Department of College and Career Readiness

Carpentry I

5.0 Credits

Unit One
Carpentry I

Course Description

The carpentry trade offers numerous career opportunities, from constructing concrete forms to creating fine cabinetry. Carpenters build beautiful structures that can last for centuries and have one of the highest job satisfaction rated of any career in the construction industry. They have opportunities to work in residential, commercial, and industrial construction. Carpenters are required to work safely to ensure their own personal safety and the safety of others on the job site.

Carpentry I level course provides students with an orientation to the carpentry trade in the construction industry. Students will be exposed to an array of career and cluster opportunities in this trade. Concepts of building construction are introduced including construction drawings, specification and layouts, Floor Systems, Wall Systems, Ceiling Joist and Roof Systems and Structure Enclosure systems are developed in subsequent sequences. Knowledge and skills of safety practices, safe use of tools and equipment and building code underlie the content.

This course provides a prerequisite for the next level. Students will be able to build small projects such as jewelry box, wall shelves, small cabinets, tables and tool boxes.
## Carpentry I

### Pacing Guide

<table>
<thead>
<tr>
<th>Unit</th>
<th>Topic</th>
<th>Suggested Timing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unit 1</td>
<td>Workshop/workplace basic safety</td>
<td>approx. 3 weeks</td>
</tr>
<tr>
<td>Unit 2</td>
<td>Introduction to Construction mathematics</td>
<td>approx. 3 weeks</td>
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<tr>
<td>Unit 3</td>
<td>Building Material, Fasteners, and Adhesives</td>
<td>approx. 15 weeks</td>
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<tr>
<td>Unit 4</td>
<td>Introduction to Hand tools and Power tools</td>
<td>approx. 15 weeks</td>
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</tbody>
</table>
## Educational Technology Standards

### 8.1.12.A.1, 8.1.12.B.2, 8.1.12.C.1, 8.1.12.F.1

<table>
<thead>
<tr>
<th>Category</th>
<th>Description</th>
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</table>
| Technology Operations and Concepts            | *Create a personal digital portfolio which reflects personal and academic interests, achievements, and career aspirations by using a variety of digital tools and resources.*  
  **Example within this unit:** Students can document their work in an electronic portfolio throughout. |
| Creativity and Innovation                     | *Apply previous content knowledge by creating and piloting a digital learning game or tutorial.*  
  **Example within this unit:** Students will utilize in-class technology to create products associated with curriculum goals.                                |
| Communication and Collaboration              | *Develop an innovative solution to a real world problem or issue in collaboration with peers and experts, and present ideas for feedback through social media or in an online community.*  
  **Example within this unit:** Students will utilize technology to collaborate in out-of-classroom assignments.                               |
| Critical Thinking, Problem Solving, Decision Making | *Evaluate the strengths and limitations of emerging technologies and their impact on educational, career, personal and or social needs.*  
  **Example within this unit:** Students will utilize technology to overcome obstacles via critical thinking and problem solving. |
Career Ready Practices

Career Ready Practices describe the career-ready skills that all educators in all content areas should seek to develop in their students. They are practices that have been linked to increase college, career, and life success. Career Ready Practices should be taught and reinforced in all career exploration and preparation programs with increasingly higher levels of complexity and expectation as a student advances through a program of study.

CRP2. Apply appropriate academic and technical skills.
Career-ready individuals readily access and use the knowledge and skills acquired through experience and education to be more productive. They make connections between abstract concepts with real-world applications, and they make correct insights about when it is appropriate to apply the use of an academic skill in a workplace situation.
Example within this unit: Students will utilize learned technical skills to produce products that reflect industry standards.

CRP8. Utilize critical thinking to make sense of problems and persevere in solving them.
Career-ready individuals readily recognize problems in the workplace, understand the nature of the problem, and devise effective plans to solve the problem. They are aware of problems when they occur and take action quickly to address the problem; they thoughtfully investigate the root cause of the problem prior to introducing solutions. They carefully consider the options to solve the problem. Once a solution is agreed upon, they follow through to ensure the problem is solved, whether through their own actions or the actions of others.
Example within this unit: When faced with a challenge in the construction of their assigned outcome, students must utilize critical thinking skills to adjust ensure quality.

CRP11. Use technology to enhance productivity.
Career-ready individuals find and maximize the productive value of existing and new technology to accomplish workplace tasks and solve workplace problems. They are flexible and adaptive in acquiring new technology. They are proficient with ubiquitous technology applications. They understand the inherent risks-personal and organizational-of technology applications, and they take actions to prevent or mitigate these risks.
Example within this unit: Students must utilized required tools and technology throughout.
**WIDA Proficiency Levels:** At the given level of English language proficiency, English language learners will process, understand, produce or use:

