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

	Welder: Duties, Skills, and Tasks	English Language Arts- Reading, Writing, Speaking and Listening (CCSS)	Demonstration of Proficiency (Possible Evidence, Project, Performance Assessment, Certification etc.)	Maine Learning Results- Guiding Principles, and Career and Education Development
1.	Occupational Orientation			
a. b. c. d.	Prepare time or job cards, reports or records. Perform house keeping duties. Follow verbal instructions to complete work assignments. Follow written instructions to complete work assignments.	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. 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. 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	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.	 A. A clear and effective communicator who: 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 B. A self-directed and lifelong learner who: 1. Recognizes the need for information and locates and evaluates resources 4. Demonstrates initiative and independence

limitations of each source in terms of	E. An integrative and
the specific task, purpose, and	informed thinker who:
audience; integrate information into	2. Evaluates and
the text selectively to maintain the	synthesizes information
flow of ideas, avoiding plagiarism	from multiple sources
and overreliance on any one source	3. Applies ideas across
and following a standard format for	disciplines
citation.	
(This is certainly gathering "relevant	
information" from "multiple	
authoritativesources," though it	
isn't "using advanced searches	
effectively."	
Portfolio of Work Samples/	
Summaries of Welds and	
Procedures (optional)	
WHST.4.11-12: Produce clear and	
coherent writing in which the	
development, organization, and style	
are appropriate to task, purpose,	
and audience.	
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.	

Peer Teaching/Introduction of	
Tech Course to Younger	
Students/Presenting a Project	
(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.	
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.	
b. Work with peers to promote civil,	
democratic discussions and	
decision-making, set clear goals and	
deadlines, and establish individual	
roles as needed.	
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.	

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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.		
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.		
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.		
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.		

	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.		
2. Safety and Health of Welder	s		
a. Demonstrate proper	Peer Teaching/Introduction of	Through this cluster, students	A. A clear and effective
use and inspection of Personal	Tech Course to Younger	might participate in peer	communicator who:
Protection Equipment (PPE).	Students/Presenting a Project	teaching activities/reteach	1. Demonstrates
b. Demonstrate proper	(optional)	OSHA 10-hour, read and	organized and purposeful
safe operation practices in the	SL.1.11-12: Initiate and participate	understand the central ideas	communication in English
work area.	effectively in a range of collaborative	and vocabulary in various	and at least one other
c. Demonstrate proper	discussions (one-on-one, in groups,	texts, listen to/understand	language (without "one
use and inspection of	and teacher-led) with diverse	DVD instruction, participate in	other language,")
ventilation equipment.	partners on grades 11-12 topics,	problem solving activities that	2. Uses evidence and
d. Demonstrate proper Hot	texts, and issues, building on others'	may require the use of multiple	logic appropriately in
Zone operation.	ideas and expressing their own	sources, and verbally present	communication
e. Demonstrate proper	clearly and persuasively.	information.	3. Adjusts communication
work actions for working in	a. Come to discussions prepared,		based on the audience
confined spaces.	having read and researched material		
f. Demonstrate proper	under study; explicitly draw on that		B. A self-directed and
use of precautionary labeling	preparation by referring to evidence		lifelong learner who:
and MSDS information.	from texts and other research on the		1. Recognizes the need
g. Demonstrate proper	topic or issue to stimulate a		for information and
inspection and operation of	thoughtful, well-reasoned exchange		locates and evaluates
equipment used for each	of ideas.		resources
required welding and thermal	b. Work with peers to promote civil,		4. Demonstrates initiative
cutting process (This is best	democratic discussions and		and independence
done as a part of the process	decision-making, set clear goals and		

module/unit for each of the	deadlines, and establish individual	C. Creative and practical
required welding and thermal	roles as needed.	problem solver who:
cutting processes).	c. Propel conversations by posing	1. Observes and
	and responding to questions that	evaluates situations to
	probe reasoning and evidence;	define problems.
	ensure a hearing for a full range of	D. A responsible and
	positions on a topic or issue; clarify,	involved citizen who:
	verify, or challenge ideas and	2. Accepts responsibility
	conclusions; and promote divergent	for personal decisions and
	and creative perspectives.	actions
	d. Respond thoughtfully to diverse	
	perspectives; synthesize comments,	E. An integrative and
	claims, and evidence made on all	informed thinker who:
	sides of an issue; resolve	2. Evaluates and
	contradictions when possible; and	synthesizes information
	determine what additional	from multiple sources
	information or research is required to	3. Applies ideas across
	deepen the investigation or complete	disciplines
	the task.	
	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.	
	RST.4.11-12: Determine the	
	meaning of symbols, key terms, and	
	other domain specific words and	
	phrases as they are used in a	

