

**Maine Department of Education
Career and Technical Education**

Welding; CIP: 48.0508
American Welding Society AWS: Framework, Duties and Tasks
Intersections with
Maine College and Career Readiness-English Language Arts Standards

<p style="text-align: center;">Welder: Duties, Skills, and Tasks</p>	<p style="text-align: center;">English Language Arts- Reading, Writing, Speaking and Listening (CCSS)</p>	<p style="text-align: center;">Demonstration of Proficiency (Possible Evidence, Project, Performance Assessment, Certification etc.)</p>	<p style="text-align: center;">Maine Learning Results- Guiding Principles, and Career and Education Development</p>
<p>1. Occupational Orientation</p>			
<p>a. Prepare time or job cards, reports or records.</p> <p>b. Perform house keeping duties.</p> <p>c. Follow verbal instructions to complete work assignments.</p> <p>d. Follow written instructions to complete work assignments.</p>	<p>Resumes/Cover Letters (optional) WHST.4.11-12: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p> <p>WHST.5.11-12: Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.</p> <p>Search for Welding Shop Parts (optional) WHST.8.11-12: Gather relevant information from multiple authoritative print and digital sources, using advanced searches effectively; assess the strengths and</p>	<p>Through this cluster, students might write resumes and cover letters, research specific welding parts/components, create portfolios containing work samples, participate in peer teaching/presentation activities, listen to/understand DVD instruction, and participate in problem solving activities that may require the use of multiple sources.</p>	<p>A. A clear and effective communicator who:</p> <ol style="list-style-type: none"> 1. Demonstrates organized and purposeful communication in English and at least one other language (without “one other language,”) 2. Uses evidence and logic appropriately in communication 3. Adjusts communication based on the audience <p>B. A self-directed and lifelong learner who:</p> <ol style="list-style-type: none"> 1. Recognizes the need for information and locates and evaluates resources 4. Demonstrates initiative and independence

	<p>limitations of each source in terms of the specific task, purpose, and audience; integrate information into the text selectively to maintain the flow of ideas, avoiding plagiarism and overreliance on any one source and following a standard format for citation.</p> <p>(This is certainly gathering “relevant information” from “multiple authoritative...sources,” though it isn’t “using advanced searches effectively.”</p> <p>Portfolio of Work Samples/ Summaries of Welds and Procedures (optional)</p> <p>WHST.4.11-12: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p> <p>WHST.5.11-12: Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.</p>		<p>E. An integrative and informed thinker who:</p> <p>2. Evaluates and synthesizes information from multiple sources</p> <p>3. Applies ideas across disciplines</p>
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	<p>Peer Teaching/Introduction of Tech Course to Younger Students/Presenting a Project (optional)</p> <p>SL.1.11-12: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.</p> <p>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.</p> <p>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.</p> <p>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.</p>		
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	<p>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.</p> <p>DVD Instruction (optional) Possibly SL.3.11-12: Evaluate a speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used.</p> <p>Problem Solving Activity (optional) RST.1.11-12: Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.</p> <p>RST.7.11-12: Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.</p>		
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	<p>RST.8.11-12: Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p>		
<p>2. Safety and Health of Welders</p>			