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
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</table>
| **6- Reaching** | - Specialized or technical language reflective of the content areas at grade level  
- A variety of sentence lengths of varying linguistic complexity in extended oral or written discourse as required by the specified grade level  
- Oral or written communication in English comparable to proficient English peers |
| **5- Bridging** | - Specialized or technical language of the content areas  
- A variety of sentence lengths of varying linguistic complexity in extended oral or written discourse, including stories, essays or reports  
- Oral or written language approaching comparability to that of proficient English peers when presented with grade level material. |
| **4- Expanding** | - Specific and some technical language of the content areas  
- A variety of sentence lengths of varying linguistic complexity in oral discourse or multiple, related sentences or paragraphs  
- Oral or written language with minimal phonological, syntactic or semantic errors that may impede the communication, but retain much of its meaning, when presented with oral or written connected discourse, with sensory, graphic or interactive support |
| **3- Developing** | - General and some specific language of the content areas  
- Expanded sentences in oral interaction or written paragraphs  
- Oral or written language with phonological, syntactic or semantic errors that may impede the communication, but retain much of its meaning, when presented with oral or written, narrative or expository descriptions with sensory, graphic or interactive support |
| **2- Beginning** | - General language related to the content area  
- Phrases or short sentences  
- Oral or written language with phonological, syntactic, or semantic errors that often impede the communication when presented with one to multiple-step commands, directions, or a series of statements with sensory, graphic or interactive support |
| **1- Entering** | - Pictorial or graphic representation of the language of the content areas  
- Words, phrases or chunks of language when presented with one-step commands directions, WH-, choice or yes/no questions, or statements with sensory, graphic or interactive support |
# Language Development Supports For English Language Learners

## To Increase Comprehension and Communication Skills

### Environment

- Welcoming and stress-free
- Respectful of linguistic and cultural diversity
- Honors students’ background knowledge
- Sets clear and high expectations
- Includes routines and norms
- Is thinking-focused vs. answer-seeking
- Offers multiple modalities to engage in content learning and to demonstrate understanding
- Includes explicit instruction of specific language targets
- Provides participation techniques to include all learners

- Integrates learning centers and games in a meaningful way
- Provides opportunities to practice and refine receptive and productive skills in English as a new language
- Integrates meaning and purposeful tasks/activities that:
  - Are accessible by all students through multiple entry points
  - Are relevant to students’ lives and cultural experiences
  - Build on prior mathematical learning
  - Demonstrate high cognitive demand
  - Offer multiple strategies for solutions
  - Allow for a language learning experience in addition to content

### Sensory Supports*

- Real-life objects (realia) or concrete objects
- Physical models
- Manipulatives
- Pictures & photographs
- Visual representations or models such as diagrams or drawings
- Videos & films
- Newspapers or magazines
- Gestures
- Physical movements
- Music & songs

### Graphic Supports*

- Graphs
- Charts
- Timelines
- Number lines
- Graphic organizers
- Graphing paper

### Interactive Supports*

- In a whole group
- In a small group
- With a partner such as Turn-and-Talk
- In pairs as a group (first, two pairs work independently, then they form a group of four)
- In triads
- Cooperative learning structures such as Think-Pair-Share
- Interactive websites or software
- With a mentor or coach

### Verbal and Textual Supports

- Labeling
- Students’ native language
- Modeling
- Repetitions
- Paraphrasing
- Summarizing
- Guiding questions
- Clarifying questions
- Probing questions
- Leveled questions such as What? Where? How? Why?
- Questioning prompts & cues
- Word Banks
- Sentence starters
- Sentence frames
- Discussion frames
- Talk moves, including Wait Time

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BUILDING EQUITY IN YOUR TEACHING PRACTICE

How do the essential questions highlight the connection between the big ideas of the unit and equity in your teaching practice?

<table>
<thead>
<tr>
<th>CONTENT INTEGRATION</th>
<th>KNOWLEDGE CONSTRUCTION</th>
<th>PREJUDICE REDUCTION</th>
<th>EQUITABLE PEDAGOGY</th>
<th>EMPOWERING SCHOOL CULTURE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teachers use examples and content from a variety of cultures &amp; groups.</td>
<td>Teachers help students understand how knowledge is created and influenced by cultural assumptions, perspectives &amp; biases.</td>
<td>Teachers implement lessons and activities to assert positive images of ethnic groups &amp; improve intergroup relations.</td>
<td>Teachers modify techniques and methods to facilitate the academic achievement of students from diverse backgrounds.</td>
<td>Using the other four dimensions to create a safe and healthy educational environment for all.</td>
</tr>
</tbody>
</table>

This unit / lesson is connected to other topics explored with students.

This unit / lesson provides context to the history of privilege and oppression.

This unit / lesson helps students to develop research and critical thinking skills.

This curriculum creates windows and mirrors* for students.

This unit / lesson helps students question and unpack biases & stereotypes.

This unit / lesson helps students examine, research and question information and sources.

The curriculum encourages discussion and understanding about the groups of people being represented.

The instruction has been modified to meet the needs of each student.

Students feel respected and their cultural identities are valued.

Additional supports have been provided for students to become successful and independent learners.

Opportunities are provided for students to reflect on their learning and provide feedback.

There are opportunities for students to connect with the community.

My classroom is welcoming and supportive for all students?

I am aware of and sensitive to the needs of my students and their families.

There are effective parent communication systems established. Parents can talk to me about issues as they arise in my classroom.

*Windows and Mirrors: a framework developed by Critical Race Theory scholar Critical Race Theory scholar Kimberlé Crenshaw to describe how issues of intersectionality and oppression are portrayed in educational materials.
# Culturally Relevant Pedagogy Examples

- **Relationships:**
  - Learn about your students’ individual cultures.
  - Adapt your teaching to the way your students learn.
  - Develop a connection with challenging students.
  - Communicate and work with parents/guardians on a regular basis (email distribution, newsletter, phone calls, notes, meetings, etc.).

