

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

Electrical; CIP: 46.0302

National Construction Career Education Research (NCCER)-Core
Intersections with

Maine College and Career Readiness-English Language Arts Standards

Framework, Duties, and Tasks	English Language Arts Standards (CCSS)	Demonstration of Proficiency (Possible Evidence, Project, Performance Assessment, Certification etc.)	Maine Learning Results- Guiding Principles, and Career and Education Development
1. Basic Safety (Construction Site Safety Orientation)			
<p>a. Describe the importance of safety, the causes of workplace incidents, and the process of hazard recognition and control.</p> <p>i. Define incidents and the significant costs associated with them.</p> <p>ii. Identify the common causes of incidents and their related consequences.</p> <p>iii. Describe the processes related to hazard recognition and control, including the Hazard Communication (HAZCOM) Standard and the provisions of a Safety Data Sheet (SDS).</p> <p>b. Describe the safe work requirements for elevated work, including fall protection guidelines.</p> <p>i. Identify and describe various fall hazards.</p> <p>ii. Identify and describe equipment and methods used in fall prevention and fall arrest.</p> <p>iii. Identify and describe the safe use of ladders and stairs.</p> <p>iv. Identify and describe the safe use of scaffolds.</p>	<p>RST.2: 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: 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 <i>grades 11-12 texts and topics</i>.</p> <p>RST.6: Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.</p> <p>RST.7: 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>	<ol style="list-style-type: none"> 1. Written test by NCCER 2. Identify several categories of workplace injuries and their causes. 3. Describe information obtained from a SDS. 4. Inspect the following PPE items and determine if they are safe to use: <ol style="list-style-type: none"> a. Eye protection b. Hearing Protection c. Hard Hat d. Gloves e. Fall harnesses, lanyards, and connectors f. Approved footwear. Properly set up and climb/ descend an extension ladder, demonstrating proper three-point contact. 5. Explain the classes of ladders and demonstrate pre-use inspection of ladders. 6. Properly don, fit, and remove the following PPE items: <ol style="list-style-type: none"> a. Eye protection b. Hearing Protection 	

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<p>c. Identify and explain how to avoid struck-by and caught-in-between hazards.</p> <p>i. Identify and explain how to avoid struck-by and caught-in-between hazards.</p> <p>ii. Identify and explain how to avoid caught-in and caught-between hazards.</p> <p>d. Identify common energy-related hazards and explain how to avoid them.</p> <p>i. Describe basic job-site electrical safety guidelines.</p> <p>ii. Explain the importance of lockout/tagout and describe basic procedures.</p> <p>e. Identify and describe the proper use of personal protective equipment (PPE).</p> <p>i. Identify and describe the basic use of PPE used to protect workers from bodily injury.</p> <p>ii. Identify potential respiratory hazards and the basic respirators used to protect workers against those hazards.</p> <p>f. Identify and describe other specific job-site safety hazards.</p> <p>i. Identify various exposure hazards commonly found on job sites.</p> <p>ii. Identify hazards associated with environmental extremes.</p> <p>iii. Identify hazards associated with hot work.</p> <p>iv. Identify fire hazards and describe basic firefighting procedures.</p>	<p>RST.10: By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.</p> <p>SL.1: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on <i>grades 11-12 topics, texts, and issues</i>, building on others' ideas and expressing their own clearly and persuasively.</p> <p>SL.6: Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate.</p> <p>WHST.4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>	<p>c. Hard hat</p> <p>d. Gloves</p> <p>e. Fall arrest harness</p> <p>7. Inspect a typical power cord and GFCI to ensure their serviceability.</p>	

