

Identifier	Poplar - Master - Metal Working		Introduced	Completed
M MW 1	<b>SAFETY AND EQUIPMENT</b>			
M MW 1.1.01	General Rules	Customize or develop a lab safety program.		
M MW 1.1.02	General Rules	Obtains certification in First Aid/CPR.		
M MW 1.1.03	General Rules	Provide a lab safety demonstration to students.		
M MW 1.2.01	Fire Rules	Create a fire safety program.		
M MW 2	<b>MEASUREMENT AND LAYOUT</b>			
M MW 2.1.01	Measuring	Demonstrate use of metric measuring devices to one millimeter.		
M MW 2.1.02	Measuring	Demonstrate appropriate measuring techniques to peers.		
M MW 2.2.01	Layout	Layout complex shapes and angles other than 45° and 90°.		
M MW 2.3.01	Drawings	Draw orthographic projections with an isometric or oblique view.		
M MW 2.3.02	Drawings	Identify twenty blueprint acronyms and symbols.		
M MW 2.4.01	Mathematics	Apply math solutions in the metalworking lab using geometry.		
M MW 3	<b>METALLURGY</b>			
M MW 3.1.01	Types	Demonstrate magnet and file test.		
M MW 3.1.02	Types	Identify characteristics of metal alloys.		
M MW 3.2.01	Hardening/ Annealing	Demonstrate the tempering process.		
M MW 3.3.01	Heating/ Cooling	Demonstrate how metal is deformed during heating and cooling.		
M MW 4	<b>TOOLS AND MACHINES</b>			
M MW 4.1.01	Stationary	Perform non-electrical preventative maintenance on machinery to comply with safety requirements.		
M MW 4.2.01	Portable	Perform non-electrical preventative maintenance on portable power machines to comply with safety requirements.		
M MW 4.3.01	Hand Tools	Perform non-electrical preventative maintenance on chisels and punches to comply with safety requirements.		
M MW 5	<b>WELDING TECHNIQUES</b>			
M MW 5.1.01	Safety	Clean and maintain personal protective safety gear.		
M MW 5.1.02	Safety	Develop a personal safety checklist.		
M MW 5.2.01	Oxy-Fuel	Demonstrate the safe handling and storage of compressed gas cylinders under the direct supervision of the instructor.		
M MW 5.2.02	Oxy-Fuel	Demonstrate piercing, slotting, and bevel cutting techniques.		
M MW 5.2.03	Oxy-Fuel	Complete a NIOSH safety check list.		
M MW 5.3.01	Shielded Metal Arc	Demonstrate appropriate SMAW techniques to peers.		
M MW 5.3.02	Shielded Metal Arc	Identify SMAW problems, their causes, and take corrective action.		
M MW 5.4.01	Gas Metal Arc	Demonstrate appropriate GMAW techniques to peers.		
M MW 5.4.02	Gas Metal Arc	Identify GMAW problems, their causes, and take corrective action.		
M MW 5.5.01	Gas Tungsten Arc	Demonstrate appropriate GTAW techniques to peers.		
M MW 5.5.02	Gas Tungsten Arc	Identify GTAW problems, their causes, and take corrective action.		
M MW 5.5.03	Gas Tungsten Arc	Demonstrate ability to weld aluminum.		
M MW 5.6.01	Plasma Arc	Demonstrate appropriate plasma arc cutting techniques to peers.		
M MW 5.6.02	Plasma Arc	Identify plasma arc cutting problems, their causes, and take corrective action.		
M MW 6	<b>SHEET METAL</b>			
M MW 6.1.01	Patterns	Demonstrate the use of radial line, parallel line, and triangulation development.		
M MW 6.1.02	Patterns	Demonstrate how to find true length lines.		
M MW 6.2.01	Forming	Demonstrate the ability to make a Pittsburg seam by hand.		
M MW 6.2.02	Forming	Perform basic preventative non-electrical maintenance on machines and tools to comply with safety requirements for optimal performance levels.		
M MW 6.3.01	Fastening	Join metal together using a Pittsburg seam.		
M MW 6.3.02	Fastening	Join metal together using low temperature solder.		
M MW 7	<b>MACHINE TOOLS</b>			
M MW 7.1.01	Cutting Lathe	Demonstrate the ability to turn a taper using one of the three taper cutting techniques.		