- **Curriculum:**
  - Incorporate student-centered stories, vocabulary and examples.
  - Incorporate relatable aspects of students’ lives.
  - Create lessons that connect the content to your students’ culture and daily lives.
  - Incorporate instructional materials that relate to a variety of cultures.

- **Instructional Delivery:**
  - Establish an interactive dialogue to engage all students.
  - Continuously interact with students and provide frequent feedback.
  - Use frequent questioning as a means to keep students involved.
  - Intentionally address visual, tactile, and auditory learners.
  - Present relatable real world problems.
# Differentiated Instruction

## Strategies to Accommodate Students Based on Individual Needs

<table>
<thead>
<tr>
<th>Time/General</th>
<th>Processing</th>
<th>Comprehension</th>
<th>Recall</th>
</tr>
</thead>
</table>
| - Extra time for assigned tasks  
- Adjust length of assignment  
- Timeline with due dates for reports and projects  
- Communication system between home and school  
- Provide lecture notes/outline | - Extra Response time  
- Have students verbalize steps  
- Repeat, clarify or reword directions  
- Mini-breaks between tasks  
- Provide a warning for transitions  
- Reading partners | - Precise step-by-step directions  
- Short manageable tasks  
- Brief and concrete directions  
- Provide immediate feedback  
- Small group instruction  
- Emphasize multi-sensory learning | - Teacher-made checklist  
- Use visual graphic organizers  
- Reference resources to promote independence  
- Visual and verbal reminders  
- Graphic organizers |

<table>
<thead>
<tr>
<th>Assistive Technology</th>
<th>Tests/Quizzes/Grading</th>
<th>Behavior/Attention</th>
<th>Organization</th>
</tr>
</thead>
</table>
| - Computer/whiteboard  
- Tape recorder  
- Spell-checker  
- Audio-taped books | - Extended time  
- Study guides  
- Shortened tests  
- Read directions aloud | - Consistent daily structured routine  
- Simple and clear classroom rules  
- Frequent feedback | - Individual daily planner  
- Display a written agenda  
- Note-taking assistance  
- Color code materials |
## Differentiated Instruction

### Strategies to Accommodate Students Based on Content-Specific Needs

- Extra time for assigned tasks
- Student-led exemplars
- Adjust length of assignment
- Timeline with due dates for reports and projects
- One-on-One instruction
- Small group instruction
- Assistive Technology
- Translation Software
Enrichment

Strategies Used to Accommodate Based on Students Individual Needs:

- Adaption of Material and Requirements
- Evaluate Vocabulary
- Elevated Text Complexity
- Additional Projects
- Independent Student Options
- Projects completed individual or with Partners
- Self Selection of Research
- Tiered/Multilevel Activities
- Learning Centers
- Individual Response Board
- Independent Book Studies
- Open-ended activities
- Community/Subject expert mentorships
## Assessments

### Suggested Formative/Summative Classroom Assessments

- Timelines, Maps, Charts, Graphic Organizers
- Teacher-created Unit Assessments, Chapter Assessments, Quizzes
- Teacher-created DBQs, Essays, Short Answer
- Accountable Talk, Debate, Oral Report, Role Playing, Think Pair, and Share
- Projects, Portfolio, Presentations, Prezi, Gallery Walks
- Homework
- Concept Mapping
- Primary and Secondary Source analysis
- Photo, Video, Political Cartoon, Radio, Song Analysis
- Create an Original Song, Film, or Poem
- Glogster to make Electronic Posters
- Tumblr to create a Blog
## Interdisciplinary Connections

### English Language Arts
- Close reading of various industry content and manuals. (NJSLSA.R1)
- Write professional proposal. (NJSLSA.W2)

### Social Studies
- Research the history of carpentry. (6.1.12)
- Research the social and economic impact of carpentry trades. (6.3.12)

### World Language
- Translate industry-content (7.1.ILA)
- Create a translated index of carpentry trades vocabulary (7.1.ILA)

### Math
- Calculate measurements. (N.Q.A.1)
- Use ratios and proportions to replicate scaled products. (N.Q.A.2)

### Fine & Performing Arts
- Analyze artistic contributions of Paterson and New Jersey. (1.2.12)
- Create a sculpture or work of art. (1.4.12)

### Science
- Research latest technological developments in industry. (HS-ETS1-4)
- Investigate applicable-careers in STEM carpentry trades. (9.2.12)
New Jersey Students Learning Standards

9.3– Career and Technical Education

Career Cluster: Architecture and Construction (AC)

- 9.3.12.AC.1: Use vocabulary, symbols and formulas common to architecture and construction.
- 9.3.12.AC.2: Use architecture and construction skills to create and manage a project.
- 9.3.12.AC.3: Comply with regulations and applicable codes to establish and manage a legal and safe workplace.
- 9.3.12.AC.5: Describe the roles, responsibilities, and relationships found in the architecture and construction trades and professions, including labor/management relationships.
- 9.3.12.AC.6: Read, interpret and use technical drawings, documents and specifications to plan a project.
- 9.3.12.AC.7: Describe career opportunities and means to achieve those opportunities in each of the Architecture & Construction Career Pathways.

