

Gas Metal Arc Welding

Curriculum Content Frameworks

Please note: All assessment questions will be taken from the knowledge portion of these frameworks.

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Curriculum Content Frameworks

Gas Metal Arc Welding

Grade Levels: 9-12 Course Code: 495550	Prerequisite: None
Course Description: This instructional program prepares individuals to apply technical knowledge and skills to unite or separate metal parts by heating, using a variety of techniques and equipment. Emphasis of this course will be the use of gas metal arc welders	

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Unit 1: Practicing Occupational Orientation

Hours: 10

Terminology: Assembly drawing, AWS, Combustible, EPA, Fumes, Lens, OSHA, Shield, Ventilation

CAREER and TECHNICAL SKILLS		ACADEMIC and WORKPLACE SKILLS			
What the Student Should be Able to Do		What the Instruction Should Reinforce			
Knowledge	Application	Skill Group	Skill	Description	
1.1 Define terminology related to occupational orientation	1.1.1 Use terms appropriately in context	Foundation	Reading	Applies/Understands technical words that pertain to gas metal arc welding [1.3.6]	
			Writing	Applies/Uses technical words and concepts [1.6.4] Uses words appropriately [1.6.21]	
1.2 Follow general safety guidelines	1.2.1 Demonstrate the proper use of eye and ear safety protection	Foundation	Listening	Comprehends ideas and concepts related to gas metal arc welding (1.2.1)	
	1.2.2 Demonstrate the ability to follow standard safety precautions regarding equipment used in welding		Reading	Applies information and concepts derived from printed materials (1.3.3) Comprehends written specifications and applies them to a task (1.3.9)	
	1.2.3 Construct a standard safety equipment list used in welding			Follows written directions (1.3.13)	
	1.2.4 Use the proper work attire that should be worn when welding for maximum protection	Personal Management	Science	Reads and follows instructions to operate technical equipment (1.3.19)	
	1.2.5 Apply the regulations and requirements of EPA, OSHA, and AWS concerning use, storage, and disposal of hazardous materials related to the welding industry			Follows safety guidelines (1.4.15)	
	1.2.6 Perform safety inspection of equipment and accessories			Thinking	Integrity /Honesty /Work Ethic
			Decision Making	Accepts responsibility for decision (4.2.1) Evaluates information/data to make best decision (4.2.5)	

CAREER and TECHNICAL SKILLS			ACADEMIC and WORKPLACE SKILLS		
What the Student Should be Able to Do			What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description	
1.3 Describe time or job cards, reports, or records and the importance of good record keeping	1.3.1 Prepare and maintain accurate, clear, legible, and concise records or job cards	Foundation	Arithmetic/ Mathematics	Applies addition, subtraction, and division to real-world situations (1.1.1)	
	1.3.2 Explain why documents should be filed in a timely manner for the benefit of common shop business and planning operations			Adds and multiplies to prepare an inventory [1.1.40]	
	1.3.3 Describe the importance of managing welding supplies and shop inventory			Adds and subtracts to determine inventory [1.1.41]	
1.4 Identify basic housekeeping duties related to welding	1.4.1 Perform housekeeping duties daily	Personal Management	Writing	Records data (1.6.16)	
			Integrity /Honesty /Work Ethic	Describes/Explains significance of integrity, honesty, and work ethics (3.2.4)	
1.5 Follow verbal instructions to complete work assignments	1.5.1 Demonstrate proper listening skills to include interpreting technical and standard vocabulary, taking notes, and asking informed questions when necessary	Foundation	Organizational Effectiveness	Applies knowledge to implement work-related system or practice (3.3.4)	
			Integrity /Honesty /Work Ethic	Complies with safety and health rules in a given work environment [3.2.2]	
1.6 Follow written instruction to complete work assignments	1.6.1 Demonstrate correct interpretation of technical writing, including blueprints, forms such as memos, work orders, and class handouts	Personal Management	Organizational Effectiveness	Comprehends the organization's modes of operation (3.3.5)	
			Foundation	Listening	Listens to follow directions (1.2.6)
1.6 Follow written instruction to complete work assignments	1.6.1 Demonstrate correct interpretation of technical writing, including blueprints, forms such as memos, work orders, and class handouts	Foundation	Reading	Interprets drawings to obtain factual information (1.3.17)	
			Reading	Comprehends written specifications and applies them to a task (1.3.9)	