5	specific scientific or technical context	
l r	relevant to grades 11–12 texts and	
l t	topics	
	1	
	DVD Instruction (optional)	
	Possibly SL 3 11-12: Evaluate a	
	apackor's point of view reasoning	
	speaker's point of view, reasoning,	
ć	and use of evidence and metoric,	
ĺ	assessing the stance, premises,	
	links among ideas, word choice,	
1	points of emphasis, and tone used.	
	Problem Solving Activity	
	(optional)	
F	RST.1.11-12: Cite specific textual	
e	evidence to support analysis of	
s	science and technical texts,	
	attending to important distinctions	
1	the author makes and to any gaps or	
i	inconsistencies in the account	
	PST 7 11 12: Integrate and evaluate	
	multiple sources of information	
ľ	multiple sources of information	
l l	presented in diverse formats and	
ľ	media (e.g., quantitative data, video,	
l r	multimedia) in order to address a	
	question or solve a problem.	
	RST.8.11-12: Evaluate the	
	hypotheses, data, analysis, and	
	conclusions in a science or technical	
l t	text, verifying the data when	
	possible and corroborating or	

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sources of information.	
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.	
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.	
b. Work with peers to promote civil,	
democratic discussions and	
decision-making, set clear goals and	
deadlines, and establish individual	
roles as needed.	
c. Propel conversations by posing	
and responding to questions that	
probe reasoning and evidence.	
ensure a bearing for a full range of	
positions on a topic or issue: clarify	
positions on a topic of issue, clarity,	

	 verify, or challenge ideas and conclusions; and promote divergent and creative perspectives. 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. 		
3. Drawing and Welding Symbol	ol Interpretation		
a. Interpret basic elements	Handout/Textbook/Manual	Through this cluster, students	A. A clear and effective
of a drawing or sketch.	Reading (optional)	might read and understand the	communicator who:
b. Interpret welding	RST.2.11-12: Determine the central	central ideas and vocabulary	1. Demonstrates
symbols information.	ideas or conclusions of a text;	in various texts, listen to/	organized and purposeful
c. Fabricate parts from a	summarize complex concepts,	understand DVD instruction,	communication in English
drawing or sketch.	processes, or information presented	participate in problem solving	and at least one other
	in a text by paraphrasing them in	activities that may require the	language (without "one
	simpler but still accurate terms.	use of multiple sources, and	other language,")
		verbally present information.	2. Uses evidence and
	RST.4.11-12: Determine the		logic appropriately in
	meaning of symbols, key terms, and		communication
	other domain specific words and		3. Adjusts communication
	phrases as they are used in a		based on the audience
	specific scientific or technical context		
	relevant to grades 11–12 texts and		B. A self-directed and
	topics.		lifelong learner who:
			3. Applies knowledge in

DVD Instruction (optional)	new contexts
Possibly SL.3.11-12: Evaluate a	
speaker's point of view, reasoning,	C. Creative and practical
and use of evidence and rhetoric,	problem solver.
assessing the stance, premises,	
links among ideas, word choice,	E. An integrative and
points of emphasis, and tone used.	informed thinker who:
	2. Evaluates and
RST.4.11-12: Determine the	synthesizes information
meaning of symbols, key terms, and	from multiple sources
other domain specific words and	3. Applies ideas across
phrases as they are used in a	disciplines
specific scientific or technical context	
relevant to grades 11–12 texts and	
topics.	
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.	
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.	
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.	
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.	
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.	
b. Work with peers to promote civil,	
democratic discussions and	
decision-making, set clear goals and	
deadlines, and establish individual	
roles as needed.	
c. Propel conversations by posing	
and responding to questions that	
probe reasoning and evidence;	

