State of Oklahoma Welding Duty/Task Crosswalk

The following state of Oklahoma welding tasks, which are aligned to AWS standards, are covered in this publication. The first column identifies Oklahoma's task by name and number. The second column identifies the exact location by unit number and objective, assignment sheet, or job sheet in this MAVCC publication unless otherwise noted. Oklahoma Welding Tasks present Oxyfuel Cutting as part of the "Combination Welder" occupation. Duty G under this heading prsents Oxyfuel tasks that appears in this MAVCC text.

Occupation: Combination Welder	**MAVCC Tasks**
Duty A: Demonstrate Employability Skills	
A.18 Identify employment opportunities	*Fundamentals of Welding*, Unit 1, Objective 7—Job outlook for welders; Objective 9—Career opportunities for welders; Assignment Sheet 2—Compare employment opportunities in welding
A.19 Identify levels of training recommended for related careers	*Fundamentals of Welding*, Unit 1, Objective 8—What it takes to become a good welder
A.20 Understand salary, wages and benefits packages	*Fundamentals of Welding*, Unit 1, Objective 6—What welders earn
Safety	
A.26 Explain the purpose for safety policies	*Fundamentals of Welding*, Unit 2, Objective 4—Hazard communication; Assignment Sheet 1—Complete the student safety pledge form; Assignment Sheet 5—Identify and correct safety violations
A.27 Discuss the role of OSHA and EPA — Locate information in MSDS	*Fundamentals of Welding*, Unit 2, Objective 6—Purposes of material safety data sheets; Student Supplement 1—Guidelines for interpreting material safety data sheets; Assignment Sheet 2—Interpret a material safety data sheet
A.28 Participate in OSHA training, if possible — Lock Out/Tag Out	*Fundamentals of Welding*, Unit 2, Objective 8—Safety tags and their color coding; Objective 19—Instances when lockout devices should be used
— HAZCOM	*Fundamentals of Welding*, Unit 2, Objective 4—Hazard communication
— MSDS	*Fundamentals of Welding*, Unit 2, Objective 6—Purposes of MSDS; Student Supplement 1—Guidelines for interpreting MSDS; Assignment Sheet 2—Interpret a material safety data sheet

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Occupation: Combination Welder	MAVCC Tasks
— Bloodborne Pathogens	*Fundamentals of Welding*, Unit 3, Objective 18—Basic first-aid procedures for various emergency situations
A.29 Explain the proper steps in reporting an accident or emergency	*Fundamentals of Welding*, Unit 3, Objective 16—General steps for handling any emergency situation; Objective 17—General guidelines for first aid emergencies; Assignment Sheet 1—Determine basic first aid measures for given emergency situations
A.30 Explain the hazards associated with specific types of equipment and tools	*Fundamentals of Welding*, Unit 2, Objective 3—General job and shop safety rules; Assignment Sheet 5—Identify and correct safety violations *GMAW/FCAW*, Unit 1, Objective 10—Rules for handling hollow casting or containers; Objective 11—Hazards associated with arc rays
A.31 Perform machine operator safety checks of equipment and accessories, when necessary	*Fundamentals of Welding*, Unit 2, Assignment Sheet 5—Identify and correct safety violations; Unit 4, Objective 21—Basic rules for safe use of power tools and equipment
A.32 Practice tool safety	*Fundamentals of Welding*, Unit 2, Objective 3d—Tool use, maintenance, and storage safety; Unit 3, Objective 9—Rules for handling welding cables and gas and coolant hoses; Unit 4, Objective 20—Rules for hand tool safety; Objective 21—Basic rules for safe use of power tools and equipment; Objective 22—Rules for tool and equipment maintenance
A.33 Describe the types of fire hazards found in the workplace	*Fundamentals of Welding*, Unit 2, Objective 10—Components of fire triangle; Objective 11—Types of fires and classifications; Objective 12—Types of fire extinguishers; Objective 13—Fire extinguisher markings and class of fire they represent; Objective 14—Fire extinguisher operating instructions that follow P-A-S-S; Student Supplement 2—Using Portable Fire Extinguishers; Assignment Sheet 4—Determine correct fire extinguishers to use for various situations; Job Sheet 1—Operate a fire extinguisher