Unit 2: Interpreting Drawing and Welding Symbols

Hours: 20

Terminology: Base metal, Center line, Detail drawing, Dimension lines, Fillet weld, Hidden edge line, Lap joint, Leader line, Object line, Orthographic projection, Plug weld, Print, Root opening, Welding Procedure Specification (WPS), Working drawings

CAREER and TECHNICAL SKILLS		ACADEMIC and WORKPLACE SKILLS			
What the Student Should be Able to Do		What the Instruction Should Reinforce			
Knowledge	Application	Skill Group	Skill	Description	
2.1 Define terminology related to interpreting drawings and welding symbols	2.1.1 Use terms appropriately in context	Foundation	Reading	Applies/Understands technical words that pertain to gas metal arc welding [1.3.6]	
			Writing	Applies/Uses technical words and concepts [1.6.4] Uses words appropriately [1.6.21]	
2.2 Identify the basic elements of a drawing or sketch	2.2.1 Apply basic elements of a sketch or drawing (line development, dimensions, and materials)	Foundation	Arithmetic/ Mathematics	Interprets charts, tables, graphs, and working drawings (1.1.25)	
	2.2.2 Demonstrate the use of the Welding Procedure Specification (WPS)		Reading	Locates pertinent information in documents, such as manuals, graphs, and schedules, to perform tasks (1.3.18)	
2.3 Define the symbols used in welding	2.3.1 Apply basic welding symbols when performing various welds, i.e., fillet weld, plug weld, and lap weld	Foundation	Reading	Comprehends written specifications and applies them to a task (1.3.9)	
				Locates pertinent information in documents, such as manuals, graphs, and schedules, to perform tasks (1.3.18)	
2.4 Discuss how to fabricate simple parts from a drawing or sketch	2.4.1 Construct basic fabrication components (e.g., materials, dimensions, and machine application) and fabrication of simple parts	Foundation	Reading	Uses appropriate materials and techniques as specified (1.3.20)	
				Uses equipment and techniques for gas metal arc welding [1.4.23]	

Unit 3: Demonstrating Gas Metal Arc Welding (GMAW, GMAW-S)

Hours: 39

Terminology: AC, Automatic welding, Collett, Conductivity, Contact tube, DC, DCEP, Deoxidizer, Downhill, Electrode lead, Flux, Groove weld, Horizontal position, Hydrogen embrittlement, Nozzle, Preflow, Postflow, Silicon-controlled rectifier, Sinusoidal wave, SMAW, Stepdown transformer, Tack weld, Tensile strength, Torch, Vertical position, Weld pass, Welding rod, Workpiece

CAREER and TECHNICAL SKILLS		ACADEMIC and WORKPLACE SKILLS			
What the Student Should be Able to Do		What the Instruction Should Reinforce			
Knowledge	Application	Skill Group	Skill	Description	
3.1 Define terminology related to the demonstration of arc welding (GMAW, GMAW-S)	3.1.1 Use terms appropriately in context	Foundation	Reading	Applies/Understands technical words that pertain to gas metal arc welding [1.3.6]	
			Writing	Applies/Uses technical words and concepts [1.6.4] Uses words appropriately [1.6.21]	
3.2 Identify the theoretical principles behind GMAW, GMAW-S	3.2.1 Make minor external repairs to GMAW equipment and accessories	Thinking	Knowing How to Learn	Uses available resources to acquire new skills or improve skills (4.3.4)	
3.3 Describe the safety inspections performed on equipment and accessories	3.3.1 Inspect visually GMAW equipment (welding leads, which include ground and electrode cable) and accessories (clothing, hand tools, and base metal) on a daily basis	Foundation	Reading	Follows written directions (1.3.13) Identifies relevant details, facts and specifications (1.3.16)	
3.4 Identify minor external repairs to equipment and accessories	3.4.1 Operate accessories including ground lead and electrode holder	Foundation	Reading	Follows written directions (1.3.13) Identifies relevant details, facts and specifications (1.3.16)	
	3.4.2 Show repairs to GMAW equipment and accessories made in accordance with manufacturer's recommendation and school policy			Uses appropriate materials and techniques as specified (1.3.20)	
3.5 Describe the setup for gas metal arc welding operations and base metal preparation on carbon steel	3.5.1 Use oral or written instructions	Foundation	Listening	Listens to follow directions (1.2.6)	
	3.5.2 Use proper electrode, adjusting to proper polarity and current		Reading	Follows written directions (1.3.13) Identifies relevant details, facts and specifications (1.3.16)	
	3.5.3 Demonstrate the ability to apply the principles of operation of gas metal arc welding to a simple welding job		Reads and follows instructions to operate technical equipment (1.3.19)		