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v. Identify confined spaces and describe the related safety considerations.			
2. Introduction to Construction Math			
<p>a. Identify whole numbers and demonstrate how to work with them mathematically.</p> <p>i. Identify different whole numbers and their place values.</p> <p>ii. Demonstrate the ability to add and subtract whole numbers.</p> <p>iii. Demonstrate the ability to multiply and divide whole numbers.</p> <p>b. Explain how to work with fractions.</p> <p>i. Define equivalent fractions and show how to find lowest common denominators.</p> <p>ii. Describe improper fractions and demonstrate how to change an improper fraction to a mixed number.</p> <p>iii. Demonstrate the ability to add and subtract fractions.</p> <p>iv. Demonstrate the ability to multiple and divide fractions.</p> <p>c. Describe the decimal system and explain how to work with decimals.</p> <p>i. Describe decimals and their place values.</p> <p>ii. Demonstrate the ability to add, subtract, multiply, and divide decimals.</p> <p>iii. Demonstrate the ability to convert between decimals, fractions, and percentages.</p> <p>d. Identify various tools used to measure length and show how they</p>	<p>RST.2: 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.3: Follow precisely a complex multi-step procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.</p> <p>RST.4: 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 <i>grades 11-12 texts and topics</i>.</p> <p>RST.7: 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>SL.1: Initiate and participate effectively in a range of collaborative discussions (one-</p>	1. Written test by NCCER	

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<p>are used.</p> <ul style="list-style-type: none"> i. Identify and demonstrate how to use rulers. ii. Identify and demonstrate how to use measuring tapes. e. Identify and convert units of length, weight, volume, and temperature between the imperial and metric systems of measurement. <ul style="list-style-type: none"> i. Identify and convert units of length measurement between the imperial and metric systems. ii. Identify and convert units of weight measurement between the imperial and metric systems. iii. Identify and convert units of volume measurement between the imperial and metric systems. iv. Identify and convert units of temperature measurement between the imperial and metric systems. f. Identify basic angles and geometric shapes and explain how to calculate their area and volume. <ul style="list-style-type: none"> i. Identify various types of angles. ii. Identify basic geometric shapes and their characteristics. iii. Demonstrate the ability to calculate the area of two-dimensional shapes. iv. Demonstrate the ability to calculate the volume of three-dimensional shapes. 	<p>on-one, in groups, and teacher-led) with diverse partners on <i>grades 11-12 topics, texts, and issues</i>, building on others' ideas and expressing their own clearly and persuasively.</p>		
3. Introduction to Hand Tools			
<ul style="list-style-type: none"> a. Identify and explain how to use various types of hand tools. <ul style="list-style-type: none"> i. Identify and explain how to use various types of hammers and 	<p>RST.2: Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information</p>	<ul style="list-style-type: none"> 1. Written test by NCCER 2. Demonstrate ability to identify and inspect several hand tools to be safe for use. 	

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<p>demolition tools.</p> <p>ii. Identify and explain how to use various types of chisels and punches.</p> <p>iii. Identify and explain how to use various types of screwdrivers.</p> <p>iv. Identify and explain how to use various types of non-adjustable and adjustable wrenches.</p> <p>v. Identify and explain how to use various types of socket and torque wrenches.</p> <p>vi. Identify and explain how to use various types of pliers and wire cutters.</p> <p>b. Identify and explain how to use various types of measurement and layout tools.</p> <p>i. Identify and explain how to use rules and other measuring tools.</p> <p>ii. Identify and explain how to use various types of levels and layout tools.</p> <p>c. Identify and explain how to use various types of cutting and shaping tools.</p> <p>i. Identify and explain how to use handsaws.</p> <p>ii. Identify and explain how to use various types of files and utility knives.</p> <p>d. Identify and explain how to use other common hand tools.</p> <p>i. Identify and explain how to use shovels and picks.</p> <p>ii. Identify and explain how to use chain falls and come-alongs.</p> <p>iii. Identify and explain how to use various types of clamps.</p>	<p>presented in a text by paraphrasing them in simpler but still accurate terms.</p> <p>RST.4: 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 <i>grades 11-12 texts and topics</i>.</p> <p>RST.6: Analyze the author’s purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.</p> <p>RST.7: 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.10: By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.</p> <p>SL.1: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on <i>grades 11-12 topics, texts, and issues, building on others’ ideas</i></p>	<p>3. Safely and properly use several hand tools.</p> <p>4. Make a straight, square cut in framing lumber using a crosscut saw.</p>	