Occupation: Combination Welder	MAVCC Tasks
A.34 Discuss electrical hazards	*Fundamentals of Welding*, Unit 2, Objective 3f—Electrical safety; Unit 3, Objective 19—Treating a victim of electrical shock *GMAW and FCAW*, Unit 1, Objective 7—Electrical safety requirements for GMAW
A.35 Demonstrate safe use of personal protective equipment	*Fundamentals of Welding*, Unit 2, Objective 20—Fall protection systems; Objective 21—Confined space entry; Objective 22—Environmental contaminants that would require you to use a respirator
A.36 Demonstrate safe material handling techniques — Lifting — Transporting — Storing	*Fundamentals of Welding*, Unit 2, Objective 15—Causes of back injuries; Objective 16—Guidelines for lifting and moving items safely; Job Sheet 2—Lift a heavy object properly
A.37 Understand established first aid procedures	*Fundamentals of Welding*, Unit 3, Objective 16—General steps for handling any emergency situation; Objective 17—General guidelines for first aid emergencies; Objective 18—Basic first-aid procedures for various emergency situations; Student Supplement 2—A systematic look at first aid; Assignment Sheet 1—Determine basic first aid measures for given emergency situations
A.38 Practice good housekeeping	Oxyacetylene Welding and Oxyfuel Cutting—All job sheets require students to clean up their work areas and return tools and equipment to proper storage.
A.39 Comply with company safety policies	*Fundamentals of Welding*, Unit 2, Assignment Sheet 1—Complete the student safety pledge form

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Occupation: Combination Welder	MAVCC Tasks
Basic Academic Skills	
A.40 Apply mathematical operations involving whole numbers, fractions, decimals, percentages; mathematical word problems, ratios, etc., when necessary — Addition — Subtraction — Multiplication — Division	*Fundamentals of Welding*, Unit 6, Assignment Sheet 1—Add, subtract, multiply, and divide fractions; Assignment Sheet 2—Add, subtract, multiply, and divide decimal equivalents; Assignment Sheet 3—Convert fractions to decimal form, change fractions to a common denominator, and reduce fractions to lowest terms; Assignment Sheet 4—Write fractions as decimals and percents; Assignment Sheet 6—Write decimals as fractions and percents; Assignment Sheet 8—Make conversions with an inches-to-decimal conversation chart.
A.41 Apply advanced mathematical operations, when necessary — Algebra — Geometry — Trigonometry — Calculus — Statistical Methods	*Fundamentals of Welding*, Unit 6, Objective 8—Terms used in geometry; Objective 9—Types of geometric figures; Objective 12—Area of geometric figures; Assignment Sheet 14—Calculate area of geometric figures; Job Sheet 1—Adjust a bevel square to a 45° angle using a framing square, a combination square, and a protractor; Job Sheet 2—Form 90° and 45° angles with a combination square and draw parallel lines on metal stock
A.42 Apply scientific principles, when necessary — Physics — Chemistry	*Fundamentals of Welding*, Unit 5, Objective 4—Metal identification tests; Objective 5—Mechanical properties of metals; Objective 6—Types of mechanical strengths, Objective 7—Physical property of metals; Job Sheet 1—Conduct magnet tests to identify common metals used in welding; Job Sheet 2—Conduct chisel test to identify common metals used for welding; Job Sheet 3—Conduct spark tests to identify common metals used for welding
A.43 Interpret charts, table, and graphs	*Fundamentals of Welding*, Unit 6, Assignment Sheet 7—Make conversions decimals with a decimal equivalent chart; Assignment Sheet 8—Make conversations with an inches-to-decimal conversion chart
A.44 Apply reading and writing skills, when necessary	Most assignment sheets require the student to read and write.