CAREER and TECHNICAL SKILLS		ACADEMIC and WORKPLACE SKILLS			
What the Student Should be Able to Do		What the Instruction Should Reinforce			
Knowledge	Application	Skill Group	Skill	Description	
3.6 Describe how to safely use gas metal arc welding equipment	3.6.1 Demonstrate proper operation of GMAW equipment using proper material to fabricate simple weld pass 3.6.2 Utilize protective clothing and accessories	Foundation	Reading	Reads and follows instructions to operate technical equipment (1.3.19) Uses equipment and techniques for gas metal arc welding [1.4.23]	
3.7 Discuss single pass fillet welds, all positions, on carbon steel, using short circuit transfer	3.7.1 Demonstrate proper single pass fillet welds by adherence to welding techniques in both positions including wire selection, gun angle, material preparation 3.7.2 Use the proper equipment and hand tools to complete single pass fillet welds	Foundation	Science	Applies knowledge to complete a practical task (1.4.3) Uses equipment and techniques for gas metal arc welding [1.4.23]	
3.8 Discuss V-groove welds, all positions, on carbon steel, using short circuit transfer	3.8.1 Demonstrate proper V-groove welds by adherence to welding techniques in all positions and wire selection, gun angle, and material preparation 3.8.2 Use the proper equipment and hand tools to complete various V-groove welds	Foundation	Science	Applies knowledge to complete a practical task (1.4.3) Uses equipment and techniques for gas metal arc welding [1.4.23]	
3.9 Identify 1F-2F single pass welds on carbon steel, using spray transfer	3.9.1 Demonstrate proper 1F-2F single pass welds by adherence to welding techniques in both positions including wire selection, gun angle, material preparation 3.9.2 Use the proper equipment and hand tools to complete various 1F-2F single pass welds on carbon steel, using spray transfer	Foundation	Science	Applies knowledge to complete a practical task (1.4.3) Uses equipment and techniques for gas metal arc welding [1.4.23]	
3.10 Identify 1G welds on carbon steel, limited thickness, using spray transfer	3.10.1 Demonstrate proper 1G welds by adherence to welding techniques in this position including wire selection, gun angle, and material preparation 3.10.2 Use the proper equipment and hand tools to complete various 1G welds on carbon steel	Foundation	Science	Applies knowledge to complete a practical task (1.4.3) Uses equipment and techniques for gas metal arc welding [1.4.23]	

Unit 4: Demonstrating Flux-Core Arc Welding (FCAW-G)