M MW 7.1.02	Cutting Lathe	Demonstrate the ability to cut threads.		
M MW 7.1.03	Cutting Lathe	Demonstrate the ability to center a tailstock.		
M MW 7.1.04	Cutting Lathe	Demonstrate the ability to indicate a work piece in a four-jaw chuck.		
M MW 7.1.05	Cutting Lathe	Demonstrate the ability to use a boring bar.		
M MW 7.2.01	Milling	Locate an edge with edge finder.		
M MW 7.2.02	Milling	Mill an external radius with a rotary table.		
M MW 7.2.03	Milling	Mill a work piece using simple indexing operation.		
M MW 7.3.01	Drill Press	Demonstrate the ability to large hole drill.		
M MW 7.3.02	Drill Press	Demonstrate the ability to drill to depth.		
M MW 8	<b>EMPLOYABILITY SKILLS</b>			
M MW 8.1.01	Problem Solving	Develop methods to analyze the advantages and disadvantages of alternative solutions.		
M MW 8.1.02	Problem Solving	Devise an action plan for a metalworking problem based on information gained through research of alternative solutions and implement in a group decision/action.		
M MW 8.2.01	Critical Thinking	Analyze how critical-thinking skills affect work performance.		
M MW 8.2.02	Critical Thinking	Formulate, implement, and evaluate an action plan.		
M MW 8.2.03	Critical Thinking	Demonstrate the skills necessary to identify, analyze, and solve a design problem.		
M MW 8.3.01	Speak, Write, Listen	Identify, research, prepare and deliver a metalworking related presentation.		

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M MW 8.3.02	Speak, Write, Listen	Prepare technical documents relating to bill of materials, blueprints, etc.		
M MW 8.3.03	Speak, Write, Listen	Present and defend a metalworking procedure.		
M MW 8.3.04	Speak, Write, Listen	Compete in a SkillsUSA job skill demonstration and/or public speaking contest.		
M MW 8.4.01	Technology	Critique the use, benefits and cost of technologically advanced equipment in the metalworking trade.		
M MW 8.4.02	Technology	Analyze the impact of technological changes on one or more aspects of metalworking trades by researching current literature.		
M MW 8.4.03	Technology	Compete in a state-level SkillsUSA metalworking contest.		
M MW 8.5.01	Leadership and Teamwork	Analyze the stages of group development.		
M MW 8.5.02	Leadership and Teamwork	Demonstrate leadership ability within a group or team.		
M MW 8.5.03	Leadership and Teamwork	Compromise and/or build consensus within a group and summarize the decision of the group while maintaining respect for diverse viewpoints.		
M MW 8.5.04	Leadership and Teamwork	Complete levels 1-3 of the SkillsUSA Professional Development Program.		
M MW 8.5.05	Leadership and Teamwork	Campaign for a local SkillsUSA chapter office.		
M MW 8.5.06	Leadership and Teamwork	Serve as a committee chair in a local SkillsUSA chapter.		
M MW 8.6.01	Ethics	Demonstrate time-management skills and cost-effective practices.		
M MW 8.7.01	Workplace	Recognize the individual roles of team members, delegate tasks, and provide feedback on performance.		
M MW 8.7.02	Workplace	Acknowledge and utilize the skills, abilities, and input of all members of a team.		
M MW 8.7.03	Workplace	Develop an action plan to accomplish tasks within a given time frame.		
M MW 8.8.01	Career	Develop a community service or job shadowing project.		
M MW 8.8.02	Career	Develop an education/training plan to fulfill long-term career goals.		
M MW 8.8.03	Career	Define advantages and disadvantages of self-employment or working for various sizes and types of businesses.		
M MW 8.8.04	Career	Critique results of a job interview.		
M MW 8.8.05	Career	Develop a proposal for an organized community service project.		
M MW 8.8.06	Career	Compete in a state level SkillsUSA job interview contest.		
M MW 8.9.01	Retention	Maintain an electronic portfolio.		
M MW 8.9.02	Retention	Create a plan for lifelong learning.		
M MW 8.9.03	Retention	Create a presentation illustrating interpersonal skills needed for job retention.		
M MW 8.9.04	Retention	Adapt new knowledge and skills in changing situations.		
M MW 8.9.05	Retention	Analyze how work life is affected by families and how families are affected by work life.		