

Name: _____

Directions:

Evaluate the student by checking the appropriate number or letter to indicate the degree of competency. The rating for each task should reflect **employability readiness** rather than the grades given in class.

Rating Scale:

- 3 Mastered** – can work independently with no supervision
- 2 Requires Supervision** – can perform job completely with limited supervision
- 1 Not Mastered** – requires instruction and close supervision
- N No Exposure** – no experience or knowledge in this area

NOTES:

* = Core competencies (essential for the first day on the job).

The numbers in brackets [e.g., A01] reflect the IDs used in computerized tracking software.

3	2	1	N	1. Safety	AWS (EG2.0-95)
				*1. Identify and correct or report safety hazards [A01]	
				*2. Identify and utilize proper storage for flammables [A02]	
				*3. Identify and demonstrate correct use of fire extinguishers [A03]	
				*4. Identify ventilation hazards and take corrective action [A04]	
				*5. Observe and adhere to safety labels [A05]	
				*6. Maintain, use and safely work with machines, tooling and equipment [A06]	
				*7. Use power equipment, grinder, drill press, and power saw safely/correctly [A11]	
				*8. Identify confined space and fall protection hazards [A16]	
				Other:	

3	2	1	N	2. Basic Skills	
				*1. Obtain and use reference books and charts [A07]	
				*2. Apply math to solution of welding problems – whole numbers, fractions, decimals, rounding numbers [A08]	
				*3. Apply math to solution of welding problems – geometry and trigonometry [A17]	
				*4. Identify basic hand tools [A09]	
				*5. Select, use, and care for hand tools [A10]	
				*6. Identify and store electrodes/filler materials [A12]	
				*7. Read and implement welding procedures [A13]	
				*8. Identify basic power sources [A14]	
				9. Identify structural shapes, sizes, and weights [A18]	
				Other:	

3	2	1	N	3. Print Reading	
				*1. Read and interpret basic prints [B01]	B1
				*2. Interpret welding symbols, abbreviations, and joint designs [B02]	B2
				3. Construct an exercise(s) using basic print and sketch [B03]	
				4. Make sketches – pictorial and orthographic [B04]	B1
				5. Convert English measurements to metric and vice-versa [B06]	
				Other:	

3	2	1	N	4. Layout, Fit-Up and Fabrication	
				1. Make layout of material for plate, structural, and pipe fabrication [D01]	
				*2. Prepare material for weld procedure specification (WPS) [D02]	
				3. Fabricate parts from a drawing or sketch [D03]	B3
				Other:	

3	2	1	N	5. Oxyfuel Cutting/Brazing	
				*1. Demonstrate safety procedures for oxyfuel cutting/brazing [C01]	D1-1,D2-1
				2. Describe theory of oxyfuel cutting/brazing [C20]	
				*3. Identify types of fuel gases and their applications [C02]	
				*4. Handle, make preliminary safety inspection and store cylinders properly [C03]	D1-3
				*5. Identify, select, and set up oxyfuel welding and cutting equipment [C04]	D1-3,D2-3
				*6. Light and adjust flame for welding and cutting [C05]	D1-4, D2-4
				*7. Pierce holes and cut slots [C06]	D1-5,D1-6,D2-5
				*8. Make straight 90-degree and beveled cuts on mild steel plate and pipe [C07]	D1-5, D1-7, D2-5,D2-6
				9. Make circle cuts - off hand and with guide [C08]	D1-6
				10. Lay out, cut, and fit materials (such as pipe, plate, and structural shapes) [C09]	D1-6
				11. Braze weld materials [C21]	
				*12. Prepare coupon for testing and pass visual test [C17]	
				13. Identify brazing and cutting problems, their causes, and take corrective action [C18]	D1-1,D2-2
				14. Identify and select correct brazing rod and flux, if applicable [C19]	
				Other:	

3	2	1	N	6. Shielded Metal Arc – General	
				*1. Demonstrate safety procedures for shielded metal arc welding [E01]	C1-1
				2. Describe theory of shielded metal arc welding [E02]	
				*3. Select polarity and current for electrode [E17]	C1-3
				*4. Identify and make proper electrode selection for base material and material thickness or follow WPS (weld procedure specification) [E04]	C1-3
				*5. Identify joint design and prepare material for WPS [E05]	C1-3
				6. Identify shielded metal arc welding problems, their causes, and take corrective action [E06]	C1-2,C1-3
				*7. Build pad of beads in horizontal position (qualifies flat position) [E18]	C1-4
				8. Build pad of beads in vertical position upward [E19]	C1-4
				*9. Visually inspect shielded metal arc weld [E20]	
				Other:	

