE.3; 6.SP.4; 6.SP.5; 7.SP.2; 7.SP.3; 7.SP.4; 8.SP.3; 8.SP.4	S.IC.1; S.IC.2; S.IC.3; S.IC.4; S.IC.5; S.IC.6; S.ID.1

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	Manufacturing **A. Evaluate the nature and scope of the Manufacturing Career Cluster™ and the role of manufacturing in society and in the economy.** 1. Identify the role and major functions of manufacturing businesses. 2. Describe how manufacturing businesses manage performance. 3. Describe how changes outside the manufacturing business impact the manufacturing business. 4. Explain the role of risk management in reducing risks and improving performance in manufacturing businesses. 5. Identify the roles and functions of government in regulating and supporting manufacturing businesses. **B. Analyze and summarize how manufacturing businesses improve performance.** 1. Describe how manufacturing businesses manage customer relationships. 2. Describe how planning and budgeting are used to accomplish organizational goals and objectives. 3. Explain how planning is used to improve overall business performance. **D. Describe career opportunities and means to achieve those opportunities in each of the Manufacturing Career Pathways.** 1. Locate career opportunities in manufacturing that appeal to personal career goals. 2. Match personal interests and aptitudes to manufacturing careers.	A. 2. Introduction to manufacturing business finances B. 2. Cost analysis	Whole numbers: Add, subtract, multiply (2) Decimals: Add, subtract, multiply (2) Percents: Compute (2) Whole numbers: Add, subtract, multiply (2) Decimals: Add, subtract, multiply (2) Percents: Compute (2)	7.EE.3; 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3; 6.RP.2; 6.RP.3; 7.EE.2 7.EE.3; 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3; 6.RP.2; 6.RP.3; 7.EE.2	A.APR.1; A.APR.7; N.RN.3; N.Q.1 A.APR.1; A.APR.7; N.RN.3; N.Q.1

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	3. Identify pathways with common knowledge and skills that provide a worker with the potential for mobility.				
	E. Describe government policies and industry standards that apply to manufacturing. 1. Identify the major federal and state regulatory areas. 2. Explain how government agencies ensure compliance with environmental regulations and promote improved performance. 3. Demonstrate workplace activities that comply with safety, health, and environmental policies and procedures. 4. Demonstrate knowledge of rules and laws designed to promote safety and health and their rationale.				
	Career Ready Practices **A. Career Ready Skills** 1. Act as a responsible and contributing citizen and employee. 2. Apply appropriate academic and technical skills. 3. Attend to personal health and financial well-being. 4. Communicate clearly, effectively and with reason. 5. Consider the environmental, social and economic impacts of decisions. 6. Demonstrate creativity and innovation. 7. Employ valid and reliable research strategies. 8. Model integrity, ethical leadership and effective management. 9. Plan education and career path aligned to	A. 2. Apply appropriate academic skills A. 3. Financial well-being A. 4. Communicate effectively with exact measurements	All standards otherwise identified Whole numbers: Add, subtract, multiply (2) Decimals: Add, subtract, multiply (2) Percents: Compute (2) Whole numbers: Add, subtract, multiply (1) Decimals: Add, subtract, multiply (1) Percents: Compute (1) Ratio and proportion:	7.EE.3; 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3; 6.RP.2; 6.RP.3; 7.EE.2 7.EE.3; 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3; 7.EE.2; 6.RP.1; 6.RP.2; 6.RP.3; 7.RP.1;	A.APR.1; A.APR.7; N.RN.3; N.Q.1 A.APR.1; A.APR.7; N.RN.3; N.Q.1; G.MG.3; A.CED.4

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	personal goals. 10. Use technology to enhance productivity. 12. Work productively in teams while using cultural/global competence.		Proportion, Direct variation (1) Algebra: Substituting data into formulas (1)	7.RP.2; 7.RP.3; 6.EE.2	
2	**Safety & Health for Welders**				
	American Welding Society **B. Module 2: Safety and Health of Welders** 1. Demonstrate proper use and inspection of equipment used for protection of personnel. 2. Demonstrate proper work area operation. 3. Demonstrate proper use and inspection of equipment used for ventilation. 4. Demonstrate proper Hot Zone operation. 5. Demonstrate proper working in confined spaces (at a low level) (Understand what is a confined space). 6. Understand precautionary labeling. 7. Demonstrate proper use and inspection of equipment used for each required welding or thermal cutting process.	B. 1. Proper shielding lens selection B.2. Proper work area operation B. 4. Measurement	Statistics: Charts and tables (1) Customary Measure: Linear (1) Customary Measure: Linear (1)	6.EE.2; 6.EE.3; 6.SP.4; 6.SP.5; 7.SP.2; 7.SP.3; 7.SP.4; 8.SP.3; 8.SP.4 6.NS.2; 6.NS.3; 7.NS.1; 7.EE.3 6.NS.2; 6.NS.3; 7.NS.1; 7.EE.3	S.IC.1; S.IC.2; S.IC.3; S.IC.4; S.IC.5; S.IC.6; S.ID.1 A.APR.1; A.APR.7; N.RN.3; N.Q.1 A.APR.1; A.APR.7; N.RN.3; N.Q.1