Pathway: Construction (AC-CST)

- 9.3.12.AC-CST.1: Describe contractual relationships between all parties involved in the building process.
- 9.3.12.AC-CST.2: Describe the approval procedures required for successful completion of a construction project.
- 9.3.12.AC-CST.3: Implement testing and inspection procedures to ensure successful completion of a construction project.
- 9.3.12.AC-CST.4: Apply scheduling practices to ensure the successful completion of a construction project.
- 9.3.12.AC-CST.5: Apply practices and procedures required to maintain jobsite safety.
- 9.3.12.AC-CST.6: Manage relationships with internal and external parties to successfully complete construction projects.
- 9.3.12.AC-CST.7: Compare and contrast the building systems and components required for a construction project.
- 9.3.12.AC-CST.8: Demonstrate the construction crafts required for each phase of a construction project.
- 9.3.12.AC-CST.9: Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.
Pathway: Design/Pre-Construction (AC-DES)

- 9.3.12.AC-DES.1 Justify design solutions through the use of research documentation and analysis of data.
- 9.3.12.ACDEDES.2 Use effective communication skills and strategies (listening, speaking, reading, writing and graphic communications) to work with clients and colleagues.
- 9.3.12.AC-DES.3 Describe the requirements of the integral systems that impact the design of buildings.
- 9.3.12.AC-DES.4 Apply building codes, laws and rules in the project design.
- 9.3.12.ACDES.5 Identify the diversity of needs, values and social patterns in project design, including accessibility standards.
- 9.3.12.AC-DES.6 Apply the techniques and skills of modern drafting, design, engineering and construction to projects.
- 9.3.12.AC-DES.7 Employ appropriate representational media to communicate concepts and project design.
- 9.3.12.ACDES.8 Apply standards, applications and restrictions pertaining to the selection and use of construction materials, components and assemblies in the project design.

Pathway: Maintenance/Operations (AC-MO)

- 9.3.12.AC-MO.1 Recognize and employ universal construction signs and symbols to function safely in the workplace.
- 9.3.12.AC-MO.3 Apply construction skills when repairing, restoring or renovating existing buildings.
- 9.3.12.AC-MO.4 Determine work required to repair or renovate an existing building.
- 9.3.12.AC-MO.5 Plan and practice preventative maintenance activities to service existing buildings.
- 9.3.12.AC-MO.6 Maintain and inspect building systems to achieve safe and efficient operation of buildings.
Common Career Technical Core (CCTC)

Architecture and Construction Career Cluster (AC)

AC 1. Use vocabulary, symbols and formulas common to architecture and construction.
AC 2. Use architecture and construction skills to create and manage a project.
AC 3. Comply with regulations and applicable codes to establish and manage a legal and safe workplace.
AC 4. Evaluate the nature and scope of the Architecture & Construction Career Cluster and the role of architecture and construction in society and the economy.
AC 5. Describe the roles, responsibilities and relationships found in the architecture and construction trades and professions, including labor/management relationships.
AC 6. Read, interpret and use technical drawings, documents and specifications to plan a project.
AC 7. Describe career opportunities and means to achieve those opportunities in each of the Architecture and Construction career pathways.

Construction Career Pathway (AC-CST)

AC-CST 1. Describe contractual relationships between all parties involved in the building process.
AC-CST 2. Describe the approval procedures required for successful completion of a construction project.
AC-CST 3. Implement testing and inspection procedures to ensure successful completion of a construction project.
AC-CST 4. Apply scheduling practices to ensure the successful completion of a construction project.
AC-CST 5. Apply practices and procedures required to maintain jobsite safety.
AC-CST 6. Manage relationships with internal and external parties to successfully complete construction projects.
AC-CST 7. Compare and contrast the building systems and components required for a construction project.
AC-CST 8. Demonstrate the construction crafts required for each phase of a construction project.
AC-CST 9. Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.
Design/Pre-Construction Career Pathway (AC-DES)

AC-DES.1. Justify design solutions through the use of research documentation and analysis of data.
AC-DES.2. Use effective communication skills and strategies (listening, speaking, reading, writing and graphic communications) to work with clients and colleagues.
AC-DES.3. Describe the requirements of the integral systems that impact the design of buildings.
AC-DES.4. Apply building codes, laws and rules in the project design.
AC-DES.5. Identify the diversity of needs, values and social patterns in project design, including accessibility standards.
AC-DES.6. Apply the techniques and skills of modern drafting, design, engineering and construction to projects.
AC-DES.7. Employ appropriate representational media to communicate concepts and project design.
AC-DES.8. Apply standards, applications and restrictions pertaining to the selection and use of construction materials, components and assemblies in the project design.

Maintenance/Operations Career Pathway (AC-MO)

AC-MO.1. Recognize and employ universal construction signs and symbols to function safely in the workplace.
AC-MO.2. Use troubleshooting procedures when solving a maintenance problem in buildings.
AC-MO.3. Apply construction skills when repairing, restoring or renovating existing buildings.
AC-MO.4. Determine work required to repair or renovate an existing building.
AC-MO.5. Plan and practice preventative maintenance activities to service existing buildings.
AC-MO.6. Maintain and inspect building systems to achieve safe and efficient operation of buildings.
New Jersey Students Learning Standards

English-Language Arts

Key Ideas and Details:

- RST.11-12.1. 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.11-12.2. 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.
- RST.11-12.3. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks; analyze the specific results based on explanations in the text.