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	<p>and expressing their own clearly and persuasively.</p> <p>SL.6: Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate.</p> <p>WHST.4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>		
4. Introduction to Power Tools			
<p>a. Identify and explain how to use various types of power drills and impact wrenches.</p> <p>i. Identify and explain how to use common power drills and bits.</p> <p>ii. Identify and explain how to use a hammer drill.</p> <p>iii. Identify and explain how to use pneumatic drills and impact wrenches.</p> <p>b. Identify and explain how to use various types of power saws.</p> <p>i. Identify and explain how to use a circular saw.</p> <p>ii. Identify and explain how to use saber and reciprocating saws.</p> <p>iii. Identify and explain how to use a portable band saw.</p> <p>iv. Identify and explain how to use miter and cutoff saws.</p> <p>c. Identify and explain how to use various grinders and grinder attachments.</p> <p>i. Identify and explain how to use various types of grinders.</p>	<p>RST.2: 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: 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 <i>grades 11-12 texts and topics</i>.</p> <p>RST.6: Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.</p> <p>RST.7: Integrate and evaluate multiple sources of information presented in diverse formats and</p>	<p>1. Written test by NCCER</p> <p>2. Safely and properly demonstrate the use of several power tools.</p>	

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<p>ii. Identify and explain how to use various grinder accessories and attachments.</p> <p>b. Identify and explain how to use miscellaneous power tools.</p> <p>i. Identify and explain how to use pneumatic and powder-actuated fastening tools.</p> <p>ii. Identify and explain how to use pavement breakers.</p> <p>iii. Identify and explain the uses of hydraulic jacks.</p>	<p>media (e.g., quantitative data, video, multimedia) in order to address a question or solve a problem.</p> <p>RST.10: By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.</p> <p>SL.1: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on <i>grades 11-12 topics, texts, and issues</i>, building on others' ideas and expressing their own clearly and persuasively.</p> <p>SL.6: Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate.</p> <p>WHST.4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>		
5. Introduction to Construction Drawings			
<p>a. Identify and describe various types of construction drawings, including their fundamental components and features.</p> <p>i. Identify various types of construction drawings.</p> <p>ii. Identify and describe the purpose of</p>	<p>RST.2: 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>1. Written test by NCCER</p> <p>2. Using floor plans:</p> <ol style="list-style-type: none"> Locate common walls. Determine the distance/lengths. Determine 	

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<p>the five basic construction drawing components.</p> <p>iii. Identify and explain the significance of various drawing elements, such as lines of construction, symbols, and grid lines.</p> <p>iv. Identify and explain the use of dimensions and various drawing scales.</p> <p>v. Identify and describe how to use engineer's and architect's scales.</p>	<p>RST.4: 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 <i>grades 11-12 texts and topics</i>.</p> <p>RST.6: Analyze the author's purpose in providing an explanation, describing a procedure, or discussing an experiment in a text, identifying important issues that remain unresolved.</p> <p>RST.7: 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.9: Synthesize information from a range of sources (e.g., texts, experiments, simulations) into a coherent understanding of a process, phenomenon, or concept, resolving conflicting information when possible.</p> <p>RST.10: By the end of grade 12, read and comprehend science/technical texts in the grades 11-12 text complexity band independently and proficiently.</p> <p>SL.1: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-</p>	<p>elevations.</p>	