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	Production **B. Manage safe and healthy production working conditions and environmental risks.** 1. Perform environmental and safety inspections following local, federal, and company regulations. 2. Perform emergency drills as part of an emergency response team. 3. Identify unsafe conditions according to safety standards. 4. Implement corrective actions to follow safety protocols. 5. Monitor daily housekeeping activities.	B.1 Follow regulations B.3. Safety standards	Customary Measure: Linear (1) Customary Measure: Linear (1)	6.NS.2; 6.NS.3; 7.NS.1; 7.EE.3 6.NS.2; 6.NS.3; 7.NS.1; 7.EE.3	A.APR.1; A.APR.7; N.RN.3; N.Q.1 A.APR.1; A.APR.7; N.RN.3; N.Q.1
	E. Demonstrate the safe use of manufacturing equipment. 1. Train others to use equipment following safe production practices. 2. Recommend processes and procedures to support safety and effectiveness in the work environment. 3. Maintain, install, and repair equipment following required safety and health requirements. 4. Monitor equipment and operator according to workplace safety and compliance with both company and national regulations. 5. Perform preventive maintenance and routine repair by contacting appropriate people and securing needed supplies.	E. 2. Recommend most effective process	Whole numbers: Add, subtract, multiply (1) Decimals: Add, subtract, multiply (1)	7.EE.3; 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3	A.APR.1; A.APR.7; N.RN.3; N.Q.1
	Manufacturing **C. Comply with federal, state and local regulations to ensure worker safety and health and environmental work practices.**				

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	1. Assess workplace conditions according to specified safety and health requirements. 2. Following appropriate safety procedures, demonstrate methods to correct common hazards. 3. Demonstrate safe workplace practices that promote personal and group health.				
3	**Shielded Metal Arc Welding**				
	American Welding Society **D. Module 4: Shielded Metal Arc Welding (SMAW) Principles and Practices** 1. Perform safety inspections of equipment and accessories. 2. Make minor external repairs to equipment and accessories. 3. Set up for shielded metal arc welding operations on plain carbon steel. 4. Operate shielded metal arc welding equipment. 5. Make fillet welds, all positions, on plain carbon steel. 6. Make groove welds, all positions, on plain carbon steel. 7. Perform 2G and 3G, uphill, limited thickness qualification tests on plain carbon steel plate.	D.3. Set up arc welding equipment D.5. Fillet weld gauge D.6. Groove welds	Whole numbers: Add, subtract, multiply (1) Decimals: Add, subtract, multiply (1) Percents: Compute (1) Ratio and proportion: Proportion, direct variation (1) Statistics: charts and tables (1) Geometry: Angles (1) Geometry: Angles (1)	7.EE.3; 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3; 6.RP.2; 6.RP.3; 7.EE.2; 6.RP.1; 6.RP.2; 6.RP.3; 7.RP.1; 7.RP.2; 7.RP.3; 6.EE.2; 6.EE.3; 6.SP.4; 6.SP.5; 7.SP.2; 7.SP.3; 7.SP.4; 8.SP.3; 8.SP.4 7.G.5 7.G.5	A.APR.1; A.APR.7; N.RN.3; N.Q.1; G.MG.3; S.IC.1; S.IC.2; S.IC.3; S.IC.4; S.IC.5; S.IC.6; S.ID.1 G.CO.9; G.CO.12; G.CO.13 G.CO.9; G.CO.12; G.CO.13
4	**Manual OxyFuel Gas Cutting**				
	American Welding Society **H. Module 8: Thermal Cutting Principles and Practices** 1. Perform safety inspections of equipment and accessories.				