Craft and Structure:

- RST.11-12.4. 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 grades 11–12 texts and topics.
- RST.11-12.5. Analyze how the text structures information or ideas into categories or hierarchies, demonstrating understanding of the information or ideas.
- RST.11-12.6. 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.

Integration of Knowledge and Ideas:

- RST.11-12.7. 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.
- RST.11-12.8. 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.
- RST.11-12.9. 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.
• RST.11-12.10. By the end of grade 12, read and comprehend science/technical texts in the grades 11–CCR text complexity band independently and proficiently

**Research to Build and Present Knowledge:**

• W.11-12.7 Conduct short as well as more sustained research projects to answer a question (including a self-generated question) or solve a problem; narrow or broaden the inquiry when appropriate; synthesize multiple sources on the subject, demonstrating understanding of the subject under investigation.

**Range of Writing:**

• W.11-12.10 Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of tasks, purposes, and audiences
New Jersey Students Learning Standards

Number and Quantity

N.Q.A.1. Use units as a way to understand problems and to guide the solution of multi-step problems; Choose and interpret units consistently in formulas; Choose and interpret the scale and the origin in graphs and data displays.

N.Q.A.2. Define appropriate quantities for the purpose of descriptive modeling.

N.Q.A.3. Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

Algebra

A.REI.B.3. Solve linear equations and inequalities in one variable, including equations with coefficients represented by letters.

A.CED.A.4. Rearrange formulas to highlight a quantity of interest, using the same reasoning as in solving equations. For example, rearrange Ohm's law $V = IR$ to highlight resistance $R$.

A.SSE.A.1. Interpret expressions that represent a quantity in terms of its context.

A.CED.A.1. Create equations and inequalities in one variable and use them to solve problems. Include equations arising from linear functions and quadratic functions, and simple rational and exponential functions.

A.REI.C.6. Solve systems of linear equations exactly and approximately (e.g., with graphs), focusing on pairs of linear equations in two variables.
A.CED.A.3. Represent constraints by equations or inequalities, and by systems of equations and/or inequalities, and interpret solutions as viable or nonviable options in a modeling context. For example, represent inequalities describing nutritional and cost constraints on combinations of different foods.

Functions

F.LE.A.2 Construct linear and exponential functions, including arithmetic and geometric sequences, given a graph, a description of a relationship, or two input-output pairs (include reading these from a table).

F.LE.B.5. Interpret the parameters in a linear or exponential function in terms of a context

F.BF.A.1. Write a function that describes a relationship between two quantities.
   F.BF.A.1a. Determine an explicit expression, a recursive process, or steps for calculation from a context

F.LE.B.5. Interpret the parameters in a linear or exponential function in terms of a context

Geometry

G.CO.A.2. Represent transformations in the plane using, e.g., transparencies and geometry software; describe transformations as functions that take points in the plane as inputs and give other points as outputs. Compare transformations that preserve distance and angle to those that do not (e.g., translation versus horizontal stretch).

G.CO.A.4. Develop definitions of rotations, reflections, and translations in terms of angles, circles, perpendicular lines, parallel lines, and line segments.

G.CO.B.6. Use geometric descriptions of rigid motions to transform figures and to predict the effect of a given rigid motion on a given figure; given two figures, use the definition of congruence in terms of rigid motions to decide if they are congruent.
G.CO.D.12. Make formal geometric constructions with a variety of tools and methods (compass and straightedge, string, reflective devices, paper folding, dynamic geometric software, etc.). Copying a segment; copying an angle; bisecting a segment; bisecting an angle; constructing perpendicular lines, including the perpendicular bisector of a line segment; and constructing a line parallel to a given line through a point not on the line.

G.CO.D.13. Construct an equilateral triangle, a square, and a regular hexagon inscribed in a circle

G.SRT.B.5. Use congruence and similarity criteria for triangles to solve problems and to prove relationships in geometric figures.

G.GPE.B.6. Find the point on a directed line segment between two given points that partitions the segment in a given ratio.

G.GPE.B.7. Use coordinates to compute perimeters of polygons and areas of triangles and rectangles, e.g., using the distance formula.

G.SRT.C.8. Use trigonometric ratios and the Pythagorean Theorem to solve right triangles in applied problems.
**Course:** Carpentry I  
**Unit:** 1. Workshop/Workplace Safety in the Construction Industry  
**Grade Level:** 9-12

**Unit Overview:** This unit provides knowledge and skills for best practice of safety in the workshop and workplace in the construction industry. Students will become aware of the importance of safety procedures, tool use, appropriate attire and proper eye and body protection.