	ensure a hearing for a full range of		
	nositions on a tonic or issue: clarify		
	verify or challenge ideas and		
	conclusions, and promote divergent		
	conclusions, and promote divergent		
	and creative perspectives.		
	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.		
4. Shielded Metal Arc Welding	(SMAW)		
a. Perform safety	Handout/Textbook/Manual	Through this cluster, students	A. A clear and effective
inspections of SMAW	Reading (optional)	might read and understand the	communicator who:
equipment and accessories.	RST.2.11-12: Determine the central	central ideas and vocabulary	1. Demonstrates
b. Make minor external	ideas or conclusions of a text;	in various texts, listen	organized and purposeful
repairs to SMAW equipment	summarize complex concepts,	to/understand DVD instruction,	communication in English
and accessories.	processes, or information presented	participate in problem solving	and at least one other
c. Set up for SMAW	in a text by paraphrasing them in	activities that may require the	language (without "one
operations on carbon steel.	simpler but still accurate terms.	use of multiple sources,	other language,")
d. Operate SMAW		participate in peer	2. Uses evidence and
equipment on carbon steel.	RST.4.11-12: Determine the	teaching/presentation	logic appropriately in
e. Make fillet welds in all	meaning of symbols, key terms, and	activities, and verbally present	communication
positions on carbon steel.	other domain specific words and	information.	3. Adjusts communication
f. Make groove welds in	phrases as they are used in a		based on the audience
all positions on carbon steel.	specific scientific or technical context		
g. Pass SMAW welder	relevant to grades 11–12 texts and		B. A self-directed and
performance gualification test	topics.		lifelong learner who:
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thickness test plates) on	DVD Instruction (optional)	for information and
carbon steel.	Possibly SL.3.11-12: Evaluate a	locates and evaluates
	speaker's point of view, reasoning,	resources
	and use of evidence and rhetoric,	4. Demonstrates initiative
	assessing the stance, premises,	and independence
	links among ideas, word choice,	5. Demonstrates flexibility
	points of emphasis, and tone used.	including the ability to
		learn, unlearn and relearn
	Problem Solving Activity	6. Demonstrates reliability
	(optional)	and concern for quality
	RST.1.11-12: Cite specific textual	
	evidence to support analysis of	C. Creative and practical
	science and technical texts,	problem solver who:
	attending to important distinctions	1. Observes and
	the author makes and to any gaps or	evaluates situations to
	inconsistencies in the account.	define problems
		3. Identifies patterns,
	RST.7.11-12: Integrate and evaluate	trends and relationships
	multiple sources of information	that apply to solutions
	presented in diverse formats and	4. Generates a variety of
	media (e.g., quantitative data, video,	solutions, builds a case
	multimedia) in order to address a	for a best response and
	question or solve a problem.	critically evaluates the
		effectiveness of the
	RST.8.11-12: Evaluate the	response
	hypotheses, data, analysis, and	6. Uses information and
	conclusions in a science or technical	technology to solve
	text, verifying the data when	problems
	possible and corroborating or	
	challenging conclusions with other	E. An integrative and
	sources of information.	informed thinker who:
		2. Evaluates and
	Peer Teaching/Introduction of	synthesizes information

Tech Course to Younger	from multiple sources
Students/Presenting a Project	3. Applies ideas across
(optional)	disciplines
AND	4. Applies systems
Oral Demonstration of Skill	thinking to understand the
(optional)	interaction and influence
SL.1.11-12: Initiate and participate	of related parts on each
effectively in a range of collaborative	other and on outcomes
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.	
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.	
b. Work with peers to promote civil,	
democratic discussions and	
decision-making, set clear goals and	
deadlines, and establish individual	
roles as needed.	
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.		
	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.		
5. Gas Metal Arc Welding (GMAW-S, SMAW Spray Transfer)		
a. Perform safety inspectio	ns Handout/Textbook/Manual	Through this cluster, students	A. A clear and effective
of GMAW equipment and	Reading (optional)	might read and understand the	communicator who:
accessories.	RST.2.11-12: Determine the central	central ideas and vocabulary	1. Demonstrates
	ideas or conclusions of a text;	in various texts, listen to	organized and purposeful
b. Make minor external rep	airs summarize complex concepts,	/understand DVD instruction,	communication in English
to GMAW equipment and	processes, or information presented	participate in problem solving	and at least one other
accessories.	in a text by paraphrasing them in	activities that may require the	language (without "one
c Short Circuiting Transfer	simpler but still accurate terms.	use of multiple sources,	other language,")
Set up for GMAW-S		participate in peer teaching/	2. Uses evidence and
operations on carbon ste	RST.4.11-12: Determine the	presentation activities, and	logic appropriately in
	meaning of symbols, key terms, and	verbally present information.	communication
d. Short Circuiting Transfer	other domain specific words and		3. Adjusts communication
Operate GMAW-S	phrases as they are used in a		based on the audience
equipment on carbon ste	el. specific scientific or technical context		
	relevant to grades 11–12 texts and		B. A self-directed and
e. Short Circuiting Transfer	topics.		lifelong learner who:
Make fillet welds in all			1. Recognizes the need
positions on carbon stee	DVD Instruction (optional)		for information and
	Possibly SL.3.11-12: Evaluate a		locates and evaluates