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	2. Make minor external repairs to equipment and accessories. 3. Set up for manual oxyfuel gas cutting operations on plain carbon steel. 4. Operate manual oxyfuel gas cutting equipment. 5. Perform straight cutting operations on plain carbon steel. 6. Perform shape cutting operations on plain carbon steel. 7. Perform bevel cutting operations on plain carbon steel. 8. Remove weld metal form plain carbon steel using weld washing techniques. 9. Identify various alternative fuels used in welding and cutting.	H.3. Set up for manual oxyfuel gas cutting H.6. Shape cutting H.7. Bevel cutting	Statistics: charts and tables (1) Geometry: Angle (1) Polygons and Circles (1) Trigonometry: Using trig ratios to find angles and sides. (3) Geometry: Angle (1) Polygons and Circles (1)	6.EE.2; 6.EE.3; 6.SP.4; 6.SP.5; 7.SP.2; 7.SP.3; 7.SP.4; 8.SP.3; 8.SP.4 7.G.5; 6.G.3; 7.G.1; 7.G.6; 6.G.1; 7.G.4; 8.F.3 7.G.5; 6.G.3; 7.G.1; 7.G.6; 6.G.1; 7.G.4; 8.F.3	S.IC.1; S.IC.2; S.IC.3; S.IC.4; S.IC.5; S.IC.6; S.ID.1 G.CO.9; G.CO.12; G.CO.13; G.GPE.7; G.C0.5; G.GMD.1 G.SRT.6; G.SRT.8; F.TF.1; F.TF.2; F.TF.3; F.TF.4; F.TF.5; F.TF.7; G.GS.5; G.SRT.5 G.CO.9; G.CO.12; G.CO.13; G.GPE.7; G.C0.5; G.GMD.1
5	**Flux Cored Arc Welding**				
	American Welding Society **F. Module 6: Flux Cored Arc Welding (FCAW-G/GM) Principles and Practices** 1. Perform safety inspections of equipment and accessories. 2. Make minor external repairs to equipment and accessories. 3. Set up for flux cored arc welding operations on plain carbon steel. 4. Operate flux cored arc welding equipment. 5. Make fillet welds, all positions, on plain	F.3. Set up for flux cored arc welding F.5. Make fillet	Whole numbers: Add, subtract, multiply (1) Decimals: Add, subtract, multiply (1) Percents: Compute (1) Ratio and proportion: Proportion, direct variation (1) Statistics: charts and tables (1)	7.EE.3; 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3; 7.EE.2; 6.RP.1; 6.RP.2; 6.RP.3; 7.RP.1; 7.RP.2; 7.RP.3; 6.EE.2; 6.EE.3; 6.SP.4; 6.SP.5; 7.SP.2; 7.SP.3;	A.APR.1; A.APR.7; N.RN.3; N.Q.1; G.MG.3; S.IC.1; S.IC.2; S.IC.3; S.IC.4; S.IC.5; S.IC.6; S.ID.1; G.CO.9; G.CO.12; G.CO.13

Segment	CTE Segments/Performance Elements	CTE Concepts	Math Concepts	Common Core Math Standards Middle School	Common Core Math Standards High School
	carbon steel. 6. Make groove welds, all positions, on plain carbon steel.	welds F.6. Make groove welds	Geometry: Angles (1) Geometry: Angles (1)	7.SP.4; 8.SP.3; 8.SP.4; 7.G.5	
6	**Drawing and Welding Symbols**				
	American Welding Society **C. Module 3: Drawing and Welding Symbol Interpretation** 1. Interpret basic elements of a drawing or sketch. 2. Interpret welding symbol information. 3. Fabricate parts to blueprint specification (i.e.: layout, cut and fit along with joint preparation).	C.3. Fabricate parts to specifications	Ratio and Proportion: Ratio, proportion (1),scale (1) Whole Numbers: Add, Subtract, Multiply, Divide (1) Fractions: Add, Subtract, Multiply, Divide (1) Decimals: Add, Subtract, Multiply, Divide (1) Customary Measure: Linear(1) Metric Measure: Length,Metric/English conversion (1) Geometry: Angles (1) Circles and Polygons-general math (2)	7.EE.3; 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3; 6.RP.1; 6.RP.2; 6.RP.3; 7.RP.1; 7.RP.2; 7.RP.3; 6.EE.2; 7.G.5; 6.G.3; 7.G.1; 7.G.6; 6.G.1; 7.G.4; 8.F.3	A.APR.1; A.APR.7; N.RN.3; N.Q.1; G.MG.3; G.CO.9; G.CO.12; G.CO.13; G.GPE.7; G.C0.5; G.GMD.1