<p>a. Demonstrate proper use and inspection of Personal Protection Equipment (PPE).</p> <p>b. Demonstrate proper safe operation practices in the work area.</p> <p>c. Demonstrate proper use and inspection of ventilation equipment.</p> <p>d. Demonstrate proper Hot Zone operation.</p> <p>e. Demonstrate proper work actions for working in confined spaces.</p> <p>f. Demonstrate proper use of precautionary labeling and MSDS information.</p> <p>g. Demonstrate proper inspection and operation of equipment used for each required welding and thermal cutting process (This is best done as a part of the process</p>	<p>Peer Teaching/Introduction of Tech Course to Younger Students/Presenting a Project (optional)</p> <p>SL.1.11-12: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.</p> <p>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.</p> <p>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and</p>	<p>Through this cluster, students might participate in peer teaching activities/reteach OSHA 10-hour, read and understand the central ideas and vocabulary in various texts, listen to/understand DVD instruction, participate in problem solving activities that may require the use of multiple sources, and verbally present information.</p>	<p>A. A clear and effective communicator who:</p> <ol style="list-style-type: none"> 1. Demonstrates organized and purposeful communication in English and at least one other language (without "one other language,") 2. Uses evidence and logic appropriately in communication 3. Adjusts communication based on the audience <p>B. A self-directed and lifelong learner who:</p> <ol style="list-style-type: none"> 1. Recognizes the need for information and locates and evaluates resources 4. Demonstrates initiative and independence

<p>module/unit for each of the required welding and thermal cutting processes).</p>	<p>deadlines, and establish individual roles as needed.</p> <p>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.</p> <p>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.</p> <p>Handout/Textbook/Manual Reading (optional)</p> <p>RST.2.11-12: Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</p> <p>RST.4.11-12: Determine the meaning of symbols, key terms, and other domain specific words and phrases as they are used in a</p>		<p>C. Creative and practical problem solver who:</p> <ol style="list-style-type: none"> 1. Observes and evaluates situations to define problems. <p>D. A responsible and involved citizen who:</p> <ol style="list-style-type: none"> 2. Accepts responsibility for personal decisions and actions <p>E. An integrative and informed thinker who:</p> <ol style="list-style-type: none"> 2. Evaluates and synthesizes information from multiple sources 3. Applies ideas across disciplines
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	<p>specific scientific or technical context relevant to grades 11–12 texts and topics</p> <p>DVD Instruction (optional) Possibly SL.3.11-12: Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used.</p> <p>Problem Solving Activity (optional) RST.1.11-12: Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.</p> <p>RST.7.11-12: Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.</p> <p>RST.8.11-12: Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or</p>		
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	<p>challenging conclusions with other sources of information.</p> <p>Oral Demonstration of Skill (optional)</p> <p>SL.1.11-12: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.</p> <p>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.</p> <p>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.</p> <p>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify,</p>		
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	<p>verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.</p> <p>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.</p>		
<p>3. Drawing and Welding Symbol Interpretation</p>			
<p>a. Interpret basic elements of a drawing or sketch.</p> <p>b. Interpret welding symbols information.</p> <p>c. Fabricate parts from a drawing or sketch.</p>	<p>Handout/Textbook/Manual Reading (optional)</p> <p>RST.2.11-12: Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</p> <p>RST.4.11-12: Determine the meaning of symbols, key terms, and other domain specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.</p>	<p>Through this cluster, students might read and understand the central ideas and vocabulary in various texts, listen to/ understand DVD instruction, participate in problem solving activities that may require the use of multiple sources, and verbally present information.</p>	<p>A. A clear and effective communicator who:</p> <ol style="list-style-type: none"> 1. Demonstrates organized and purposeful communication in English and at least one other language (without “one other language,”) 2. Uses evidence and logic appropriately in communication 3. Adjusts communication based on the audience <p>B. A self-directed and lifelong learner who:</p> <ol style="list-style-type: none"> 3. Applies knowledge in

