



EMPLOYABILITY PROFILE

Welding

Industry-Based Skill Standards

Proficiency Definitions

NA = Not Applicable

1 = Developing

2 = Basic

3 = Proficient

4 = Mastery

Safety in the Welding Shop	9th	10th	11th	12th	Weld Joints and Positions	9th	10th	11th	12th
Demonstrates safe work practices by selecting and using appropriate PPE, protective clothing, and shop safety features.					Identifies and applies the five basic weld joints, the weld types used on each, and the parts of fillet and groove welds while producing accurate stringer and weave beads.				
Follows established safety procedures for handling, storing, and using hazardous materials.					Demonstrates proficiency in the four welding positions by recognizing required conditions for each and practicing proper technique to meet quality and safety expectations.				
Applies proper material-handling techniques to prevent strain and injury while maintaining a clean, organized, and hazard-free welding environment.					Determines joint preparation including root opening, groove angle, weld size, contour, and finish and selects appropriate materials for welding applications.				
Welding and Cutting Processes	9th	10th	11th	12th	Welding Symbols	9th	10th	11th	12th
Identifies common welding and cutting processes, their advantages, recent developments, and the main arc welding methods and their uses.					Creates and interprets mechanical drawings by using orthographic projection and isometric views to represent three-dimensional objects accurately.				
Performs plasma arc cutting (PAC) safely and effectively by assembling required equipment, setting up and operating the torch, and evaluating cut quality.					Identifies basic weld types on ANSI/AWS welding symbols and uses symbol information to determine proper joint preparation.				
Performs resistance (spot) welding safely and effectively by selecting and preparing electrodes, following required equipment checks, and evaluating weld.					Reads and interprets welding blueprints and schemas by analyzing dimensional views, weld symbols, and material details to guide fabrication decisions.				
Physics of Welding	9th	10th	11th	12th	GMAW (MIG) and FCAW (Flux Core)	9th	10th	11th	12th
Explains how welds are created, welding methods, basic electrical principles, and the physical, chemical, and mechanical properties that affect weld quality..					Identifies key GMAW and FCAW process elements, including polarity, metal transfer methods, electrode types, shielding gases, and how the two processes compare.				
Identifies ferrous and nonferrous metals, explains how welding and heat-treating change metal properties, and uses appropriate methods to classify metals for fabrication.					Sets up and runs GMAW/FCAW equipment by assembling the outfit, adjusting settings, and using proper technique and safety practices.				
Applies knowledge of metal behavior to predict how welding variables affect distortion and strength, and selects correct measurement units when evaluating materials and processes					Produces quality welds in flat, horizontal, and vertical positions by laying beads, making fillet and butt welds, and identifying weld defects.				
Math for Welding	9th	10th	11th	12th	SMAW (Stick)	9th	10th	11th	12th
Applies essential math skills including operations with whole numbers, fractions, and decimals; fraction-decimal conversions; and calculator use.					Demonstrates use of SMAW equipment, electrical principles, electrode types, and AWS identification systems, and selects proper amperage, polarity, and electrodes for specific welds.				
Measures and converts values between US customary and SI metric units, and calculates perimeter, area, and volume of shapes to plan and verify welding and fabrication tasks.					Sets up, inspects, and operates SMAW equipment safely by assembling the welding outfit, preventing arc blow, storing electrodes correctly, and applying safety procedures.				
Converts welding-specific dimensions between measurement systems and uses mathematical reasoning to ensure precision in layout, fit-up, and fabrication.					Produces quality SMAW welds in flat, horizontal, vertical, and overhead positions by using correct angles and techniques, identifying weld defects, performing surfacing operations, and evaluating finished welds to industry standards.				
Business of Welding	9th	10th	11th	12th	Oxyfuel Gas Processes	9th	10th	11th	12th
Estimates the total cost of a welding project by calculating expenses for base materials, welding consumables, and labor.					Sets up, operates, and shuts down oxyfuel equipment safely by assembling the outfit, checking for leaks, adjusting flames, and using proper PPE.				
Explain the method and advantages of the 3 point estimation method.					Performs oxyfuel cutting and welding in multiple positions by choosing the right gases, tips, rods, and torch angles, producing quality work and identifying defects.				
Describe the steps for managing a welding project from planning to completion.					Demonstrates brazing, braze welding, and soldering by selecting proper filler metals and fluxes, preparing joints, following safety rules, and evaluating finished work.				
Fabrication	9th	10th	11th	12th	GTAW (TIG)	9th	10th	11th	12th
Plans and completes fabrication projects by estimating time and cost, interpreting drawings, and producing components to required standards.					Demonstrates knowledge of GTAW principles, equipment, torch components, electrode types, and current settings, and prepares electrodes and materials correctly for welding.				
Uses measurement skills, shop tools, lifting/rigging equipment, and thermal cutting processes safely to manufacture parts and solve fabrication problems.					Sets up and operates GTAW equipment safely by assembling the outfit and torch, adjusting shielding gas flow, applying cleaning processes, and following required safety practices.				
Demonstrates workplace readiness by following industry codes, working professionally with others, and applying skills in real-world settings.					Produces quality GTAW welds in flat, horizontal, vertical, and overhead positions by selecting proper rods and torch angles, laying beads and joints, and evaluating welds for defects.				



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WORK-BASED LEARNING			POSTSECONDARY CREDIT				
Type of WBL Experience	Year	Hours	College Course	Possible Cr.		Attained	
			WLD 121 Shielded Metal Arc Welding I	3		Y	N
			WLD 122 Gas Metal Arc Welding I	3		Y	N
			WLD 123 Gas Tungsten Arc Welding I	3		Y	N
						Y	N
			Technical Assessment		Passed		
			Written: YouScience Welding Technician I #595	Y			N
			Performance: YouScience Welding Technician I #595	Y			N
			Career Portfolio	Y			N
			CERTIFICATIONS, ENDORSEMENTS, LICENSES				
			Title	Date Obtained			
			OSHA 10 General Industry Safety certification				
TOTAL							

AWARDS, SPECIAL RECOGNITION, SCHOLARSHIPS	DIPLOMA	Date Obtained	
		Diploma Earned: Insert diploma type here	
	Technical Endorsement on Diploma?	Y	N