3	2	1	N	7. Shielded Metal Arc – 3/8” Plate	
				*1. Make weld in 2F position with E-6010 or E-6011 (qualifies 1F position) [F04]	C1-5
				2. Make weld in 2F position with E-7024 [F05]	C1-5
				*3. Make weld in 2F position with E-7018 (qualifies 1F position) [F06]	C1-5
				4. Make weld in 3F position, vertical up, with E-6010 or E-6011 [F21]	C1-5
				5. Make weld in 3F position, vertical up, with E-7018 [F22]	C1-5
				6. Make weld in 4F position with E-6010 or E-6011 [F09]	C1-5
				7. Make weld in 4F position with E-7018 [F10]	C1-5
				8. Make weld in 2G position with E-6010 or E-6011 (qualifies 1G position) [F14]	C1-6,C1-7
				9. Make weld in 2G position with E-7018 (qualifies 1G position) [F16]	C1-6,C1-7
				10. Make weld in 3G position, vertical up, with E-6010 or E-6011 [F23]	C1-6,C1-7
				11. Make weld in 3G position, vertical up, with E-7018 [F24]	C1-6,C1-7
				12. Make weld in 4G position with E-6010 or E-6011 [F19]	C1-6
				13. Make weld in 4G position with E-7018 [F20]	C1-6
				Other:	

3	2	1	N	8. Shielded Metal Arc – Pipe (2”-6” Dia.)	
				*1. Make weld in 1G position with E-6010 or E-6011 [G01]	C1-6
				*2. Make weld in 1G position with E-7018 [G03]	C1-6

				3. Make weld in 2G position with E-6010 or E-6011 [G04]	C1-6
				4. Make weld in 2G position with E-7018 [G06]	C1-6
				5. Make weld in 5G position, vertical up, with E-6010 or E-6011 [G11]	C1-6
				6. Make weld in 5G position, vertical up, with E-7018 [G12]	C1-6
				7. Make weld in 5G position, vertical down, with E-6010 or E-6011 [G13]	C1-6
				8. Make weld in 6G position, vertical up, with E-6010 or E-6011 [G14]	C1-6
				9. Make weld in 6G position, vertical up, with E-7018 [G15]	C1-6
				Other:	

3	2	1	N	9. Shielded Metal Arc – 16 Ga. Steel	
				*1. Make weld in 1F position with E-6010 or E-6011 [H01]	C1-5
				*2. Make weld in 1F position with E-6013 [H17]	C1-5
				*3. Make weld in 2F position with E-6010 or E-6011 [H03]	C1-5
				*4. Make weld in 2F position with E-6013 [H18]	C1-5
				5. Make weld in 3F position with E-6010 or E-6011 [H05]	C1-5
				6. Make weld in 3F position with E-6013 [H06]	C1-5
				7. Make weld in 4F position with E-6010 or E-6011 [H07]	C1-5
				8. Make weld in 4F position with E-6013 [H08]	C1-5
				*9. Make butt weld in horizontal position with E-6010 or E-6011 (qualifies flat position) [H11]	
				*10. Make butt weld in horizontal position with E-6013 (qualifies flat position) [H19]	
				11. Make butt weld in vertical down position with E-6010 or E-6011 [H13]	
				12. Make butt weld in vertical down position with E-6013 [H20]	
				13. Make butt weld in overhead position with E-6010 or E-6011 [H15]	
				14. Make butt weld in overhead position with E-6013 [H21]	
				Other:	

3	2	1	N	10. Gas Metal Arc Welding – Plate and Pipe	
				*1. Demonstrate safety procedures for gas metal arc welding [I01]	C2-1
				*2. Describe theory of gas metal arc welding [I34]	
				*3. Identify, select, and safely handle shielding gases for various metals [I02]	C2-3
				*4. Adjust current, voltage, pulse, wire feed rate, and gas flow [I03]	C2-4, C2-7
				*5. Identify, select, and set up equipment [I04]	C2-2, C2-3