f.	Short Circuiting Transfer:	speaker's point of view, reasoning,	resources
	Make groove welds in all	and use of evidence and rhetoric,	4. Demonstrates initiative
	positions on carbon steel.	assessing the stance, premises,	and independence
		links among ideas, word choice,	5. Demonstrates flexibility
g.	Short Circuiting Transfer:	points of emphasis, and tone used.	including the ability to
	Pass GMAW-S welder		learn, unlearn and relearn
	performance qualification	Problem Solving Activity	6. Demonstrates reliability
	test on carbon steel.	(optional)	and concern for quality
h	Spray Transfer: Set up for	RST.1.11-12: Cite specific textual	
	GMAW (spray) operations	evidence to support analysis of	C. Creative and practical
	on carbon steel	science and technical texts,	problem solver who:
		attending to important distinctions	1. Observes and
i.	Spray Transfer: Operate	the author makes and to any gaps or	evaluates situations to
	GMAW (spray) equipment	inconsistencies in the account.	define problems
	on carbon steel.		3. Identifies patterns,
		RST.7.11-12: Integrate and evaluate	trends and relationships
J.	Spray Transfer: Make fillet	multiple sources of information	that apply to solutions
	welds in the 1F and 2F	presented in diverse formats and	4. Generates a variety of
	positions on carbon steel.	media (e.g., quantitative data, video,	solutions, builds a case
k.	Sprav Transfer: Make	multimedia) in order to address a	for a best response and
	groove welds in the 1G	question or solve a problem.	critically evaluates the
	position on carbon steel.		effectiveness of the
		RST.8.11-12: Evaluate the	response
١.	Spray Transfer: Pass	hypotheses, data, analysis, and	6. Uses information and
	GMAW (spray) welder	conclusions in a science or technical	technology to solve
	performance qualification	text, verifying the data when	problems
	test on carbon steel.	possible and corroborating or	
		challenging conclusions with other	E. An integrative and
		sources of information.	informed thinker who:
			2. Evaluates and
		Peer leaching/introduction of	synthesizes information
		Tech Course to Younger	trom multiple sources
		Students/Presenting a Project	3. Applies ideas across

(optional)	disciplines
AND	4. Applies systems
Oral Demonstration of Skill	thinking to understand the
(optional)	interaction and influence
SL.1.11-12: Initiate and participate	of related parts on each
effectively in a range of collaborative	other and on outcomes
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.	
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.	
b. Work with peers to promote civil,	
democratic discussions and	
decision-making, set clear goals and	
deadlines, and establish individual	
roles as needed.	
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.	

	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.		
6. Flux Cored Arc Welding (FC	AW-G/GM, FCAW-S)		
a. Perform safety	Handout/Textbook/Manual	Through this cluster, students	A. A clear and effective
inspections of FCAW	Reading (optional)	might read and understand the	communicator who:
equipment and accessories.	RST.2.11-12: Determine the central	central ideas and vocabulary	1. Demonstrates
b. Make minor external	ideas or conclusions of a text;	in various texts, listen	organized and purposeful
repairs to FCAW equipment	summarize complex concepts,	to/understand DVD instruction,	communication in English
and accessories.	processes, or information presented	participate in problem solving	and at least one other
c. Gas Shielded: Set up	in a text by paraphrasing them in	activities that may require the	language (without "one
for FCAW-G/GM operations on	simpler but still accurate terms.	use of multiple sources,	other language,")
carbon steel.		participate in peer	2. Uses evidence and
d. Gas Shielded: Operate	RST.4.11-12: Determine the	teaching/presentation	logic appropriately in
FCAW-G/GM equipment on	meaning of symbols, key terms, and	activities, and verbally present	communication
carbon steel.	other domain specific words and	information.	3. Adjusts communication
e. Gas Shielded: Make	phrases as they are used in a		based on the audience
fillet welds in all positions on	specific scientific or technical context		
carbon steel.	relevant to grades 11–12 texts and		B. A self-directed and
f. Gas Shielded: Make	topics.		lifelong learner who:
groove welds in all positions on			1. Recognizes the need
carbon steel.	DVD Instruction (optional)		for information and
g. Gas Shielded: Pass	Possibly SL.3.11-12: Evaluate a		locates and evaluates
FCAW-G/GM welder	speaker's point of view, reasoning,		resources
performance qualification test	and use of evidence and rhetoric,		4. Demonstrates initiative
<i>on</i> carbon steel.	assessing the stance, premises,		and independence
h. Self-Shielded: Set up	links among ideas, word choice,		5. Demonstrates flexibility

