Cabinetmaking I

8604 36 weeks / 140 hours

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Acknowledgments

The components of this instructional framework were reviewed by the following business panel team members:

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The following educators served on the curriculum development team:

Anthony Pawlowski, Virginia Beach Technical and Career Education Center, Virginia Beach City Public Schools
Phillip Simmons, Botetourt Technical Education Center, Botetourt County Public
Course Description

Suggested Grade Level: 10 or 11

Students learn workshop and tool safety and employability skills as they practice reading plans; estimating and selecting materials; cutting and shaping stock; assembling, fastening, and installing components; and finishing surfaces. The technical, problem-solving, leadership, and creative skills learned in Cabinetmaking can be applied in industries well beyond construction trades and professions and can prepare the student for lifelong learning and success.

As noted in Superintendent's Memo #058-17 (2-28-2017), this Career and Technical Education (CTE) course must maintain a maximum pupil-to-teacher ratio of 20 students to one teacher, due to safety regulations. The 2016-2018 biennial budget waiver of the teacher-to-pupil ratio staffing requirement does not apply.

Task Essentials List

- Tasks/competencies designated by plus icons (⊕) in the left-hand column(s) are essential
- Tasks/competencies designated by empty-circle icons (○) are optional
- Tasks/competencies designated by minus icons (⊖) are omitted
- Tasks marked with an asterisk (*) are sensitive.
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<thead>
<tr>
<th>Task Number</th>
<th>8604</th>
<th>Tasks/Competencies</th>
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<tbody>
<tr>
<td><strong>Applying Basic Construction Safety Standards (Core Safety)</strong></td>
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<tr>
<td>39</td>
<td>+</td>
<td>Comply with federal, state, and local safety legal requirements, including OSHA, VOSHA, and EPA.</td>
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<td>40</td>
<td>+</td>
<td>Identify personal protective equipment (PPE) requirements.</td>
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<td>41</td>
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<td>Inspect and maintain a safe working environment.</td>
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<tr>
<td>42</td>
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<td>Explain safe working practices around electrical hazards.</td>
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<tr>
<td>43</td>
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<td>Identify emergency first-aid procedures.</td>
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<td>44</td>
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<td>Identify the types of fires and the methods used to extinguish them.</td>
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<tr>
<td>45</td>
<td>+</td>
<td>Inspect course-specific hand and power tools to visually identify defects.</td>
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<td>46</td>
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<td>Demonstrate safe operation of course-specific hand and power tools.</td>
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<td>47</td>
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<td>Demonstrate lifting and carrying techniques.</td>
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<td>Demonstrate safe laddering techniques.</td>
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<tr>
<td>49</td>
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<td>Report injuries.</td>
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<tr>
<td>50</td>
<td>+</td>
<td>Report personal, environmental, and equipment safety violations to the appropriate authority.</td>
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<td>51</td>
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<td>Earn the OSHA 10 card.</td>
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<td>52</td>
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<td>Pass safety exam.</td>
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<td><strong>Performing Basic Cabinetmaking Skills</strong></td>
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<td>53</td>
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<td>Check stock and assemblies for squareness.</td>
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<tr>
<td>54</td>
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<td>Measure materials.</td>
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<td>Determine levelness and plumbness of surfaces, using a level.</td>
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<tr>
<td>56</td>
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<td>Store materials.</td>
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<td>Select materials.</td>
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<td>Identify hand and power tools commonly used in cabinetmaking.</td>
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<td>59</td>
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<td>Maintain hand tools.</td>
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<td>60</td>
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<td>Describe the safe use of power-driven fastening equipment.</td>
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<td>Identify the benefits of the major woods and wood products used in cabinetmaking.</td>
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<tr>
<td>62</td>
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<td>Distinguish among popular applications of cabinets in residential and commercial installation.</td>
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**Cutting and Shaping Stock**