Hours: 39

Terminology: FCAW, Slag, Weldpool

CAREER and TECHNICAL SKILLS		ACADEMIC and WORKPLACE SKILLS			
What the Student Should be Able to Do		What the Instruction Should Reinforce			
Knowledge	Application	Skill Group	Skill	Description	
4.1 Define terminology related to flux-core arc welding (FCAW-G)	4.1.1 Use terms appropriately in context	Foundation	Reading	Applies/Understands technical words that pertain to gas metal arc welding [1.3.6]	
			Writing	Applies/Uses technical words and concepts [1.6.4] Uses words appropriately [1.6.21]	
4.2 Describe necessary steps to performing safety inspections of equipment and accessories	4.2.1 Perform inspection on equipment (drive rollers, contact tips, and gauges) and accessories (clothing, hand tools, base metal) daily	Foundation	Reading	Uses appropriate materials and techniques as specified (1.3.20)	
			Science	Uses equipment and techniques for gas metal arc welding [1.4.23]	
4.3 Identify the theoretic principles behind FCAW-G	4.3.1 Demonstrate proper V-groove welds by adherence to welding techniques in all positions and including electrode identification, electrode angle, material preparation	Foundation	Reading	Uses appropriate materials and techniques as specified (1.3.20)	
			Science	Uses equipment and techniques for gas metal arc welding [1.4.23]	
4.4 Identify minor external repairs to equipment and accessories	4.4.1 Perform minor repairs to FCAW equipment, such as changing contact tips, drive rollers, and gas diffusers made to manufacturers' recommendations, to school policies	Foundation	Reading	Uses appropriate materials and techniques as specified (1.3.20)	
			Science	Uses equipment and techniques for gas metal arc welding [1.4.23]	
4.5 Describe how flux-core arc welding equipment operates	4.5.1 Demonstrate proper operation of FCAW equipment by adherence to a welding assignment, selection of proper material, and utilization of protective clothing and accessories	Foundation	Science	Applies knowledge to complete a practical task (1.4.3)	
				Uses equipment and techniques for gas metal arc welding [1.4.23]	

CAREER and TECHNICAL SKILLS		ACADEMIC and WORKPLACE SKILLS			
What the Student Should be Able to Do		What the Instruction Should Reinforce			
Knowledge	Application	Skill Group	Skill	Description	
4.6 Describe setup for flux-core arc welding operations and base metal preparation on carbon steel	4.6.1 Use oral or written instructions	Foundation	Listening	Listens to follow directions (1.2.6)	
	4.6.2 Use appropriate protective clothing		Reading	Follows written directions (1.3.13)	
	4.6.3 Prepare equipment and tanks to proper voltage and current		Science	Uses equipment and techniques for gas metal arc welding [1.4.23]	
	4.6.4 Apply principles of FCAW operation				
4.7 Identify single pass fillet welds, all positions, on carbon steel	4.7.1 Demonstrate fillet welds by adherence to welding techniques	Foundation	Science	Applies knowledge to complete a practical task (1.4.3) Uses equipment and techniques for gas metal arc welding [1.4.23]	
4.8 Label V-Grove welds, all positions, on carbon steel	4.8.1 Demonstrate V-grove welds by adhering to welding techniques	Foundation	Science	Applies knowledge to complete a practical task (1.4.3) Uses equipment and techniques for gas metal arc welding [1.4.23]	

Unit 5: Career and Technical Student Organizations (SkillsUSA / HOSA)

Hours: 12

Terminology: Assessment, Behavior, Business meeting, Career, Critique, Customers, Expectation, Image, Interview, Job application, Journal, Management, Mentor, Organizational chart, Parliamentary procedure, Portfolio, Presentaton, Résumé, Self-motivation, Short-term goals, Stress