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**NJ CTE STANDARDS: NCCER standards**

- 9.3.12.AC 1,3, 4,6, 7;  
- 9.3.12.AC-CST. 5, 6, 9;  
- 9.3.12.AC-DES 1,4, 8;  
- 9.3.12.AC-MO 1, 6;

**Common Career Technical Core (CCTC):**

- AC 1,3,7;  
- AC-CST 5,6, 7,9;  
- AC-DES 1,4,8;  
- AC-MO1,6;

**NJSLS ELA:**

- ELA-LITERACY.RST.11-12.1; ELA-LITERACY.RST.11-12.2RL.9-10.1; CCSS.ELA-LITERACY.RST.11-12.3; ELA-LITERACY.RST.11-12.10; ELA-LITERACY.W.11-12.10;

**Math Standards:**

- N.Q.A.1-3.
<table>
<thead>
<tr>
<th>Student Learning Objectives (SLOs)</th>
<th>Essential Questions</th>
<th>Skills &amp; Indicators</th>
<th>Sample Activities</th>
<th>Resources</th>
</tr>
</thead>
</table>
| 1.1. Identify and practice safety in the workshop/workplace with regards self:  
  - Worker responsibility  
  - Personal protective equipment  
  - Safe work habits  
  - Good housekeeping. | Is safety a life-long mindset?  
How do you know when the workshop/site is safe? | Identifying terminology and safety rules for personal protection, housekeeping and first aid.  
Locating safety centers in the workshop.  
Being aware of safety policy in the workshop. | Inspect the following PPE items and determine if they are safe to use: eye protection; hearing protection; hard hat; gloves; fall arrest harnesses; lanyards; connecting devices; approved footwear  
Practicing acceptable attributes in the workshop.  
Read text on Building Trades (several in the workshop reference).  
Be familiar with residential symbols in blueprints and drawings (symbols and emergency exits are on anchor charts about the workshop). | Library.  
Safety in workshops-reference book on Technical Education.  
IDEA (disability).  
http://www.parentcenterhub.org/repository/legacy/  
OSHA Website  
Video:  
https://www.youtube.com/watch?v=6o3kE3dGaRw  
Workshop:  
Safety Manuals for the tools.  
District Safety Manual.  
Trainee Guide 5th Edition. NCCER. |