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	Manufacturing **F. Demonstrate workplace knowledge and skills common to manufacturing.** 1. Demonstrate the planning and layout processes (e.g., designing, print reading, measuring) used in manufacturing. 2. Summarize how materials can be processed using tools and machines. 3. Describe various types of assembling processes (e.g., mechanical fastening, mechanical force, joining, fusion bonding, adhesive bonding) used in manufacturing. 4. Explain finishing processes (e.g., types of finishing materials, surface preparation, methods of application) used in manufacturing.	F.1. Print reading, measuring	Ratio and Proportion: Ratio, proportion (1),scale (1) Whole Numbers: Add, Subtract, Multiply, Divide (1) Fractions: Add, Subtract, Multiply, Divide (1) Decimals: Add, Subtract, Multiply, Divide (1) Customary Measure: Linear(1) Metric Measure: Length,Metric/English conversion (1) Geometry: Angles (1) Circles and Polygons-general math (2)	7.EE.3; 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3; 6.RP.1; 6.RP.2; 6.RP.3; 7.RP.1; 7.RP.2; 7.RP.3; 6.NS.1; 6.EE.2; 7.G.5; 6.G.3; 7.G.1; 7.G.6; 6.G.1; 7.G.4; 8.F.3	A.APR.1; A.APR.7; N.RN.3; N.Q.1; G.MG.3
	Career Ready Practices **A. Career Ready Skills** 11. Utilize critical thinking to make sense of problems and persevere in solving them.	A.11. Critical thinking and making sense of problems	Problem Solving (1)		
7	**Gas Metal Arc Welding**				
	American Welding Society **E. Module 5: Gas Metal Arc Welding (GMAW, GMAW-S,GMAW-P) Principles and Practices** 1. Perform safety inspections of equipment and accessories.	E.3. Set up for gas metal arc welding	Whole numbers: Add, subtract, multiply (1) Decimals: Add, subtract, multiply (1) Percents: Compute (1)	7.EE.3; 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3; 6.EE.2; 6.EE.3; 6.SP.4;	A.APR.1; A.APR.7; N.RN.3; N.Q.1; G.MG.3; S.IC.1; S.IC.2; S.IC.3; S.IC.4; S.IC.5; S.IC.6; S.ID.

Segment	CTE Segments/Performance Elements	CTE Concepts	Math Concepts	Common Core Math Standards Middle School	Common Core Math Standards High School
	2. Make minor external repairs to equipment and accessories. 3. Set up for gas metal arc welding operations on plain carbon steel. 4. Operate gas metal arc welding equipment. 5. Short circuit transfer. 6. Make fillet welds, all positions, on plain carbon steel. 7. Make groove welds, all positions, on plain carbon steel. 8. Spray transfer. 9. Make 1F and 2F welds on plain carbon steel. 10. Make 1G welds on plain carbon steel. 11. Describe gas metal arc welding-pulse theory.	E.5. Short Circuit Transfer E.6. Make fillet welds E.7. Make groove welds E.8. Spray Transfer	Ratio and proportion: Proportion, direct variation (1),rates (1) Statistics: charts and tables (1) Whole numbers: Add, subtract, multiply (1) Decimals: Add, subtract, multiply (1) Percents: Compute (1) Ratio and proportion: Proportion, direct variation (1),rates (1) Statistics: charts and tables (1) Geometry: Angles (1) Geometry: Angles (1) Whole numbers: Add, subtract, multiply (1) Decimals: Add, subtract, multiply (1) Percents: Compute (1) Ratio and proportion: Proportion, direct variation (1),rates (1) Statistics: charts and tables (1)	6.SP.5; 7.SP.2; 7.SP.3; 7.SP.4; 8.SP.3; 8.SP.4 7.EE.3; 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3; 6.EE.2; 6.EE.3; 6.SP.4; 6.SP.5; 7.SP.2; 7.SP.3; 7.SP.4; 8.SP.3; 8.SP.4 7.G.5 7.EE.3; 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3; 6.EE.2; 6.EE.3; 6.SP.4; 6.SP.5; 7.SP.2; 7.SP.3; 7.SP.4; 8.SP.3; 8.SP.4	A.APR.1; A.APR.7; N.RN.3; N.Q.1; G.MG.3; S.IC.1; S.IC.2; S.IC.3; S.IC.4; S.IC.5; S.IC.6; S.ID.1 G.CO.9; G.CO.12; G.CO.1 A.APR.1; A.APR.7; N.RN.3; N.Q.1; G.MG.3; S.IC.1; S.IC.2; S.IC.3; S.IC.4; S.IC.5; S.IC.6; S.ID.1