Occupation: Combination Welder	MAVCC Tasks
Blueprint Reading	
A.50 Identify basic elements of blueprints — Terms — Components — Symbols	*Fundamentals of Welding*, Unit 7, "Welding Print Reading" *Fundamentals of Welding*, Unit 7, Objective 1—Terms related to print reading; Objective 2—Basic lines; Objective 13—Symbols
A.51 Discuss different types of drawings	*Fundamentals of Welding*, Unit 7, Objective 4—Isometric and oblique drawings
A.52 Interpret drawings — Bill of Materials — Revisions — Tolerances	*Fundamentals of Welding*, Unit 7, Objective 4—Isometric and oblique drawings; Objective 6—Tolerancing; Objective 15—Requirements for a formal bill of material; Objective 16—Requirements for an informal bill of material; Assignment Sheet 5—Interpret tolerance dimensions in decimals, fractions, and degrees; Unit 8, Assignment Sheet 5—Interpret a welding print and welding procedure specifications
A.53 Interpret symbols	*Fundamentals of Welding*, Unit 7, Objective 13—Symbols
Measurement Tools and Techniques	
A.54 Identify types of measuring instruments	*Fundamentals of Welding*, Unit 6, Objective 6—Types of rules and examples of their graduations
A.55 Use appropriate measurement instrument for a measurement task	*Fundamentals of Welding*, Unit 6, Job Sheet 2—Form 90° and 45° angles with a combination square and draw parallel lines on metal stock
A.56 Read measuring instruments	*Fundamentals of Welding*, Unit 6, Objective 7—Steps in reading a rule; Assignment Sheet 9—Measure distances with 1″, 1/2″, and 1/4″ graduations; Assignment Sheet 10—Measure distances with 1/4″ and 1/8″ graduations; Assignment Sheet 12—Measure distances with 1/16″ graduations; Job Sheet 1—Adjust a bevel square to a 45° angle using a framing square, a combination square, and a protractor; Job Sheet 2—Form 90° and 45° angles with a combination square and draw parallel lines on metal stock

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A.57 Identify the appropriate formula and units for a measurement task	*Fundamentals of Welding*, Unit 6, Objective 11—Squares, rectangles, and triangles and their formulas for calculating their perimeters; Objective 12—Area of geometric figures
A.58 Differentiate between English and Metric measurement systems, when necessary	*Fundamentals of Welding*, Unit 6, Objective 13—English-metric conversion charts and how to use them; Assignment Sheet 13—Make conversations with an English-metric conversion chart
A.59 Communicate measurements using proper symbols or words	*Fundamentals of Welding*, Unit 6, Objective 10—Units of measure and their equivalents
Duty B: Interpret Drawing and Welding Symbols and Written Welding Procedures	
B.01 Interpret basic elements of drawing/sketch	*Fundamentals of Welding*, Unit 7—Welding Print Reading (entire unit)
— Structural members	*Fundamentals of Welding*, Unit 7, Objective 14—Structural shapes
— Sequence of assembly	*Fundamentals of Welding*, Unit 7, Assignment Sheet 8—Construct adjacent parts in an assembly section
— Dimensions of tolerances	*Fundamentals of Welding*, Unit 7, Objective 5—Dimensioning; Objective 7—Methods of dimensioning; Assignment Sheet 5—Interpret tolerance dimensions in decimals, fractions, and degrees
— Scale	*Fundamentals of Welding*, Unit 7, Objective 9—Reduction and enlargement scales
— View interpretation	*Fundamentals of Welding*, Unit 7, Objective 3—Basic views; Objective 12—Types of section views; Student Supplement 2—Orthographic projection; Assignment Sheet 1—Construct a top view; Assignment Sheet 2—Construct a front view; Assignment Sheet 3—Construct a right side view; Assignment Sheet 7—Make a three-view sketch