				*6. Identify and select solid wire electrode for carbon steel, aluminum, and stainless steel [I35]	C2-3
				*7. Make weld in 2F position with carbon steel and solid wire (qualifies 1F position) [I36]	C2-5, C2-7
				8. Make weld in 2F position with aluminum (qualifies 1F position) [I18]	
				9. Make weld in 2F position with stainless steel (qualifies 1F position) [I19]	C3-6
				10. Make weld in 3F position, vertical up, with material 3/16" or thicker [I37]	C2-5
				11. Make weld in 3F position, vertical down, with carbon steel thinner than 3/16" and solid wire [I38]	C2-5
				12. Make weld in 4F position with solid wire [I39]	C2-5
				13. Make butt weld in 1G position with aluminum [I40]	
				14. Make butt weld in 1G position with stainless steel [I41]	
				*15. Make weld in 2G position with solid wire (qualifies 1G position) [I42]	C2-6, C2-15
				16. Make weld in 3G position, vertical up, with carbon steel 3/16" or thicker [I27]	C2-6
				17. Make weld in 3G position, vertical down, with carbon steel less than 3/16" thick [I28]	C2-6
				18. Make weld in 5G position, vertical up, with carbon steel (pipe) [I30]	
				19. Make weld in 6G position, vertical up, with carbon steel (pipe) [I46]	
				*20. Identify gas metal arc welding problems, their causes and take corrective action [I32]	C2-2
				*21. Prepare gas metal arc weld for test [I33]	
				Other:	

3	2	1	N	11. Flux Cored Arc Welding	
				*1. Demonstrate safety procedures for flux cored arc welding [O01]	C3-1
				2. Describe theory of flux cored arc welding [O02]	
				*3. Identify, select, and safely handle shielding gases for various metals [O03]	C3-3
				*4. Adjust current, voltage, pulse, wire feed rate, and gas flow [O04]	C3-3,C3-4
				*5. Identify, select, and set up equipment [O05]	C3-2,C3-3
				*6. Identify and select cored wire electrodes for carbon steel and stainless steel [O06]	C3-3
				*7. Make weld in 2F position with carbon steel and cored wire (qualifies 1F position) [O07]	C3-5
				8. Make weld in 3F position, vertical up, with carbon steel and cored wire [O08]	C3-5
				*9. Make weld in 2G position with carbon steel and cored wire (qualifies 1G position) [O09]	C3-6
				10. Make weld in 3G position, vertical up, with carbon steel and cored wire [O10]	C3-6
				11. Identify welding problems, their causes, and take corrective action [O11]	
				12. Prepare flux cored arc weld for test [O12]	
				Other:	

3	2	1	N	12. Gas Tungsten Arc Welding (Carbon Steel, Stainless Steel, Aluminum)	
				*1. Demonstrate safety procedures for gas tungsten arc welding [J01]	C4-1
				2. Describe theory of gas tungsten arc welding [J35]	
				*3. Identify, select, and set up equipment and explain function [J02]	C4-2,C4-3
				*4. Identify, select, and safely handle shielding gases [J03]	C4-3
				*5. Identify, select, shape, and install tungsten electrode [J04]	C4-3
				*6. Adjust polarity, pulse, current, gas flow setting, and post flow timer and strike arc [J05]	C4-3,C4-4
				7. Identify joint design and prepare material for weld procedure specification (WPS) [J06]	
				8. Select filler rod for base material [J07]	C4-3
				9. Make weld in 2F position, stainless steel (qualifies 1F position) [J15]	C4-9
				10. Make weld in 2F position, aluminum (qualifies 1F position) [J16]	C4-7
				11. Make weld in 2F position, carbon steel (qualifies 1F position) [J17]	C4-5
				12. Make weld in 3F position, stainless steel [J18]	C4-9
				13. Make weld in 3F position, aluminum [J19]	
				14. Make weld in 3F position, carbon steel [J20]	C4-5
				15. Make weld in 2G position, stainless steel (qualifies 1G position) [J27]	C4-10
				16. Make weld in 2G position, aluminum (qualifies 1G position) [J28]	C4-8
				17. Make weld in 2G position, carbon steel (qualifies 1G position) [J29]	C4-6
				18. Make weld in 3G position, vertical up, on stainless steel [J30]	
				19. Make weld in 3G position, vertical up, on aluminum [J31]	
				20. Make weld in 3G position, vertical up, on carbon steel [J32]	C4-6
				21. Make weld in 4G position, with carbon steel [J36]	C4-6
				22. Identify gas tungsten arc welding problems, their causes, and take corrective action [J33]	C4-2
				23. Prepare gas tungsten arc weld for test [J34]	
				Other:	