	<p>DVD Instruction (optional) Possibly SL.3.11-12: Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used.</p> <p>RST.4.11-12: Determine the meaning of symbols, key terms, and other domain specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.</p> <p>Problem Solving Activity (optional) RST.1.11-12: Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.</p> <p>RST.7.11-12: Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.</p> <p>RST.8.11-12: Evaluate the</p>		<p>new contexts</p> <p>C. Creative and practical problem solver.</p> <p>E. An integrative and informed thinker who:</p> <ol style="list-style-type: none"> 2. Evaluates and synthesizes information from multiple sources 3. Applies ideas across disciplines
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	<p>hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p> <p>Oral Demonstration of Skill (optional)</p> <p>SL.1.11-12: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.</p> <p>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.</p> <p>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.</p> <p>c. Propel conversations by posing and responding to questions that probe reasoning and evidence;</p>		
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	<p>ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.</p> <p>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.</p>		
<p>4. Shielded Metal Arc Welding (SMAW)</p>			
<p>a. Perform safety inspections of SMAW equipment and accessories.</p> <p>b. Make minor external repairs to SMAW equipment and accessories.</p> <p>c. Set up for SMAW operations on carbon steel.</p> <p>d. Operate SMAW equipment on carbon steel.</p> <p>e. Make fillet welds in all positions on carbon steel.</p> <p>f. Make groove welds in all positions on carbon steel.</p> <p>g. Pass SMAW welder performance qualification test (2G and 3G, uphill, limited</p>	<p>Handout/Textbook/Manual Reading (optional)</p> <p>RST.2.11-12: Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</p> <p>RST.4.11-12: Determine the meaning of symbols, key terms, and other domain specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.</p>	<p>Through this cluster, students might read and understand the central ideas and vocabulary in various texts, listen to/understand DVD instruction, participate in problem solving activities that may require the use of multiple sources, participate in peer teaching/presentation activities, and verbally present information.</p>	<p>A. A clear and effective communicator who:</p> <ol style="list-style-type: none"> 1. Demonstrates organized and purposeful communication in English and at least one other language (without “one other language.”) 2. Uses evidence and logic appropriately in communication 3. Adjusts communication based on the audience <p>B. A self-directed and lifelong learner who:</p> <ol style="list-style-type: none"> 1. Recognizes the need

<p>thickness test plates) on carbon steel.</p>	<p>DVD Instruction (optional) Possibly SL.3.11-12: Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used.</p> <p>Problem Solving Activity (optional) RST.1.11-12: Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.</p> <p>RST.7.11-12: Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.</p> <p>RST.8.11-12: Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p> <p>Peer Teaching/Introduction of</p>		<p>for information and locates and evaluates resources</p> <p>4. Demonstrates initiative and independence</p> <p>5. Demonstrates flexibility including the ability to learn, unlearn and relearn</p> <p>6. Demonstrates reliability and concern for quality</p> <p>C. Creative and practical problem solver who:</p> <p>1. Observes and evaluates situations to define problems</p> <p>3. Identifies patterns, trends and relationships that apply to solutions</p> <p>4. Generates a variety of solutions, builds a case for a best response and critically evaluates the effectiveness of the response</p> <p>6. Uses information and technology to solve problems</p> <p>E. An integrative and informed thinker who:</p> <p>2. Evaluates and synthesizes information</p>
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	<p>Tech Course to Younger Students/Presenting a Project (optional) AND Oral Demonstration of Skill (optional) SL.1.11-12: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.</p> <p>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.</p> <p>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.</p> <p>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and</p>		<p>from multiple sources</p> <p>3. Applies ideas across disciplines</p> <p>4. Applies systems thinking to understand the interaction and influence of related parts on each other and on outcomes</p>
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	<p>conclusions; and promote divergent and creative perspectives.</p> <p>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.</p>		
<p>5. Gas Metal Arc Welding (GMAW-S, SMAW Spray Transfer)</p>			