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8	**Mechanized OxyFuel Gas Cutting**				
	American Welding Society **A. Module 1: Occupational Orientation** 5. Receive exposure to welding and/or cutting automation theory. **H. Module 8: Thermal Cutting Principles and Practices** 10. Perform safety inspections of equipment and accessories. 11. Make minor external repairs to equipment and accessories. 12. Set up for machine oxyfuel gas cutting (track burner) operations on plain carbon steel. 13. Operate machine oxyfuel gas cutting (track burner) equipment. 14. Perform straight cutting operations on plain carbon steel. 15. Perform bevel cutting operations on plain carbon steel.	A.12. Set up for machine oxyfuel gas cutting H.15. Perform bevel cutting operations	Geometry: Angles (1) Ratio and Proportions: Rates (1) Statistics: Charts and tables (1) Geometry: Angles (1)	6.RP.1; 6.RP.2; 6.RP.3; 7.RP.1; 7.RP.2; 7.RP.3; 7.EE.3; 7.G.5; 6.EE.2; 6.EE.3; 6.SP.4; 6.SP.5; 7.SP.2; 7.SP.3; 7.SP.4; 8.SP.3; 8.SP.4 7.G.5	G.MG.3; G.CO.9; G.CO.12; G.CO.13; S.IC.1; S.IC.2; S.IC.3; S.IC.4; S.IC.5; S.IC.6; S.ID.1 G.CO.9; G.CO.12; G.CO.13
9	**Gas Tungsten Arc Welding**				
	American Welding Society **G. Module 7: Gas Tungsten Welding (GTAW) Principles and Practices** 1. Perform safety inspections of equipment and accessories. 2. Make minor external repairs to equipment and accessories. 3. Set up for gas tungsten arc welding operations on plain carbon steel, aluminum, and stainless steel. 4. Operate gas tungsten arc welding equipment.	G.3. Set up for gas tungsten arc welding	Whole numbers: Add, subtract, multiply (1) Decimals: Add, subtract, multiply (1) Percents: Compute (1) Ratio and proportion: Proportion, direct variation (1) Statistics: charts and tables (1)	7.EE.3; 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3; 6.RP.2; 6.RP.3; 7.EE.2; 6.RP.1; 6.RP.2; 6.RP.3; 7.RP.1; 7.RP.2; 7.RP.3; 6.EE.2; 6.EE.3; 6.SP.4; 6.SP.5; 7.SP.2; 7.SP.3;	A.APR.1; A.APR.7; N.RN.3; N.Q.1; G.MG.3; S.IC.1; S.IC.2; S.IC.3; S.IC.4; S.IC.5; S.IC.6; S.ID.1

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	5. Make fillet welds, all positions, on plain carbon steel. 6. Make groove welds, all positions, on carbon steel. 7. Make 1F and 2F welds on aluminum. 8. Make 1G welds on aluminum. 9. Make 1F, 2F, and 3F welds on stainless steel. 10. Identify various tungsten and their uses/applications.	G.5. Fillet welds G.6. Groove welds G.10. Identify tungsten and uses	Geometry: Angles (1) Geometry: Angles (1) Statistics: Charts and tables (1)	7.SP.4; 8.SP.3; 8.SP.4 7.G. 7.G.5 6.EE.2; 6.EE.3; 6.SP.4; 6.SP.5; 7.SP.2; 7.SP.3; 7.SP.4; 8.SP.3; 8.SP.4	G.CO.9; G.CO.12; G.CO.13 G.CO.9; G.CO.12; G.CO.13 S.IC.1; S.IC.2; S.IC.3; S.IC.4; S.IC.5; S.IC.6; S.ID.1
10	**Plasma Arc Cutting**				
	American Welding Society **H. Module 8: Thermal Cutting Principles and Practices** 16. Perform safety inspections of equipment and accessories. 17. Make minor external repairs to equipment and accessories. 18. Set up for manual plasma arc cutting operations on plain carbon steel, aluminum, and stainless steel. 19. Operate manual plasma arc cutting equipment. 20. Perform shape cutting operations on plain	**H.18. Set up plasma cutter** **H.20. Shape cutting**	Statistics: Charts and tables (1) Geometry: Angle (1) Polygons and Circles	6.EE.2; 6.EE.3; 6.SP.4; 6.SP.5; 7.SP.2; 7.SP.3; 7.SP.4; 8.SP.3; 8.SP.4 7.G.5	S.IC.1; S.IC.2; S.IC.3; S.IC.4; S.IC.5; S.IC.6; S.ID.1 G.CO.9; G.CO.12;