for FCAW-S operations on	points of emphasis, and tone used.	including the ability to
carbon steel.		learn, unlearn and relearn
i. Self-Shielded: Operate	Problem Solving Activity	6. Demonstrates reliability
FCAW-S equipment on carbon	(optional)	and concern for quality
steel.	RST.1.11-12: Cite specific textual	
j. Self-Shielded: Make	evidence to support analysis of	C. Creative and practical
fillet welds in all positions on	science and technical texts,	problem solver who:
carbon steel.	attending to important distinctions	1. Observes and
k. Self-Shielded: Make	the author makes and to any gaps or	evaluates situations to
groove welds in all positions on	inconsistencies in the account.	define problems
carbon steel.		3. Identifies patterns,
I. Self-Shielded: Pass	RST.7.11-12: Integrate and evaluate	trends and relationships
FCAW-S welder performance	multiple sources of information	that apply to solutions
qualification test on carbon	presented in diverse formats and	4. Generates a variety of
steel.	media (e.g., quantitative data, video,	solutions, builds a case
	multimedia) in order to address a	for a best response and
	question or solve a problem.	critically evaluates the
		effectiveness of the
	RST.8.11-12: Evaluate the	response
	hypotheses, data, analysis, and	6. Uses information and
	conclusions in a science or technical	technology to solve
	text, verifying the data when	problems
	possible and corroborating or	
	challenging conclusions with other	E. An integrative and
	sources of information.	informed thinker who:
		2. Evaluates and
	Peer Teaching/Introduction of	synthesizes information
	Tech Course to Younger	from multiple sources
	Students/Presenting a Project	3. Applies ideas across
	(optional)	disciplines
	AND	4. Applies systems
	Oral Demonstration of Skill	thinking to understand the
	(optional)	interaction and influence

SL.1.11-12: Initiate and participate	of related parts on each
effectively in a range of collaborative	other and on outcomes
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.	
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.	
b. Work with peers to promote civil,	
democratic discussions and	
decision-making, set clear goals and	
deadlines, and establish individual	
roles as needed.	
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.	
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.		
7.	Gas Tungsten Arc Welding (GTAW)		
a.	Perform safety inspections	Handout/Textbook/Manual	Through this cluster, students	A. A clear and effective
	of GTAW equipment and	Reading (optional)	might read and understand the	communicator who:
	accessories.	RST.2.11-12: Determine the central	central ideas and vocabulary	1. Demonstrates
b.	Make minor external repairs	ideas or conclusions of a text;	in various texts, listen to/	organized and purposeful
	to GTAW equipment and	summarize complex concepts,	understand DVD instruction,	communication in English
	accessories.	processes, or information presented	participate in problem solving	and at least one other
C.	Carbon Steel: Set up for	in a text by paraphrasing them in	activities that may require the	language (without "one
	GTAW operations on	simpler but still accurate terms.	use of multiple sources,	other language,")
	carbon steel.		participate in peer teaching/	2. Uses evidence and
d.	Carbon Steel: Operate	RST.4.11-12: Determine the	presentation activities, and	logic appropriately in
	GTAW equipment on	meaning of symbols, key terms, and	verbally present information.	communication
	carbon steel.	other domain specific words and		3. Adjusts communication
e.	Carbon Steel: Make fillet	phrases as they are used in a		based on the audience
	welds in all positions on	specific scientific or technical context		
	carbon steel.	relevant to grades 11–12 texts and		B. A self-directed and
f.	Carbon Steel: Make groove	topics.		lifelong learner who:
	welds in all positions on			1. Recognizes the need
	carbon steel.	DVD Instruction (optional)		for information and
g.	Carbon Steel: Pass GTAW	Possibly SL.3.11-12: Evaluate a		locates and evaluates
	welder performance	speaker's point of view, reasoning,		resources
	qualification test on carbon	and use of evidence and rhetoric,		4. Demonstrates initiative
	steel.	assessing the stance, premises,		and independence
h.	Austenitic Stainless Steel:	links among ideas, word choice,		5. Demonstrates flexibility
	Set up for GTAW operations	points of emphasis, and tone used.		including the ability to
	on austenitic stainless steel.			learn, unlearn and relearn
i.	Austenitic Stainless Steel:	Problem Solving Activity		6. Demonstrates reliability