<p>a. Perform safety inspections of GMAW equipment and accessories.</p> <p>b. Make minor external repairs to GMAW equipment and accessories.</p> <p>c. Short Circuiting Transfer: Set up for GMAW-S operations on carbon steel.</p> <p>d. Short Circuiting Transfer: Operate GMAW-S equipment on carbon steel.</p> <p>e. Short Circuiting Transfer: Make fillet welds in all positions on carbon steel.</p>	<p>Handout/Textbook/Manual Reading (optional)</p> <p>RST.2.11-12: Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</p> <p>RST.4.11-12: Determine the meaning of symbols, key terms, and other domain specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.</p> <p>DVD Instruction (optional)</p> <p>Possibly SL.3.11-12: Evaluate a</p>	<p>Through this cluster, students might read and understand the central ideas and vocabulary in various texts, listen to /understand DVD instruction, participate in problem solving activities that may require the use of multiple sources, participate in peer teaching/ presentation activities, and verbally present information.</p>	<p>A. A clear and effective communicator who:</p> <ol style="list-style-type: none"> 1. Demonstrates organized and purposeful communication in English and at least one other language (without “one other language.”) 2. Uses evidence and logic appropriately in communication 3. Adjusts communication based on the audience <p>B. A self-directed and lifelong learner who:</p> <ol style="list-style-type: none"> 1. Recognizes the need for information and locates and evaluates

<p>f. Short Circuiting Transfer: Make groove welds in all positions on carbon steel.</p> <p>g. Short Circuiting Transfer: Pass GMAW-S welder performance qualification test on carbon steel.</p> <p>h. Spray Transfer: Set up for GMAW (spray) operations on carbon steel.</p> <p>i. Spray Transfer: Operate GMAW (spray) equipment on carbon steel.</p> <p>j. Spray Transfer: Make fillet welds in the 1F and 2F positions on carbon steel.</p> <p>k. Spray Transfer: Make groove welds in the 1G position on carbon steel.</p> <p>l. Spray Transfer: Pass GMAW (spray) welder performance qualification test on carbon steel.</p>	<p>speaker's point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used.</p> <p>Problem Solving Activity (optional) RST.1.11-12: Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.</p> <p>RST.7.11-12: Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.</p> <p>RST.8.11-12: Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p> <p>Peer Teaching/Introduction of Tech Course to Younger Students/Presenting a Project</p>		<p>resources</p> <p>4. Demonstrates initiative and independence</p> <p>5. Demonstrates flexibility including the ability to learn, unlearn and relearn</p> <p>6. Demonstrates reliability and concern for quality</p> <p>C. Creative and practical problem solver who:</p> <p>1. Observes and evaluates situations to define problems</p> <p>3. Identifies patterns, trends and relationships that apply to solutions</p> <p>4. Generates a variety of solutions, builds a case for a best response and critically evaluates the effectiveness of the response</p> <p>6. Uses information and technology to solve problems</p> <p>E. An integrative and informed thinker who:</p> <p>2. Evaluates and synthesizes information from multiple sources</p> <p>3. Applies ideas across</p>
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	<p>(optional) AND Oral Demonstration of Skill (optional) SL.1.11-12: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.</p> <p>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.</p> <p>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.</p> <p>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.</p>		<p>disciplines</p> <p>4. Applies systems thinking to understand the interaction and influence of related parts on each other and on outcomes</p>
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	<p>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.</p>		
<p>6. Flux Cored Arc Welding (FCAW-G/GM, FCAW-S)</p>			
<p>a. Perform safety inspections of FCAW equipment and accessories.</p> <p>b. Make minor external repairs to FCAW equipment and accessories.</p> <p>c. <i>Gas Shielded:</i> Set up for FCAW-G/GM operations on carbon steel.</p> <p>d. <i>Gas Shielded:</i> Operate FCAW-G/GM equipment on carbon steel.</p> <p>e. <i>Gas Shielded:</i> Make fillet welds in all positions on carbon steel.</p> <p>f. <i>Gas Shielded:</i> Make groove welds in all positions on carbon steel.</p> <p>g. <i>Gas Shielded:</i> Pass FCAW-G/GM welder performance qualification test on carbon steel.</p> <p>h. <i>Self-Shielded:</i> Set up</p>	<p>Handout/Textbook/Manual Reading (optional)</p> <p>RST.2.11-12: Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</p> <p>RST.4.11-12: Determine the meaning of symbols, key terms, and other domain specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.