**NJ CTE STANDARDS**
9.3.12.AC 1,3;  
9.3.12.AC-CST 5, 9;  
9.3.12.AC-DES 4,8;  
9.3.12.AC-MO.1, 6;  

**CCTC:**
AC 1,3; AC-CST 5,9;  
AC-DES 4,8; AC-MO1,6;  

**CCSS:** RL.9-10.1; RI.9-10.5; SL.9-10.1
<table>
<thead>
<tr>
<th>Student Learning Objectives (SLOs)</th>
<th>Essential Questions</th>
<th>Skills &amp; Indicators</th>
<th>Sample Activities</th>
<th>Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Electrical safety</td>
<td></td>
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<td>Pearson.</td>
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<tr>
<td>• Material handling safety, hazardous materials, confined spaces, excavations, barricades,</td>
<td></td>
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<td></td>
<td>Online</td>
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<tr>
<td></td>
<td>Research building codes and laws associated with building industry (search under “municipality”). Research building trades (search “construction industry”). Wear proper attire in the workshop.</td>
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<tr>
<td>guardrails, ramps,</td>
<td>hazards.</td>
<td>hand and power tools.</td>
<td></td>
<td>-regs.html</td>
</tr>
<tr>
<td><strong>NJ CTE STANDARDS</strong></td>
<td>Interpreting MSDS sheets.</td>
<td><strong>Editorial</strong> Write an article on safety in the workshop.</td>
<td></td>
<td><strong>Video:</strong> <a href="https://www.youtube.com/watch?v=6o3kE3dGaRw">https://www.youtube.com/watch?v=6o3kE3dGaRw</a></td>
</tr>
<tr>
<td>9.3.12.AC 1,3;</td>
<td>Be aware of OSHA.</td>
<td><strong>Close Reading</strong> MSDS sheets. OSHA Policies. Tools manuals</td>
<td></td>
<td><strong>Workshop:</strong> Safety Manuals for the tools. District Safety Manual.</td>
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<tr>
<td>9.3.12.AC-CST 5, 9;</td>
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<tr>
<td><strong>CCTC:</strong></td>
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<tr>
<td>AC 1,3; AC-CST 5,9;</td>
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<tr>
<td><strong>CCSS:</strong></td>
<td></td>
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<tr>
<td>RL.9-10.1; RI.9-10.5; SL.9-10.1</td>
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<tr>
<td>1.3. Demonstrate the safe use of Ladders &amp; Scaffolding.</td>
<td>How safe is the ladder? What is the safe rating of ladders?</td>
<td>Identifying ladder capacity ratings. identifying proper ladder angle and base.</td>
<td>Online Interpret ladder ratings. apply ladder ratings for specific ladders.</td>
<td><strong>Video:</strong> <a href="https://www.youtube.com/watch?v=HKytKZ3P33k">https://www.youtube.com/watch?v=HKytKZ3P33k</a></td>
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<td><strong>Why are there so many designs to buildings?</strong>  <strong>Does a building design influence its structural integrity?</strong></td>
<td>Applying fall protection devices always for climbing. Properly set up and climb/descend an extension ladder, demonstrating proper 3-point contact.</td>
<td><strong>Library</strong>  Integrate IDEA (disability).  <strong>VIDEOS:</strong>  Show workshop video on ladder and scaffolding use.  Fall protection in action. Practical use of ladders in shop</td>
<td><strong>Workshop:</strong>  Safety Manuals for the ladders and scaffoldings.  <strong>Online:</strong>  <a href="http://home.howstuffworks.com/home-improvement/household-safety/tips/home-repair-safety-tips.htm">http://home.howstuffworks.com/home-improvement/household-safety/tips/home-repair-safety-tips.htm</a></td>
</tr>
<tr>
<td>1.4. analyze the design of residential buildings. <strong>NJ CTE STANDARDS</strong> 9.3.12.AC 6; 9.3.12.AC-CST 6; 9.3.12.AC-DES 1,8; 9.3.12.AC-MO.1,6; <strong>CCTC:</strong> AC 1,7; AC-CST 7; AC-DES 1,8; AC-MO1,6;</td>
<td><strong>Identifying designs of residential buildings.</strong>  <strong>applying the codes, laws and rules to these designs.</strong></td>
<td><strong>Workshop</strong>  Read text on Building Trades-“Carpentry” by Leonard Koel.  Be familiar with residential symbols in blueprints and drawings.</td>
<td><strong>Library</strong>  NCCER Core Curriculum: Introductory Craft Skills.  Trainee Guide 5th Edition. NCCER.  Pearson.  <strong>Online</strong>  NCCER Carpentry I 5th Edition.  Pearson.  Carpentry by Leonard Koel.</td>
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<td><strong>CCSS:</strong> RL.9-10.1; Ri.9-10.5; SL.9-10.1</td>
<td></td>
<td></td>
<td>building industry (specific to municipalities).</td>
<td>Video: Building structure: <a href="https://www.youtube.com/watch?v=Md0BaiK98fU">https://www.youtube.com/watch?v=Md0BaiK98fU</a></td>
</tr>
<tr>
<td><strong>MATH:</strong> N.Q.A.1-3.</td>
<td></td>
<td></td>
<td>Research building trades.</td>
<td>Building codes: <a href="https://www.youtube.com/watch?v=Kk358ZZa8pk">https://www.youtube.com/watch?v=Kk358ZZa8pk</a></td>
</tr>
<tr>
<td><strong>NJ CTE STANDARDS</strong> 9.3.12.AC 6; 9.3.12.AC-CST 6; 9.3.12.AC-DES 1,8; 9.3.12.AC-MO.1,6;</td>
<td>Why are there so many designs to buildings? Does a building design influence its structural integrity? What are the comparison of the design and structure of a residential building and a commercial one?</td>
<td>Identifying the designs of commercial buildings. Explaining the codes, laws and rules of these designs.</td>
<td><strong>Workshop</strong> Read text on Building Trades-&quot;Carpentry&quot; by Leonard Koel. Be familiar with residential symbols in blueprints and drawings. <strong>Online</strong> Research building codes and laws associated with</td>
<td><strong>Library.</strong> Carpentry by Leonard Koel. <strong>Video:</strong> Youtube videos on the &quot;structure of residential buildings&quot;. <strong>Video:</strong> Building structure: <a href="https://www.youtube.com/watch?v=Md0BaiK98fU">https://www.youtube.com/watch?v=Md0BaiK98fU</a></td>
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<tr>
<td>CCSS: RL.9-10.1; RI.9-10.5; SL.9-10.1</td>
<td>What are the trades associated with the construction industry?</td>
<td>Identifying the trades that are exist in the building industry.</td>
<td>building industry (specific to municipalities). Research building trades.</td>
<td>Building codes: <a href="https://www.youtube.com/watch?v=Kk358ZZa8pk">https://www.youtube.com/watch?v=Kk358ZZa8pk</a></td>
</tr>
<tr>
<td>MATH: N.Q.A.1-3.</td>
<td>How to obtain certification in each specialty area?</td>
<td>Coordinating work between trades.</td>
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<td>Construction: <a href="https://www.youtube.com/watch?v=mvHGCrGKuLk">https://www.youtube.com/watch?v=mvHGCrGKuLk</a></td>
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<td></td>
<td></td>
<td><a href="https://www.youtube.com/watch?v=xTiqFF9MjLA">https://www.youtube.com/watch?v=xTiqFF9MjLA</a></td>
</tr>
</tbody>
</table>