CAREER and TECHNICAL SKILLS			ACADEMIC and WORKPLACE SKILLS		
What the Student Should be Able to Do			What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description	
5.1 Define terminology related to student organizations	5.1.1 Use terms appropriately in context	Foundation	Reading	Applies/Understands technical words that pertain to student organizations (SkillsUSA / HOSA) [1.3.6]	
			Writing	Applies/Uses technical words and concepts [1.6.4] Uses words appropriately [1.6.21]	
5.2 Outline a self-assessment and identify individual learning styles	5.2.1 Show individual strengths	Interpersonal	Leadership	Conveys attitudes and values of group to others [2.4.3]	
	5.2.2 Show areas in need of improvement	Thinking	Problem Solving	Identifies possible reasons for problem [4.4.6]	
5.3 Describe self-motivation techniques and establish short-term goals	5.3.1 Prepare a list of short-term goals	Personal Management	Self-Esteem	Develops/Initiates a plan for self-improvement [3.5.4]	
	5.3.2 Discuss ways to change or improve lifestyle appearance and behavior	Thinking	Creative Thinking	Identifies new goals and objectives [4.1.8]	
5.4 Give examples of individual time-management skills	5.4.1 Prepare and maintain a time journal	Foundation	Writing	Prepares a complex document in a concise manner [1.6.12]	
	5.4.2 Outline ways to improve time management skills	Thinking	Problem Solving	Devises and implements a plan of action to resolve problem [4.4.3] Recognizes/Defines problem [4.4.8]	
5.5 Predict future occupations	5.5.1 Use the internet to explore for career opportunities within specified fields of study	Foundation	Reading	Draws conclusions from what is read [1.3.12]	
			Writing	Summarizes written information [1.6.17]	
	5.5.2 Prepare a presentation on a specified career area	Personal Management	Career Awareness, Development, and Mobility	Explores career opportunities [3.1.6]	
		Thinking	Creative Thinking	Prepares presentation based on subject research, interviews, surveys [4.1.10]	

CAREER and TECHNICAL SKILLS		ACADEMIC and WORKPLACE SKILLS			
What the Student Should be Able to Do		What the Instruction Should Reinforce			
Knowledge	Application	Skill Group	Skill	Description	
5.6 Define an awareness of cultural diversity and equity issues	5.6.1 Research a tradition modeled by individual's family	Foundation	Reading	Uses written resources [books, dictionaries, directories] to obtain factual information [1.3.23]	
	5.6.2 Establish personal philosophy statements regarding gender equity	Interpersonal	Cultural Diversity	Discusses contributions and innovations made by women and/or minority groups [2.2.2] Works effectively with men and women from diverse backgrounds – ethnic, social, educational, etc. [2.2.5]	
5.7 Identify the customer	5.7.1 Differentiate between External and Internal customers	Interpersonal	Customer Service	Recognizes effects of positive/negative attitudes on customers [2.3.7]	
	5.7.2 Identify factors which contribute to poor customer relationships	Thinking	Decision Making	Shows initiative and courtesy in meeting and working with customers [2.3.8] Evaluates information/data to make best decision [4.2.5]	
5.8 Name the benefits of doing a community service project	5.8.1 Outline ways to become involved in the community	Foundation	Speaking	Organizes ideas and communicates oral messages to listeners [1.5.7]	
	5.8.2 Develop a community service project	Interpersonal	Teamwork	Contributes to group with ideas, suggestions, and effort [2.6.2]	
5.9 Describe effective communication with others	5.9.1 Note personal barriers to listening	Thinking	Problem Solving	Recognizes/Defines problem [4.4.8]	
	5.9.2 Relate a personal plan to overcome barriers to listening			Revises plan of action indicated by findings [4.4.9]	
5.10 Give locations for a shadowing activity	5.10.1 Summarize and relate an experience of job shadowing activity	Interpersonal	Leadership	Encourages/Motivates members of a group or team [2.4.6]	
5.11 Identify the components of an employment portfolio	5.11.1 Use parts of a portfolio	Foundation	Writing	Completes form accurately [1.6.7]	
	5.11.2 Compile a personal employment portfolio			Composes and creates documents – letters, manuals, reports, proposals, graphs, flow charts, etc. [1.6.8]	
5.12 List proficiency in program competencies	5.12.1 Construct an interpersonal competency assessment	Foundation	Writing	Analyzes data, summarizes results, and makes conclusions [1.6.2]	
5.13 Describe how to measure / modify short-term goals	5.13.1 Show steps to pursue short-term goal(s)	Thinking	Creative Thinking	Identifies new goals and objectives [4.1.8]	
5.14 Identify stress sources	5.14.1 Prepare a list of personal sources of stress	Foundation	Writing	Communicates thoughts, ideas, or facts in written form in a clear, concise manner [1.6.6]	
	5.14.2 Outline techniques to cope with individual sources of stress	Thinking	Problem Solving	Demonstrates logical reasoning in reaching a conclusion [4.4.2]	