</p> <p>DVD Instruction (optional)</p> <p>Possibly SL.3.11-12: Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice,</p>	<p>Through this cluster, students might read and understand the central ideas and vocabulary in various texts, listen to/understand DVD instruction, participate in problem solving activities that may require the use of multiple sources, participate in peer teaching/presentation activities, and verbally present information.</p>	<p>A. A clear and effective communicator who:</p> <ol style="list-style-type: none"> 1. Demonstrates organized and purposeful communication in English and at least one other language (without “one other language,”) 2. Uses evidence and logic appropriately in communication 3. Adjusts communication based on the audience <p>B. A self-directed and lifelong learner who:</p> <ol style="list-style-type: none"> 1. Recognizes the need for information and locates and evaluates resources 4. Demonstrates initiative and independence 5. Demonstrates flexibility

<p>for FCAW-S operations on carbon steel.</p> <p>i. <i>Self-Shielded: Operate FCAW-S equipment on carbon steel.</i></p> <p>j. <i>Self-Shielded: Make fillet welds in all positions on carbon steel.</i></p> <p>k. <i>Self-Shielded: Make groove welds in all positions on carbon steel.</i></p> <p>l. <i>Self-Shielded: Pass FCAW-S welder performance qualification test on carbon steel.</i></p>	<p>points of emphasis, and tone used.</p> <p>Problem Solving Activity (optional) RST.1.11-12: Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.</p> <p>RST.7.11-12: Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.</p> <p>RST.8.11-12: Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p> <p>Peer Teaching/Introduction of Tech Course to Younger Students/Presenting a Project (optional) AND Oral Demonstration of Skill (optional)</p>		<p>including the ability to learn, unlearn and relearn</p> <p>6. Demonstrates reliability and concern for quality</p> <p>C. Creative and practical problem solver who:</p> <ol style="list-style-type: none"> 1. Observes and evaluates situations to define problems 3. Identifies patterns, trends and relationships that apply to solutions 4. Generates a variety of solutions, builds a case for a best response and critically evaluates the effectiveness of the response 6. Uses information and technology to solve problems <p>E. An integrative and informed thinker who:</p> <ol style="list-style-type: none"> 2. Evaluates and synthesizes information from multiple sources 3. Applies ideas across disciplines 4. Applies systems thinking to understand the interaction and influence
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	<p>SL.1.11-12: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.</p> <p>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.</p> <p>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.</p> <p>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.</p> <p>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve</p>		<p>of related parts on each other and on outcomes</p>
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	<p>contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.</p>		
<p>7. Gas Tungsten Arc Welding (GTAW)</p>			
<p>a. Perform safety inspections of GTAW equipment and accessories.</p> <p>b. Make minor external repairs to GTAW equipment and accessories.</p> <p>c. <i>Carbon Steel:</i> Set up for GTAW operations on carbon steel.</p> <p>d. <i>Carbon Steel:</i> Operate GTAW equipment on carbon steel.</p> <p>e. <i>Carbon Steel:</i> Make fillet welds in all positions on carbon steel.</p> <p>f. <i>Carbon Steel:</i> Make groove welds in all positions on carbon steel.</p> <p>g. <i>Carbon Steel:</i> Pass GTAW welder performance qualification test on carbon steel.</p> <p>h. <i>Austenitic Stainless Steel:</i> Set up for GTAW operations on austenitic stainless steel.</p> <p>i. <i>Austenitic Stainless Steel:</i></p>	<p>Handout/Textbook/Manual Reading (optional) RST.2.11-12: Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</p> <p>RST.4.11-12: Determine the meaning of symbols, key terms, and other domain specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.</p> <p>DVD Instruction (optional) Possibly SL.3.11-12: Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used.</p> <p>Problem Solving Activity</p>	<p>Through this cluster, students might read and understand the central ideas and vocabulary in various texts, listen to/ understand DVD instruction, participate in problem solving activities that may require the use of multiple sources, participate in peer teaching/ presentation activities, and verbally present information.</p>	<p>A. A clear and effective communicator who:</p> <ol style="list-style-type: none"> 1. Demonstrates organized and purposeful communication in English and at least one other language (without “one other language,”) 2. Uses evidence and logic appropriately in communication 3. Adjusts communication based on the audience <p>B. A self-directed and lifelong learner who:</p> <ol style="list-style-type: none"> 1. Recognizes the need for information and locates and evaluates resources 4. Demonstrates initiative and independence 5. Demonstrates flexibility including the ability to learn, unlearn and relearn 6. Demonstrates reliability