Occupation: Combination Welder	MAVCC Tasks
— List of materials	*Fundamentals of Welding*, Unit 7, Objective 15—Requirements for a formal bill of materials; Objective 16—Requirements for an informal bill of materials
B.02 Interpret welding symbol information — Type of weld required — Filler metal — Special details — Non-destructive testing requirements	GMAW and FCAW—Unit 2, Job Sheets 5 through 8, 10 through 18, 20 through 24, 27 through 36, 38 through 40, 42 through 44. *Fundamentals of Welding*, Unit 8, Basic Welding Joints and Symbols (entire unit)
Occupation: Combination Welder	**MAVCC Tasks**
Duty G: Perform Manual Oxyfuel (OF) Cutting	
G.01 Perform safety inspections of equipment and accessories — Protective clothing and equipment — Manual OFC equipment and accessories — Oxygen/fuel gas supply systems and accessories — Hand tools — Work area — Communicate hazard warnings	From Oxyacetylene Welding and Oxyfuel Cutting, Unit 2, "Oxyfuel Cutting" — Job Sheets 1, 2, 3, 4, 5, 6, 7, 8, and 9, require student to perform equipment set up to include checking oxygen and fuel cylinders, and connecting regulators. Student must connect hoses, torch body, and tip, and check all connections, including check valves, with leak detector.
G.02 Make minor external repairs to equipment and accessories (preventative maintenance only) — Manufacturer's recommendations — Company repair policy — Equipment troubleshooting —*Regulators*	In all job sheets, Unit 2 "Oxyfuel Cutting," student must set up equipment according to recommendations for both safety and operation.
G.03 Set up maual oxyfuel fas cutting operations on plain carbon steel — Regulator set for appropriate tip/fuel gas — Tip selection (size and type)	In Unit 2, "Oxyfuel Cutting," Job Sheet 3, student must make 90° cuts on plain carbon steel and stop and restart a cut. In Job Sheet 4, student must make a flame-beveled cut on mild steel plate with attention to increased oxygen pressure required for bevel cutting.
G.04 Operate manual oxyfuel cutting equipment — Control gas flow and flame size/tip — Initial lighting procedure — shut down procedures	All activities are covered in all job sheets in Unit 2, "Oxyfuel Cutting."
G.05 Perform straight cutting operations on plain carbon steel plate and pipe	All activities are covered in Job Sheets 1 and 2 in Unit 2, "Oxyfuel Cutting."

G.06 Perform shape cutting operations on carbon steel plate pipe	Unit 2, “Oxyfuel Cutting,” Job Sheet 6 requires student to lay out a pattern on mild steel place and make straight and bevel cuts.
G.07 Perform bevel cutting operations on plain carbon steel and pipe	Activity covered in Job Sheet 6 of Unit 2, “Oxyfuel Cutting.”
G.08 Remove weld metal from plain carbon steel using weld washing techniques — Tip selection to avoid destruction of metal	Use of scarfing tip to be demonstrated by instructor and used as optional activity by student.
Occupation: Shielded Metal Arc Welder	**MAVCC Tasks**
Duty H: Perform Machine Oxyfuel (OF) Gas Cutting (Track Burner)	
H.01 Perform safety inspections of equipment and accessories — Protective clothing and equipment — Hand tools — Work area — Machine oxyfuel gas cutting (track burner) equipment and accessories) — Oxygen/fuel gas supply systems and accessories — Communicate hazard warning	*Oxyacetylene Welding and Oxyfuel Cutting,* Unit 2, “Oxyacetylene and Oxyfuel Cutting.” In Job Sheet 8, “Set Up and Cut a 30° Bevel With a Track-Type Torch,” student must wear specified protective equipment including welding googles. Student must inspect area for hazards or unsafe conditions, and use a tip wrench.
H.02 Make minor external repairs to equipment and accessories — Manufacturer’s recommendations — Company repair policy — Eqipment troubleshooting *—Regulators*	In Job Sheet 8, Unit 2, “Oxyfuel Cutting,” student must follow manufacturer’s guidelines for protractor adjustment and tip tightening .
H.03 Set up machine oxyfuel cutting (track burner) operations on plain carbon steel — Regulator set for appropriate tip/fuel gas — Tip selection (size and type) — Alignment of track mechanism	In Job Sheet 8, Unit 2, “Oxyfuel Cutting,” student must select a tip according to thickness of metal as selected by instructor and align protractor and torch properly on track.
H.04 Operate machine oxyfuel gas cutting (track burner) equipment — Central gas flow — Initial igniting procedure — Travel speed — Shut down procedures	In Job Sheet 8, Unit 2, “Oxyfuel Cutting,” student must light and adjust torch in neutral flame and adjust flame to proper distance off metal. Student must determine travel speed according to tip size and thickness of metal. Student must close oxygen cutting valve, disengage the tractor drive motor, and turn motor off, then turn torch off for safe/proper shut down.
H.05 Perform straight cutting operations on plain carbon steel plate	Job Sheet 6, Unit 2, requires student to lay out a pattern on mild steel plate and cut the pattern to specifications. Pattern requires 6 straight cuts and 1 bevel cut.