3	2	1	N	13. Plasma Arc Cutting	
				*1. Demonstrate safety procedures for plasma cutting [K01]	E2-1
				*2. Describe theory of plasma cutting [K10]	
				*3. Set up and operate plasma cutting equipment [K02]	E2-3, E2-4
				*4. Lay out and make straight line cuts [K03]	

				*5. Lay out and make bevel cuts [K04]	
				6. Lay out and make circular cuts [K05]	E2-5
				7. Lay out and make pattern cuts [K06]	E2-5
				8. Lay out, cut, and bevel pipe to a 30-37 ½ degree angle [K07]	
				*9. Lay out and cut square and round solid stock [K08]	
				Other:	

3	2	1	N	14. Metallurgy and Heat Treating	
				*1. Demonstrate safety procedures for metallurgy and heat treating [L01]	
				2. Identify the classification and physical properties of ferrous and nonferrous metals [L02]	
				3. Identify and apply principles of preheating and postheating [L03]	
				4. Describe and apply principles of metallurgy in annealing, hardening, and tempering [L04]	
				5. Describe methods of testing metals [L05]	
				6. Identify types of ferrous metal by spark test [L06]	
				7. Describe the relationship between the hardness test of weld, heat-affected zone and base metal, and interpret the results [L07]	
				Other:	

3	2	1	N	15. Carbon Arc Gouging	
				*1. Demonstrate safety procedures for carbon arc gouging [M01]	E1-1
				2. Describe theory of carbon arc gouging [M04]	
				*3. Identify and select electrode size, polarity, current, and air pressure [M05]	
				4. Set up and operate carbon arc gouging equipment [M02]	E1-2, E1-3, E1-4
				*5. Remove weld material/backgouge [M03]	E1-4, E1-5
				Other:	

3	2	1	N	16. Visual Weld Testing	
				*1. Prepare sample for visual test per appropriate standard [P01]	C1-7, F1-1, F1-2
				*2. Inspect for undercut, overlap, porosity, slag, spatter, and weld size [P02]	C1-7, F1-2
				*3. Identify defects and take corrective action based on visual test [P03]	C1-7, F1-2
				Other:	

3	2	1	N	17. Destructive Testing	
				1. Prepare coupon for bend test per appropriate standard [Q01]	
				2. Perform destructive test on welds [Q02]	
				3. Identify defects and take corrective action based on destructive test [Q03]	
				Other:	

3	2	1	N	18. Non-Destructive Testing	
				1. Prepare sample for non-destructive test per appropriate standard [R01]	C1-7
				2. Perform non-destructive test per appropriate standard [R02]	C1-7
				3. Inspect for undercut, overlap, porosity, slag, splatter, and surface cracks [R03]	C1-7
				4. Identify defects and take corrective action based on non-destructive test [R04]	
				Other:	

3	2	1	N	19. Leadership Competencies**	
				1. Demonstrate an understanding of VICA, its structure and activities [N01]	
				2. Demonstrate an understanding of one's personal values [N02]	
				3. Perform tasks related to effective personal management skills [N03]	
				4. Demonstrate interpersonal skills [N04]	
				5. Demonstrate etiquette and courtesy [N05]	
				6. Demonstrate effectiveness in oral and written communication [N06]	
				7. Develop and maintain a code of professional ethics [N07]	
				8. Maintain a good professional appearance [N08]	
				9. Perform basic tasks related to securing and terminating employment [N09]	
				10. Perform basic parliamentary procedures in a group meeting [N10]	
				Other:	

****NOTE:** These competencies are addressed in the Missouri SkillsUSA-VICA Curriculum Guide lessons.

3	2	1	N	Areas of Specialization	Notes:
				1.	
				2.	
				3.	
				4.	
				5.	
				6.	
				7.	
				8.	
				9.	
				10.	