### Unit Vocabulary

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Accident</td>
<td>OSHA- an unplanned event that results in personal injury or property damage.</td>
</tr>
<tr>
<td>Combustible</td>
<td>Capable of easily igniting and rapidly burning.</td>
</tr>
<tr>
<td>Competent person</td>
<td>A person capable of identifying and predicting existing hazards.</td>
</tr>
<tr>
<td>Confined space</td>
<td>A work area large enough for a person to work in, but with limited means of entry and exit and not designed for continuous occupancy. Ex tanks, pits, vaults.</td>
</tr>
<tr>
<td>Cross bracing</td>
<td>Braces placed diagonally from the bottom of one rail to the tip of another rail to add support to a structure.</td>
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<tr>
<td>excavation</td>
<td>Any man-made cut, cavity trench or depression in an earth surface, formed by removing earth. Ex basement.</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
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</tr>
<tr>
<td>flammable</td>
<td>Capable of easily igniting and rapidly burning. Ex fuel</td>
</tr>
<tr>
<td>flash burn</td>
<td>The damage that can be done to eyes after even brief exposure to ultraviolet light from arc welding.</td>
</tr>
<tr>
<td>flash point</td>
<td>The temperature at which fuel gives off enough gases to burn.</td>
</tr>
<tr>
<td>ground</td>
<td>The conducting connection between electrical equipment or an electrical circuit and the earth.</td>
</tr>
<tr>
<td>GFCI</td>
<td>Ground Fault circuit interrupter is a device that interrupts and de-energizes an electrical circuit to protect a person from electrocution.</td>
</tr>
<tr>
<td>Guarded</td>
<td>An enclosed fenced, covered or otherwise protected by barriers, rails covers or platforms to prevent dangerous contact.</td>
</tr>
<tr>
<td>Hard line</td>
<td>A line attached to a tool or object so a worker can pull it up after climbing a ladder or scaffold.</td>
</tr>
<tr>
<td>Hazcom</td>
<td>Hazard Communication standard: the standard that requires contractors to educate employees about hazardous chemicals on the job site and how to work with them safely.</td>
</tr>
<tr>
<td>Incident</td>
<td>OSHA-an unplanned event that does not result in personal injury but may result in property damage or is worthy of recording.</td>
</tr>
<tr>
<td>Lanyard</td>
<td>A short section of rope or strap, one end of which is attached to a worker’s safety harness and the other to a strong anchor point above the work area.</td>
</tr>
<tr>
<td>Lockout/tagout</td>
<td>A formal procedure for taking equipment out of service and</td>
</tr>
<tr>
<td>Term</td>
<td>Definition/Explaination</td>
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<tr>
<td>Management system</td>
<td>The organization of a company’s management, including reporting procedures, supervisory responsibility, and administration.</td>
</tr>
<tr>
<td>Maximum intended load</td>
<td>The total weight of all people, equipment, tools, materials, and loads that a ladder can hold at one time.</td>
</tr>
<tr>
<td>Midrail</td>
<td>Mid-level, horizontal board required on all open sides of scaffolds and platforms that are more than 14 inches (35cms) from the face of the structure and more than 10 feet (3.05m) above ground. It is placed halfway between the toeboard and the top rail.</td>
</tr>
<tr>
<td>OSHA</td>
<td>Occupational Safety and Health Administration: an agency of the US Department of Labor.</td>
</tr>
<tr>
<td>Permit-required confined space</td>
<td>A confined space that has been evaluated and have been found to have actual or potential hazards, such as a toxic atmosphere or other serious safety or health hazard. Workers need written authorization to enter a permit-required confined space.</td>
</tr>
<tr>
<td>Personal protective equipment (PPE)</td>
<td>Equipment or clothing designed to prevent or reduce injuries.</td>
</tr>
<tr>
<td>Planked</td>
<td>Having pieces of material 2 inches (5 cms) thick or greater and 6 inches wide or greater used as flooring, decking or scaffold decks.</td>
</tr>
<tr>
<td>Pneumatic</td>
<td>Powered by air pressure, such as a pneumatic tool.</td>
</tr>
<tr>
<td>Proximity work</td>
<td>Work done near a hazard but not actually in contact with it.</td>
</tr>
<tr>
<td>Qualified person</td>
<td>A person who, by possession of a recognized degree, certificate or...</td>
</tr>
<tr>
<td>Term</td>
<td>Definition</td>
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<tr>
<td>Respirator</td>
<td>A device that provides clean, filtered air for breathing, not matter what is in the surrounding air.</td>
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<tr>
<td>Safety culture</td>
<td>The culture created when the whole company sees the value of a safe work environment.</td>
</tr>
<tr>
<td>Safety date sheet (SDS)</td>
<td>A document that must accompany any hazardous substance. The SDS identifies the substance and give the exposure limits, the physical and chemical characteristics, the kind of hazard it presents precautions for safe handling and use, and specific control measures.</td>
</tr>
<tr>
<td>Scaffold</td>
<td>An elevated platform for workers and materials.</td>
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<tr>
<td>Shielding</td>
<td>A structure used to protect workers in trenches but lacking the ability to prevent cave-ins.</td>
</tr>
<tr>
<td>Shoring</td>
<td>Using pieces of timber, usually in a diagonal position, to hold a wall in place temporarily.</td>
</tr>
<tr>
<td>Signaler</td>
<td>A person who is responsible for directing a vehicle when the driver's vision is blocked.</td>
</tr>
<tr>
<td>Spoil</td>
<td>Materials such as earth removed while digging a trench or excavation.</td>
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</tbody>
</table>
| Toeboard              | A vertical barrier at floor level attached along exposed edge of a platform, runway, or ream to prevent materials and people from...
<table>
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<tr>
<th>Top rail</th>
<th>A top level, horizontal board required on all open sides of scaffolds and platforms that are more than 14 inches (36cms) from the face of the structure and more than 10 feet (3m) above ground.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trench</td>
<td>A narrow excavation made below the surface of the ground that is generally deeper than it is wide with a maximum width of 15 feet (4.6 m).</td>
</tr>
<tr>
<td>Welding curtain</td>
<td>A protective screen set up around a welding operation designed to safeguard workers not directly involved in that operation.</td>
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<tr>
<td>Wind sock</td>
<td>A cloth cone open at both ends mounted in a high place to show which direction the wind is blowing.</td>
</tr>
</tbody>
</table>

**Suggested Unit Projects**

Students will be able to build small projects such as jewelry box, wall shelves, small cabinets, tables and tool boxes

**Suggested Structured Learning Experiences**

At least one District approved site visit to a construction site.