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	carbon steel, aluminum, and stainless steel (gouging).		(1) Trigonometry: Using trig ratios to find angles and sides. (3)	7.G.5; 6.G.3; 7.G.1; 7.G.6; 6.G.1; 7.G.4; 8.F.3	G.CO.13; G.GPE.7; G.C0.5; G.GMD.1; G.SRT.6; G.SRT.8; F.TF.1; F.TF.2; F.TF.3; F.TF.4; F.TF.5; F.TF.7; G.GS.5; G.SRT.5
11	**Weld Inspection and Testing**				
	American Welding Society **I. Module 9: Welding Inspection and Testing Principles and Practices** 1. Examine cut surfaces and edges of prepared base metal parts. 2. Examine tack, intermediate layers, and completed welds.	I.2. Measuring undercut or overfill (convexity, concavity)	Customary Measure: linear (1) Whole Numbers: Add and Subtract (1) Fractions: Add and Subtract (1)	6.NS.2; 6.NS.3; 7.EE.3; 6.EE.2; 7.NS.1; 7.NS.2; 7.NS.3; 6.NS.1	A.APR.1; A.APR.7; N.RN.3; N.Q.1
	Production **A. Diagnose production process problems and take corrective action to meet production quality standards.** 1. Communicate quality problems following the appropriate reporting process. 2. Suggest or perform corrective actions to correct quality problems. 3. Determine appropriate action for sub-standard product. 4. Identify trends using records of process outcomes. 5. Implement closed-loop corrective action to provide for ongoing production feedback. 6. Research energy consumption reduction in				

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	manufacturing. **C. Make continuous improvement recommendations based on results of production process audits and inspections.** 1. Perform periodic internal quality audits using company audit procedures. 2. Check calibration of gauges and other data collection equipment. 3. Recommend process improvements based upon audits and inspections. 4. Inspect materials at all stages of process to determine quality or condition. 5. Document the results of quality testing using reliable data. 6. Adjust processes to restore or maintain quality, based on data from audit or inspection reports.	C.2. Calibration C.4. Inspect	Whole Numbers: Add, Subtract (2) Decimals: Add, Subtract(2) Fractions: Add, Subtract, Convert fractions/decimals (2) Whole Numbers: Add, Subtract (2) Decimals: Add, Subtract(2) Fractions: Add, Subtract, Convert fractions/decimals (2)	7.EE.3; 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3; 6.NS.1; 6.EE.2; 7.EE.3; 6.NS.2; 6.NS.3; 6.NS.5; 7.NS.1; 7.NS.2; 7.NS.3; 6.NS.1; 6.EE.2;	A.APR.1; A.APR.7; N.RN.3; N.Q.1 A.APR.1; A.APR.7; N.RN.3; N.Q.1
	Manufacturing **D. Describe career opportunities and means to achieve those opportunities in each of the Manufacturing Career Pathways.** 4. Maintain personal certification and licensure requirements. **F. Demonstrate workplace knowledge and skills common to manufacturing.**				

Segment	CTE Segments/Performance Elements	CTE Concepts	Math Concepts	Common Core Math Standards Middle School	Common Core Math Standards High School
	5. Explain the processes of inspection and quality control used in manufacturing.				
12	**Carbon Arc Cutting**				
	American Welding Society **H. Module 8: Thermal Cutting Principles and Practices** 21. Perform safety inspections of equipment and accessories. 22. Make minor external repairs to equipment accessories. 23. Set up for manual air carbon arc gouging and cutting operations on plain carbon steel. 24. Operate manual air carbon arc cutting equipment. 25. Perform metal removal operations on plain carbon steel.	H.23. Set up manual air carbon arc gouging, grooving and cutting operations	Statistics: Charts and tables (1)	6.EE.2; 6.EE.3; 6.SP.4; 6.SP.5; 7.SP.2; 7.SP.3; 7.SP.4; 8.SP.3; 8.SP.4	S.IC.1; S.IC.2; S.IC.3; S.IC.4; S.IC.5; S.IC.6; S.ID.1