<p>Operate GTAW equipment on austenitic stainless steel.</p> <p>j. <i>Austenitic Stainless Steel:</i> Make fillet welds in the 1F, 2F and 3F positions on austenitic stainless steel.</p> <p>k. <i>Austenitic Stainless Steel:</i> Make groove welds in the 1G and 2G positions on austenitic stainless steel.</p> <p>l. <i>Austenitic Stainless Steel:</i> Pass GTAW welder performance qualification test on austenitic stainless steel.</p> <p>m. <i>Aluminum:</i> Set up for GTAW operations on aluminum.</p> <p>n. <i>Aluminum:</i> Operate GTAW equipment on aluminum.</p> <p>o. <i>Aluminum:</i> Make fillet welds in the 1F and 2F positions on aluminum.</p> <p>p. <i>Aluminum:</i> Make groove welds in the 1G position on aluminum.</p> <p>q. <i>Aluminum:</i> Pass GTAW welder performance qualification test on aluminum.</p>	<p>(optional) RST.1.11-12: Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or inconsistencies in the account.</p> <p>RST.7.11-12: Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.</p> <p>RST.8.11-12: Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p> <p>Peer Teaching/Introduction of Tech Course to Younger Students/Presenting a Project (optional) AND Oral Demonstration of Skill (optional) SL.1.11-12: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups,</p>		<p>and concern for quality</p> <p>C. Creative and practical problem solver who:</p> <ol style="list-style-type: none"> 1. Observes and evaluates situations to define problems 3. Identifies patterns, trends and relationships that apply to solutions 4. Generates a variety of solutions, builds a case for a best response and critically evaluates the effectiveness of the response 6. Uses information and technology to solve problems <p>E. An integrative and informed thinker who:</p> <ol style="list-style-type: none"> 2. Evaluates and synthesizes information from multiple sources 3. Applies ideas across disciplines 4. Applies systems thinking to understand the interaction and influence of related parts on each other and on outcomes
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	<p>and teacher-led) with diverse partners on grades 11-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.</p> <p>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.</p> <p>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.</p> <p>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.</p> <p>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the</p>		
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	investigation or complete the task.		
8. Thermal Cutting Processes			
<p>a. <i>Manual Oxyfuel Cutting (OFC)</i>: Perform safety inspections of manual OFC equipment and accessories.</p> <p>b. <i>Manual Oxyfuel Cutting (OFC)</i>: Make minor external repairs to manual OFC equipment and accessories.</p> <p>c. <i>Manual Oxyfuel Cutting (OFC)</i>: Set up for manual OFC operations on carbon steel.</p> <p>d. <i>Manual Oxyfuel Cutting (OFC)</i>: Operate manual OFC equipment on carbon steel.</p> <p>e. <i>Manual Oxyfuel Cutting (OFC)</i>: Perform straight, square edge cutting operations in the flat and horizontal positions on carbon steel.</p> <p>f. <i>Manual Oxyfuel Cutting (OFC)</i>: Perform shape, square edge cutting operations in the flat and horizontal positions on carbon steel.</p> <p>g. <i>Manual Oxyfuel Cutting (OFC)</i>: Perform straight,</p>	<p>Handout/Textbook/Manual Reading (optional) RST.2.11-12: Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</p> <p>RST.4.11-12: Determine the meaning of symbols, key terms, and other domain specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.</p> <p>DVD Instruction (optional) Possibly SL.3.11-12: Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used.</p> <p>Problem Solving Activity (optional) RST.1.11-12: Cite specific textual evidence to support analysis of science and technical texts,</p>	<p>Through this cluster, students might read and understand the central ideas and vocabulary in various texts, listen to/understand DVD instruction, participate in problem solving activities that may require the use of multiple sources, participate in peer teaching/presentation activities, and verbally present information.