	Operate GTAW equipment	(optional)	and concern for quality
	on austenitic stainless steel.	RST.1.11-12: Cite specific textual	
j.	Austenitic Stainless Steel:	evidence to support analysis of	C. Creative and practical
	Make fillet welds in the 1F,	science and technical texts,	problem solver who:
	2F and 3F positions on	attending to important distinctions	1. Observes and
	austenitic stainless steel.	the author makes and to any gaps or	evaluates situations to
k.	Austenitic Stainless Steel:	inconsistencies in the account.	define problems
	Make groove welds in the		3. Identifies patterns,
	1G and 2G positions on	RST.7.11-12: Integrate and evaluate	trends and relationships
	austenitic stainless steel.	multiple sources of information	that apply to solutions
Т.	Austenitic Stainless Steel:	presented in diverse formats and	4. Generates a variety of
	Pass GTAW welder	media (e.g., quantitative data, video,	solutions, builds a case
	performance qualification	multimedia) in order to address a	for a best response and
	test on austenitic stainless	question or solve a problem.	critically evaluates the
	steel.		effectiveness of the
m.	Aluminum: Set up for	RST.8.11-12: Evaluate the	response
	GTAW operations on	hypotheses, data, analysis, and	6. Uses information and
	aluminum.	conclusions in a science or technical	technology to solve
n.	Aluminum: Operate GTAW	text, verifying the data when	problems
	equipment on aluminum.	possible and corroborating or	
о.	Aluminum: Make fillet welds	challenging conclusions with other	E. An integrative and
	in the 1Fand 2F positions	sources of information.	informed thinker who:
	on aluminum.		2. Evaluates and
р.	Aluminum: Make groove	Peer Teaching/Introduction of	synthesizes information
	welds in the 1G position on	Tech Course to Younger	from multiple sources
	aluminum.	Students/Presenting a Project	3. Applies ideas across
q.	Aluminum: Pass GTAW	(optional)	disciplines
	welder performance	AND	4. Applies systems
	qualification test on	Oral Demonstration of Skill	thinking to understand the
	aluminum.	(optional)	interaction and influence
		SL.1.11-12: Initiate and participate	of related parts on each
		effectively in a range of collaborative	other and on outcomes
		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.	
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.	
b. Work with peers to promote civil,	
democratic discussions and	
decision-making, set clear goals and	
deadlines, and establish individual	
roles as needed.	
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.	
d. Respond thoughtfully to diverse	
perspectives; synthesize comments,	
claims, and evidence made on all	
sides of an issue; resolve contra-	
dictions when possible; and deter-	
mine what additional information or	
research is required to deepen the	

		investigation or complete the task.		
8.	Thermal Cutting Processes			
а.	Manual Oxyfuel Cutting	Handout/Textbook/Manual	Through this cluster, students	A. A clear and effective
	(OFC): Perform safety	Reading (optional)	might read and understand the	communicator who:
	inspections of manual OFC	RST.2.11-12: Determine the central	central ideas and vocabulary	1. Demonstrates
	equipment and accessories.	ideas or conclusions of a text;	in various texts, listen	organized and purposeful
b.	Manual Oxyfuel Cutting	summarize complex concepts,	to/understand DVD instruction,	communication in English
	(OFC): Make minor external	processes, or information presented	participate in problem solving	and at least one other
	repairs to manual OFC	in a text by paraphrasing them in	activities that may require the	language (without "one
	equipment and accessories.	simpler but still accurate terms.	use of multiple sources,	other language,")
с.	Manual Oxyfuel Cutting		participate in peer	2. Uses evidence and
	(OFC): Set up for manual	RST.4.11-12: Determine the	teaching/presentation	logic appropriately in
	OFC operations on carbon	meaning of symbols, key terms, and	activities, and verbally present	communication
	steel.	other domain specific words and	information.	3. Adjusts communication
d.	Manual Oxyfuel Cutting	phrases as they are used in a		based on the audience
	(OFC): Operate manual	specific scientific or technical context		
	OFC equipment on carbon	relevant to grades 11–12 texts and		B. A self-directed and
	steel.	topics.		lifelong learner who:
е.	Manual Oxyfuel Cutting			1. Recognizes the need
	(OFC): Perform straight,	DVD Instruction (optional)		for information and
	square edge cutting	Possibly SL.3.11-12: Evaluate a		locates and evaluates
	operations in the flat and	speaker's point of view, reasoning,		resources
	horizontal positions on	and use of evidence and rhetoric,		4. Demonstrates initiative
	carbon steel.	assessing the stance, premises,		and independence
f.	Manual Oxyfuel Cutting	links among ideas, word choice,		5. Demonstrates flexibility
	(OFC): Perform shape,	points of emphasis, and tone used.		including the ability to
	square edge cutting			learn, unlearn and relearn
	operations in the flat and	Problem Solving Activity		6. Demonstrates reliability
	horizontal positions on	(optional)		and concern for quality
	carbon steel.	RST.1.11-12: Cite specific textual		
g.	Manual Oxyfuel Cutting	evidence to support analysis of		C. Creative and practical
	(OFC): Perform straight,	science and technical texts,		problem solver who:

	bevel edge cutting	attending to important distinctions	1. Observes and
	operations in the flat and	the author makes and to any gaps or	evaluates situations to
	horizontal positions on	inconsistencies in the account.	define problems
	carbon steel.		3. Identifies patterns,
h.	Manual Oxyfuel Cutting	RST.7.11-12: Integrate and evaluate	trends and relationships
	(OFC): Perform scarfing	multiple sources of information	that apply to solutions
	and gouging operations to	presented in diverse formats and	4. Generates a variety of
	remove base and weld	media (e.g., quantitative data, video,	solutions, builds a case
	metal, in the flat and	multimedia) in order to address a	for a best response and
	horizontal positions on	question or solve a problem.	critically evaluates the
	carbon steel.		effectiveness of the
i.	Mechanized Oxyfuel	RST.8.11-12: Evaluate the	response
	Cutting (OFC) (e.g., Track	hypotheses, data, analysis, and	6. Uses information and
	Burner): Perform safety	conclusions in a science or technical	technology to solve
	inspections of mechanized	text, verifying the data when	problems
	OFC equipment and	possible and corroborating or	
	accessories.	challenging conclusions with other	E. An integrative and
j.	Mechanized Oxyfuel	sources of information.	informed thinker who:
	Cutting: Make minor		2. Evaluates and
	external repairs to	Peer Teaching/Introduction of	synthesizes information
	mechanized OFC	Tech Course to Younger	from multiple sources
	equipment and accessories.	Students/Presenting a Project	3. Applies ideas across
k.	Mechanized Oxyfuel	(optional)	disciplines
	Cutting: Set up for	AND	4. Applies systems
	mechanized OFC	Oral Demonstration of Skill	thinking to understand the
	operations on carbon steel.	(optional)	interaction and influence
١.	Mechanized Oxyfuel	SL.1.11-12: Initiate and participate	of related parts on each
	Cutting: Operate	effectively in a range of collaborative	other and on outcomes
	mechanized OFC	discussions (one-on-one, in groups,	
	equipment on carbon steel.	and teacher-led) with diverse	
m.	Mechanized Oxyfuel	partners on grades 11-12 topics,	
	Cutting: Perform straight,	texts, and issues, building on others'	
	square edge cutting	ideas and expressing their own	

	operations in the flat	clearly and persuasively.	
	position on carbon steel.	a. Come to discussions prepared,	
n.	Mechanized Oxyfuel	having read and researched material	
	Cutting: Perform straight,	under study; explicitly draw on that	
	bevel edge cutting	preparation by referring to evidence	
	operations in the flat	from texts and other research on the	
	position on carbon steel.	topic or issue to stimulate a	
0.	Manual Plasma Arc Cutting	thoughtful, well-reasoned exchange	
	(PAC): Perform safety	of ideas.	
	inspections of manual PAC	b. Work with peers to promote civil,	
	equipment and accessories.	democratic discussions and	
p.	Manual Plasma Arc Cutting:	decision-making, set clear goals and	
	Make minor external repairs	deadlines, and establish individual	
	to manual PAC equipment	roles as needed.	
	and accessories.	c. Propel conversations by posing	
q.	Manual Plasma Arc Cutting:	and responding to questions that	
	Set up for manual PAC	probe reasoning and evidence;	
	operations on carbon steel,	ensure a hearing for a full range of	
	austenitic stainless steel	positions on a topic or issue; clarify,	
	and aluminum.	verify, or challenge ideas and	
r.	Manual Plasma Arc Cutting:	conclusions; and promote divergent	
	Operate manual PAC	and creative perspectives.	
	equipment on carbon steel,	d. Respond thoughtfully to diverse	
	austenitic stainless steel,	perspectives; synthesize comments,	
	and aluminum.	claims, and evidence made on all	
s.	Manual Plasma Arc Cutting:	sides of an issue; resolve	
	Perform straight, square	contradictions when possible; and	
	edge cutting operations in	determine what additional	
	the flat and horizontal	information or research is required to	
	positions on carbon steel,	deepen the investigation or complete	
	austenitic stainless steel	the task.	
	and aluminum.		
t.	Manual Plasma Arc Cutting:		