CAREER and TECHNICAL SKILLS		ACADEMIC and WORKPLACE SKILLS		
What the Student Should be Able to Do		What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
5.15 List characteristics of a positive image	5.15.1 List behaviors and traits that lead to a positive image	Foundation	Reading	Determines what information is needed [1.3.10]
	5.15.2 Note behaviors and traits that lead to a negative image	Personal Management	Self-Esteem	Comprehends the importance of a positive self-concept [3.5.1] Develops/Initiates a plan for self-improvement [3.5.4]
5.16 Define government, professional organizations and trade unions	5.16.1 Prepare a presentation for the state governor, legislators, or senators about professional student organizations	Foundation	Speaking	Communicates a thought, idea, or fact in spoken form [1.5.5] Participates in conversation, discussion, and group presentations [1.5.8]
	5.16.2 Prepare a presentation pertaining to professional student organizations and specific career areas			
5.17 Describe how team skills can be applied to a group project	5.17.1 Form a team to develop a class project	Interpersonal	Teamwork	Works effectively with others to reach a common goal [2.6.6]
5.18 Outline how to observe and critique a meeting	5.18.1 Attend a formal meeting held within the community	Foundation	Writing	Composes and creates documents – letters, manuals, reports, proposals, graphs, flow charts, etc. [1.6.8]
	5.18.2 Prepare a critique of the meeting attended	Interpersonal	Customer Service	Shows initiative and courtesy in meeting and working with customers [2.3.8]
5.19 List business meeting skills	5.19.1 Relate the basic rules required to ensure an orderly and business-like meeting	Foundation	Speaking	Organizes ideas and communicates oral messages to listeners [1.5.7]
	5.19.2 Demonstrate with role-playing to illustrate appropriate meeting skills	Interpersonal	Leadership	Conveys attitudes and values of group to others [2.4.3] Influences group behavior [2.4.8]
5.20 Define social etiquette	5.20.1 Demonstrate with role-playing appropriate social behavior	Interpersonal	Leadership	Conveys attitudes and values of group to others [2.4.3] Helps an individual or group challenge existing procedures, policies, or authority [2.4.7]
	5.20.2 Differentiate between good and bad manners			

CAREER and TECHNICAL SKILLS		ACADEMIC and WORKPLACE SKILLS		
What the Student Should be Able to Do		What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
5.21 Outline a survey for employment opportunities	5.21.1 Compile information on a particular employment opportunity of interest	Foundation	Writing	Presents own opinion in written form in a clear, concise manner [1.6.14]
	5.21.2 Perform an internet search of a specific career area	Personal Management	Career Awareness, Development, and Mobility	Develops skills to locate, evaluate, and interpret career information [3.1.4]
5.22 Select a professional journal for review and develop a three to five minute presentation	5.22.1 Prepare a presentation on the content, purpose, and distribution of a particular professional journal	Foundation	Writing	Prepares a complex document in a concise manner [1.6.12]
5.23 Identify customer expectations	5.23.1 List customer expectations	Interpersonal	Customer Service	Applies human relations skills in real-life situations [2.3.1]
	5.23.2 Discover the consequences of unmet customer expectations			Recognizes effects of positive/negative attitudes on customers [2.3.7] Works with customers to satisfy their expectations [2.3.9]
5.24 List parts of a job application	5.24.1 Prepare a job application from various businesses in the community	Foundation	Reading	Determines what information is needed [1.3.10]
	5.24.2 Demonstrate a mock job interview		Speaking	Communicates a thought, idea, or fact in spoken form [1.5.5] Uses verbal language and other cues such as body language appropriate in style, tone, and level of complexity to the audience and the occasion [1.5.14]
5.25 Define mentor	5.25.1 Share your ideas on the term mentor	Interpersonal	Leadership	Delegates responsibility to an individual within the group or team [2.4.4]
	5.25.2 Outline ways in which a mentor can help an individual meet career goals			Encourages/Motivates members of a group or team [2.4.6] Contributes to group with ideas, suggestions, and effort [2.6.2]
			Teamwork	