</p>	<p>A. A clear and effective communicator who:</p> <ol style="list-style-type: none"> 1. Demonstrates organized and purposeful communication in English and at least one other language (without “one other language,”)) 2. Uses evidence and logic appropriately in communication 3. Adjusts communication based on the audience <p>B. A self-directed and lifelong learner who:</p> <ol style="list-style-type: none"> 1. Recognizes the need for information and locates and evaluates resources 4. Demonstrates initiative and independence 5. Demonstrates flexibility including the ability to learn, unlearn and relearn 6. Demonstrates reliability and concern for quality <p>C. Creative and practical problem solver who:</p>

<p>bevel edge cutting operations in the flat and horizontal positions on carbon steel.</p> <p>h. <i>Manual Oxyfuel Cutting (OFC)</i>: Perform scarfing and gouging operations to remove base and weld metal, in the flat and horizontal positions on carbon steel.</p> <p>i. <i>Mechanized Oxyfuel Cutting (OFC) (e.g., Track Burner)</i>: Perform safety inspections of mechanized OFC equipment and accessories.</p> <p>j. <i>Mechanized Oxyfuel Cutting</i>: Make minor external repairs to mechanized OFC equipment and accessories.</p> <p>k. <i>Mechanized Oxyfuel Cutting</i>: Set up for mechanized OFC operations on carbon steel.</p> <p>l. <i>Mechanized Oxyfuel Cutting</i>: Operate mechanized OFC equipment on carbon steel.</p> <p>m. <i>Mechanized Oxyfuel Cutting</i>: Perform straight, square edge cutting</p>	<p>attending to important distinctions the author makes and to any gaps or inconsistencies in the account.</p> <p>RST.7.11-12: Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.</p> <p>RST.8.11-12: Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p> <p>Peer Teaching/Introduction of Tech Course to Younger Students/Presenting a Project (optional) AND Oral Demonstration of Skill (optional)</p> <p>SL.1.11-12: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11-12 topics, texts, and issues, building on others' ideas and expressing their own</p>		<p>1. Observes and evaluates situations to define problems</p> <p>3. Identifies patterns, trends and relationships that apply to solutions</p> <p>4. Generates a variety of solutions, builds a case for a best response and critically evaluates the effectiveness of the response</p> <p>6. Uses information and technology to solve problems</p> <p>E. An integrative and informed thinker who:</p> <p>2. Evaluates and synthesizes information from multiple sources</p> <p>3. Applies ideas across disciplines</p> <p>4. Applies systems thinking to understand the interaction and influence of related parts on each other and on outcomes</p>
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<p>operations in the flat position on carbon steel.</p> <p>n. <i>Mechanized Oxyfuel Cutting</i>: Perform straight, bevel edge cutting operations in the flat position on carbon steel.</p> <p>o. <i>Manual Plasma Arc Cutting (PAC)</i>: Perform safety inspections of manual PAC equipment and accessories.</p> <p>p. <i>Manual Plasma Arc Cutting</i>: Make minor external repairs to manual PAC equipment and accessories.</p> <p>q. <i>Manual Plasma Arc Cutting</i>: Set up for manual PAC operations on carbon steel, austenitic stainless steel and aluminum.</p> <p>r. <i>Manual Plasma Arc Cutting</i>: Operate manual PAC equipment on carbon steel, austenitic stainless steel, and aluminum.</p> <p>s. <i>Manual Plasma Arc Cutting</i>: Perform straight, square edge cutting operations in the flat and horizontal positions on carbon steel, austenitic stainless steel and aluminum.</p> <p>t. <i>Manual Plasma Arc Cutting</i>:</p>	<p>clearly and persuasively.</p> <p>a. Come to discussions prepared, having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.</p> <p>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.</p> <p>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.</p> <p>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.</p>		
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<p>Perform shape, square edge cutting operations in the flat and horizontal positions on carbon steel, austenitic stainless steel and aluminum.</p> <p>u. <i>Manual Air Carbon Arc Cutting (CAC-A)</i>: Perform safety inspections of manual CAC-A equipment and accessories.</p> <p>v. <i>Manual Air Carbon Arc Cutting</i>: Make minor external repairs to manual CAC-A equipment and accessories.</p> <p>w. <i>Manual Air Carbon Arc Cutting</i>: Set up for manual CAC-A scarfing and gouging operations on carbon steel.</p> <p>x. <i>Manual Air Carbon Arc Cutting</i>: Operate manual CAC-A equipment on carbon steel.</p> <p>y. <i>Manual Air Carbon Arc Cutting</i>: Perform scarfing and gouging operations to remove base and weld metal in the flat and horizontal positions on carbon steel.</p>			