Perform shape, square		
edge cutting operations in		
the flat and horizontal		
positions on carbon steel,		
austenitic stainless steel		
and aluminum.		
u. Manual Air Carbon Arc		
Cutting (CAC-A): Perform		
safety inspections of		
manual CAC-A equipment		
and accessories.		
v. Manual Air Carbon Arc		
Cutting: Make minor		
external repairs to manual		
CAC-A equipment and		
accessories.		
w. Manual Air Carbon Arc		
Cutting: Set up for manual		
CAC-A scarfing and		
gouging operations on		
carbon steel.		
x. Manual Air Carbon Arc		
Cutting: Operate manual		
CAC-A equipment on		
carbon steel.		
y. Manual Air Carbon Arc		
Cutting: Perform scarfing		
and gouging operations to		
remove base and weld		
metal in the flat and		
horizontal positions on		
carbon steel.		

9.	9. Welding Inspection and Testing				
a.	Examine cut surfaces and	Handout/Textbook/Manual	Through this cluster, students	A. A clear and effective	
	edges of prepared base	Reading (optional)	might read and understand the	communicator who:	
	metal parts.	RST.2.11-12: Determine the central	central ideas and vocabulary	1. Demonstrates	
		ideas or conclusions of a text;	in various texts, listen	organized and purposeful	
b.	Examine tacks, root	summarize complex concepts,	to/understand DVD instruction,	communication in English	
	passes, intermediate layers	processes, or information presented	participate in problem solving	and at least one other	
	and completed welds.	in a text by paraphrasing them in	activities that may require the	language (without "one	
		simpler but still accurate terms.	use of multiple sources,	other language,")	
			participate in peer	2. Uses evidence and	
		RST.4.11-12: Determine the	teaching/presentation	logic appropriately in	
		meaning of symbols, key terms, and	activities, and verbally present	communication	
		other domain specific words and	information.	3. Adjusts communication	
		phrases as they are used in a		based on the audience	
		specific scientific or technical context			
		relevant to grades 11–12 texts and		B. A self-directed and	
		topics.		lifelong learner who:	
				1. Recognizes the need	
		DVD Instruction (optional)		for information and	
		Possibly SL.3.11-12: Evaluate a		locates and evaluates	
		speaker's point of view, reasoning,		resources	
		and use of evidence and rhetoric,		4. Demonstrates initiative	
		assessing the stance, premises,		and independence	
		links among ideas, word choice,		5. Demonstrates flexibility	
		points of emphasis, and tone used.		including the ability to	
				learn, unlearn and relearn	
		Problem Solving Activity		6. Demonstrates reliability	
		(optional)		and concern for quality	
		RST.1.11-12: Cite specific textual			
		evidence to support analysis of		C. Creative and practical	
		science and technical texts,		problem solver who:	
		attending to important distinctions		1. Observes and	
		the author makes and to any gaps or		evaluates situations to	

inconsistencies in the account.	define problems
	3. Identifies patterns,
RST.7.11-12: Integrate and evaluate	trends and relationships
multiple sources of information	that apply to solutions
presented in diverse formats and	4. Generates a variety of
media (e.g., quantitative data, video,	solutions, builds a case
multimedia) in order to address a	for a best response and
question or solve a problem.	critically evaluates the
	effectiveness of the
RST.8.11-12: Evaluate the	response
hypotheses, data, analysis, and	6. Uses information and
conclusions in a science or technical	technology to solve
text, verifying the data when	problems
possible and corroborating or	
challenging conclusions with other	E. An integrative and
sources of information.	informed thinker who:
	2. Evaluates and
Peer Teaching/Introduction of	synthesizes information
Tech Course to Younger	from multiple sources
Students/Presenting a Project	3. Applies ideas across
(optional)	disciplines
AND	4. Applies systems
Oral Demonstration of Skill	thinking to understand the
(optional)	interaction and influence
SL.1.11-12: Initiate and participate	of related parts on each
effectively in a range of collaborative	other and on outcomes
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.	
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.	
b. Work with peers to promote civil,	
democratic discussions and	
decision-making, set clear goals and	
deadlines, and establish individual	
roles as needed.	
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.	
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.	