CAREER and TECHNICAL SKILLS		ACADEMIC and WORKPLACE SKILLS		
What the Student Should be Able to Do		What the Instruction Should Reinforce		
Knowledge	Application	Skill Group	Skill	Description
5.26 Outline your employment portfolio	5.26.1 Construct a personal employment portfolio	Foundation	Writing	Composes and creates documents – letters, manuals, reports, proposals, graphs, flow charts, etc. [1.6.8] Produces neat, legible document from typewriter or computer [1.6.15] Summarizes written information [1.6.17] Uses language, style, organization, and format appropriate to subject matter, purpose, and audience [1.6.19]
5.27 Identify supervisory and management roles in an organization	5.27.1 Prepare an organizational chart	Foundation	Writing	Produces neat, legible document from typewriter or computer [1.6.15]
	5.27.2 Outline the responsibilities of managers and supervisors	Interpersonal	Leadership	Helps an individual or group challenge existing procedures, policies, or authority [2.4.7]
5.28 Outline safety issues	5.28.1 Research safety issues within a given career area	Foundation	Reading	Identifies relevant details, facts and specifications [1.3.16]
		Personal Management	Science	Follows safety guidelines [1.4.15]
5.29 Define task and competency	5.29.1 Evaluate your proficiency in program	Personal Management	Integrity /Honesty /Work Ethic	Follows established rules, regulations, and policies [3.2.5]
	5.29.2 Prepare a list of competencies associated with a specified career area	Thinking	Integrity /Honesty /Work Ethic	Keeps one's word when it is given [3.2.6]
			Creative Thinking	Prepares presentation based on subject research, interviews, surveys [4.1.10]

Glossary

Unit 1: Practicing Occupational Orientation

1. Assembly drawing - a drawing that shows a product completely assembled, with all subassemblies and parts
2. AWS - American Welding Society
3. Combustible - flammable, easily ignited
4. EPA - Environmental Protection Agency
5. Fumes - vapor, gas or smoke
6. Lens - specially treated glass or plastic through which a welder may look at an intense flame without being injured by the harmful rays or glare
7. OSHA - Occupational Safety and Health Administration
8. Shield - an eye and face protector; it enables a person to look directly at the electric arc through a special lens without being harmed
9. Ventilation - the admission of fresh air flow

Unit 2: Interpreting Drawing and Welding Symbols

1. Base metal - metal to be welded, cut, or brazed
2. Center line - the center of a radius, circle or cylinder
3. Detail drawing - a drawing that shows the shape and size of each small part of an assembly
4. Dimension lines - lines placed about .5" away from the outer edge of the object - a long , thin arrowhead appears at each end of a dimension line
5. Fillet weld - metal fused into a corner formed by two pieces of metal whose welded surfaces are approximately 90 degrees to each other
6. Hidden edge line - lines hidden from view by material in front of them - made up of a series of 1/8" dashes-usually about .02" thick
7. Lap joint - a joint in which the edges of the two metals to be joined overlap
8. Leader line - the size of a corner radius or size for a hole is given by using a line that points to the edge of the circle and leads the reader out to a clear area on the drawing where a diameter or dimension is given
9. Object line - the solid black outline of the object
10. Orthographic projection - a method of making a working drawing and projecting the sized from one view to another
11. Plug weld- a weld made through and in a round hole that has been cut into one piece of metal that is lapped over another piece
12. Print - a copy of a drawing or plan, previously, referred to as a blueprint
13. Root opening - the space at the bottom of the joint between the pieces being welded
14. Welding Procedure Specification (WPS) - a document that lists all the variables and procedures required to perform a specific weld; this is done to ensure the acceptable repeatability of the weld when performed by trained and qualified professional welders
15. Working drawings - drawings that are used to produce a part or product; they may be detail or assembly drawings

Unit 3: Demonstrating Gas Metal Arc Welding (GMAW, GMAW-S)