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9. Welding Inspection and Testing			
<p>a. Examine cut surfaces and edges of prepared base metal parts.</p> <p>b. Examine tacks, root passes, intermediate layers and completed welds.</p>	<p>Handout/Textbook/Manual Reading (optional) RST.2.11-12: Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.</p> <p>RST.4.11-12: Determine the meaning of symbols, key terms, and other domain specific words and phrases as they are used in a specific scientific or technical context relevant to grades 11–12 texts and topics.</p> <p>DVD Instruction (optional) Possibly SL.3.11-12: Evaluate a speaker’s point of view, reasoning, and use of evidence and rhetoric, assessing the stance, premises, links among ideas, word choice, points of emphasis, and tone used.</p> <p>Problem Solving Activity (optional) RST.1.11-12: Cite specific textual evidence to support analysis of science and technical texts, attending to important distinctions the author makes and to any gaps or</p>	<p>Through this cluster, students might read and understand the central ideas and vocabulary in various texts, listen to/understand DVD instruction, participate in problem solving activities that may require the use of multiple sources, participate in peer teaching/presentation activities, and verbally present information.</p>	<p>A. A clear and effective communicator who:</p> <ol style="list-style-type: none"> 1. Demonstrates organized and purposeful communication in English and at least one other language (without “one other language,”) 2. Uses evidence and logic appropriately in communication 3. Adjusts communication based on the audience <p>B. A self-directed and lifelong learner who:</p> <ol style="list-style-type: none"> 1. Recognizes the need for information and locates and evaluates resources 4. Demonstrates initiative and independence 5. Demonstrates flexibility including the ability to learn, unlearn and relearn 6. Demonstrates reliability and concern for quality <p>C. Creative and practical problem solver who:</p> <ol style="list-style-type: none"> 1. Observes and evaluates situations to

	<p>inconsistencies in the account.</p> <p>RST.7.11-12: Integrate and evaluate multiple sources of information presented in diverse formats and media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.</p> <p>RST.8.11-12: Evaluate the hypotheses, data, analysis, and conclusions in a science or technical text, verifying the data when possible and corroborating or challenging conclusions with other sources of information.</p> <p>Peer Teaching/Introduction of Tech Course to Younger Students/Presenting a Project (optional) AND Oral Demonstration of Skill (optional)</p> <p>SL.1.11-12: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grades 11-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.</p> <p>a. Come to discussions prepared,</p>		<p>define problems</p> <p>3. Identifies patterns, trends and relationships that apply to solutions</p> <p>4. Generates a variety of solutions, builds a case for a best response and critically evaluates the effectiveness of the response</p> <p>6. Uses information and technology to solve problems</p> <p>E. An integrative and informed thinker who:</p> <p>2. Evaluates and synthesizes information from multiple sources</p> <p>3. Applies ideas across disciplines</p> <p>4. Applies systems thinking to understand the interaction and influence of related parts on each other and on outcomes</p>
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	<p>having read and researched material under study; explicitly draw on that preparation by referring to evidence from texts and other research on the topic or issue to stimulate a thoughtful, well-reasoned exchange of ideas.</p> <p>b. Work with peers to promote civil, democratic discussions and decision-making, set clear goals and deadlines, and establish individual roles as needed.</p> <p>c. Propel conversations by posing and responding to questions that probe reasoning and evidence; ensure a hearing for a full range of positions on a topic or issue; clarify, verify, or challenge ideas and conclusions; and promote divergent and creative perspectives.</p> <p>d. Respond thoughtfully to diverse perspectives; synthesize comments, claims, and evidence made on all sides of an issue; resolve contradictions when possible; and determine what additional information or research is required to deepen the investigation or complete the task.</p>		
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