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	<p>led) with diverse partners on <i>grades 11-12 topics, texts, and issues</i>, building on others' ideas and expressing their own clearly and persuasively.</p> <p>SL.6: Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate.</p> <p>WHST.4: Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience.</p>		
6. Introduction to Basic Rigging (elective)			
<p>a. Identify and describe various types of rigging slings, hardware, and equipment.</p> <p>i. Identify and describe various types of slings.</p> <p>ii. Describe how to inspect various types of slings.</p> <p>iii. Identify and describe how to inspect common rigging hardware.</p> <p>iv. Identify and describe various types of hoists.</p> <p>v. Identify and describe basic rigging hitches and the related Emergency Stop hand signal.</p>	Not required	Not required	
7. Basic Communication Skills			
<p>a. Describe the communication, listening, and speaking processes and their relationship to job performance.</p> <p>i. Describe the communication process and the importance of listening and</p>	SL.1: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on	<ol style="list-style-type: none"> 1. Written test by NCCER 2. Perform a given task after listening to verbal instructions. 3. Fill out work-related forms. 4. Read and interpret a set of 	

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<p>speaking skills.</p> <p>ii. Describe the listening process and identify good listening skills.</p> <p>iii. Describe the speaking process and identify good speaking skills.</p> <p>b. Describe good reading and writing skills and their relationship to job performance.</p> <p>i. Describe the importance of good reading and writing skills.</p> <p>ii. Describe job-related reading requirements and identify good reading skills.</p> <p>iii. Describe job-related writing requirements and identify good writing skills.</p>	<p><i>grades 11-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.</i></p> <p>SL.4: Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance and style are appropriate to purpose, audience, and a range of formal and informal tasks.</p> <p>SL.6: Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate.</p>	<p>instructions and verbally instruct another person to perform that task.</p>	
8. Basic Employability Skills			
<p>a. Describe the opportunities in the construction business and how to enter the construction workforce.</p> <p>i. Describe the construction business and the opportunities offered by the trades.</p> <p>ii. Explain how workers can enter the construction workforce.</p> <p>b. Explain the importance of critical thinking and how to solve problems.</p> <p>i. Describe critical thinking and barriers to solving problems.</p> <p>ii. Describe how to solve problems using critical thinking.</p>	<p>SL.1: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on <i>grades 11-12 topics, texts, and issues, building on others' ideas and expressing their own clearly and persuasively.</i></p> <p>SL.4: Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning,</p>	<p>1. Written test by NCCER</p>	

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iii. Describe problems related to planning and scheduling. c. Explain the importance of social skills and identify ways good skills are applied in the construction trade. i. Identify good personal and social skills. ii. Explain how to resolve conflicts with co-workers and supervisors. iii. Explain how to give and receive constructive criticism. iv. Identify and describe various social issues of concern in the workplace. v. Describe how to work in a team environment and how to be an effective leader.	alternative or opposing perspectives are addressed, and the organization, development, substance and style are appropriate to purpose, audience, and a range of formal and informal tasks. SL.6: Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate.		
9. Introduction to Materials Handling			
a. Describe the basic concepts of material handling and common safety precautions. i. Describe the basic concepts of material handling and manual lifting. ii. Identify common material-handling safety precautions. iii. Identify and describe how to tie knots commonly used in material handling. b. Identify various types of material handling equipment and describe how they are used. i. Identify non-motorized material-handling equipment and describe how they are used. ii. Identify motorized material-handling equipment and describe how they are used.	SL.1: Initiate and participate effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on <i>grades 11-12 topics, texts, and issues</i> , building on others' ideas and expressing their own clearly and persuasively. SL.4: Present information, findings, and supporting evidence, conveying a clear and distinct perspective, such that listeners can follow the line of reasoning, alternative or opposing perspectives are addressed, and the organization, development, substance and style are appropriate to purpose, audience, and a range of formal	1. Written test by NCCER 2. Demonstrate safe manual lifting techniques. 3. Demonstrate how to tie several common knots.	

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	<p>and informal tasks.</p> <p>SL.6: Adapt speech to a variety of contexts and tasks, demonstrating a command of formal English when indicated or appropriate.</p>		

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