1. AC - alternating current
2. Automatic welding - welding with equipment that needs only occasional or no monitoring and no manual adjustments during the process
3. Collett - part used to hold an electrode in the torch body
4. Conductivity - the ability of a conductor to carry current
5. Contact tube - the part of the welding gun that transfers the electrical current from the welding gun to the electrode wire
6. DC - direct current,
7. DCEP - direct current that flows from the electrode to the work
8. Deoxidizer: - a substance which, when added to molten metal, removes either free or combined oxygen
9. Downhill - welding with a downward progression
10. Electrode lead - electrical conductor between the welding machine and the electrode holder
11. Flux - material used to prevent, dissolve, or help remove oxide and other undesirable surface substances
12. Groove weld - welding rod fused into a joint which has the base metal removed to form a V, U, or J trough at the edge of the metals to be joined
13. Horizontal position - weld performed on a horizontal seam that is at least partially on a vertical surface
14. Hydrogen embrittlement - a low-ductility condition that occurs in metals due to absorption of hydrogen
15. Nozzle - device that directs a shielding medium or gas
16. Preflow - the flow of shielding gas that begins before the arc is struck
17. Postflow - the timed flow of shielding gas after the arc is extinguished; this is done to protect the hot electrode and weld area from oxidation
18. Silicon controlled rectifier - semiconductor device with three terminals that can be switched from conducting through the use of signals controlled by logic gates
19. Sinusoidal wave - in alternating current, a plot of time against amperage flow - an ac sine wave pattern
20. SMAW - shielded metal arc welding
21. Stepdown transformer - a device used to reduce a higher voltage to a lower voltage - as the voltage decreases, amperage increases, and vice-versa
22. Tack weld - small weld used to temporarily hold components together

23. Tensile strength - maximum pull stress in pounds per square inch or megapascals that a specimen will withstand
24. Torch - mechanical device that a welder holds during gas welding and cutting and from which issue the gases that are burned to produce heat - the device held during some arc welding processes is also known as a torch
25. Vertical position - type of weld in which the welding is done in a vertical seam and on a vertical surface
26. Weld pass - single progression of a weld or surfacing operation - the result of a pass is a bead, layer, or spray deposit
27. Welding rod - metal rod that is melted into the weld metal
28. Workpiece - the part that is to be welded, brazed, cut, or surfaced

Unit 4: Demonstrating Flux-Core Arc Welding (FCAW-G)

1. FCAW - flux cored arc welding
2. Slag - nonmetallic byproduct of smelting and refining made up of flux and nonmetallic impurities - also, material that forms on the underside of an oxyfuel gas or arc cut
3. Weldpool - portion of the weld that is molten due to the heat of welding

Unit 5: Career and Technical Student Organizations (SkillsUSA / HOSA)

1. Assessment - to determine the value, significance, or extent; to judge
2. Behavior - the actions one takes, how one conducts oneself
3. Business meeting - planned gathering of individuals (occupational, work, trade, or organizational) that is methodical, and systematic; the meeting is for a common purpose
4. Career - a chosen pursuit, the general course of progression of one's working life
5. Critique - a critical review or commentary
6. Customers - one who buys goods or services
7. Expectation - eager anticipation; to look forward to the probable occurrence or appearance of
8. Image - the public's opinion or concept of something, to mirror or reflect
9. Interview - a formal meeting in person arranged for the assessment of the qualifications of an applicant
10. Job application - a form or document used by an employer when hiring prospective employees
11. Journal - a personal record of occurrences, experiences, reflections kept on a regular basis
12. Management - the person or persons who control or direct a business or other enterprise
13. Mentor - a wise or trusted counselor or teacher
14. Organizational chart - a chart that reflects the structure through which individuals cooperate systematically to conduct business
15. Parliamentary procedure - a meeting held in accordance with the rules and customs of a parliament
16. Portfolio - a portable case for holding materials, such as photographs, drawings, or other materials that represent a person's work
17. Presentation - a performance; a formal introduction' the process of offering for consideration or display
18. Résumé - a brief account of one's professional or work experience and qualifications often submitted with a job application
19. Self-motivation - the act or process of motivating oneself
20. Short-term goals - goals or targets that are reachable with a short or brief period of time
21. Stress - an extreme pressure, strain, or difficulty