<table>
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<tr>
<td>63</td>
<td>+</td>
<td>Cut stock to size +/- 1/8 inch.</td>
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<tr>
<td>64</td>
<td>+</td>
<td>Bore holes.</td>
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<tr>
<td>65</td>
<td>+</td>
<td>Cut butt joint.</td>
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<tr>
<td>66</td>
<td>+</td>
<td>Make a doweled joint.</td>
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<td>67</td>
<td>+</td>
<td>Cut miter joint.</td>
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<td>68</td>
<td>+</td>
<td>Cut biscuit joint.</td>
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<td>69</td>
<td>+</td>
<td>Cut lap joint.</td>
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<tr>
<td>70</td>
<td>+</td>
<td>Join edges of stock.</td>
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<td>71</td>
<td>+</td>
<td>Surface face of stock.</td>
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<tr>
<td>72</td>
<td>+</td>
<td>Describe how computer numeric control (CNC) technology is used for cutting and shaping operations.</td>
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<td><strong>Assembling, Fastening, and Installing Components</strong></td>
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<tr>
<td>73</td>
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<td>Apply clamping devices for basic joinery.</td>
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<td>Assemble face frames, using pocket joinery.</td>
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<td>75</td>
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<td>Fasten stock with metal fasteners.</td>
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<td>76</td>
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<td>Glue boards edge to edge.</td>
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<td><strong>Interpreting Plans</strong></td>
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<td>77</td>
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<td>Identify the drawings in a complete set of plans.</td>
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<td>Identify dimensions from a plan.</td>
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<td>Perform calculations, using architectural dimensions.</td>
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<td>Interpret scale.</td>
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<td>Describe how CAD is used in cabinet fabrication.</td>
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<td>82</td>
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<td>Determine materials from a plan.</td>
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<td>Determine use of materials.</td>
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<td><strong>Finishing Surfaces</strong></td>
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<td>Apply safety rules when using finishing materials.</td>
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<td>Remove excess glue.</td>
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<td>86</td>
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<td>Apply wood filler to nail or screw holes.</td>
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<tr>
<td>87</td>
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<td>Sand surfaces.</td>
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<tr>
<td>88</td>
<td>+</td>
<td>Clean surfaces.</td>
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</tbody>
</table>
Curriculum Framework

Applying Basic Construction Safety Standards (Core Safety)

Task Number 39

Comply with federal, state, and local safety legal requirements, including OSHA, VOSHA, and EPA.

Definition

Compliance should include the identification of the Hazard Communication Standard, the information included on Safety Data Sheets, and the responsibilities of employers and employees under Hazard Communication regulation.

Process/Skill Questions

- Where should hazardous materials be stored?
- What information can be found on a Safety Data Sheet (SDS)?

Common Career Technical Core

AC-CST5
Apply practices and procedures required to maintain jobsite safety.

AC3
Comply with regulations and applicable codes to establish and manage a legal and safe workplace.

Task Number 40

Identify personal protective equipment (PPE) requirements.
Definition

Identification should include procedures for inspecting, wearing, and removing

- eye protection
- respirator
- hard hat
- gloves
- safety harness
- hearing protection
- safety shoes.

Process/Skill Questions

- What are some dangerous effects of sun exposure, and how can these risks be significantly diminished?
- Why is wearing jewelry prohibited while in the lab or on the job site?

Common Career Technical Core

AC-CST5
Apply practices and procedures required to maintain jobsite safety.

AC3
Comply with regulations and applicable codes to establish and manage a legal and safe workplace.

NCCER Standards

Core Curriculum: Introductory Craft Skills

- 00101-04 Basic Safety

Task Number 41

Inspect and maintain a safe working environment.

Definition

Inspection and maintenance should be ongoing and should result in identifying potential hazards on a job site or in the lab, such as unstable or improperly erected scaffolding, electrical hazards,
job-site debris, improperly stored materials, and air quality hazards and when present, must be remedied by appropriate measures and comply with school and instructor guidelines.

**Process/Skill Questions**

- What are some examples of job-site hazards?
- Why is it important to use good housekeeping standards on a job site?
- Why is it important to store materials and tools in their proper places?

**Common Career Technical Core**

**AC-CST5**
Apply practices and procedures required to maintain jobsite safety.

**AC3**
Comply with regulations and applicable codes to establish and manage a legal and safe workplace.

**NCCER Standards**

*Core Curriculum: Introductory Craft Skills*

- 00101-04 Basic Safety

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**Task Number 42**

**Explain safe working practices around electrical hazards.**

**Definition**

Explanation should include

- identifying equipment used to test electrical circuits
- describing safe working conditions
- demonstrating safe work habits

according to industry standards and instructor's guidelines.

**Process/Skill Questions**

- What is the definition of *proximity work*?
- What are safe working clearances according to the National Electric Code (NEC)?
- What are some examples of safe working conditions and safe working habits?
- What is the unseen hazard with electrical work?

**Common Career Technical Core**

**AC-CST5**  
Apply practices and procedures required to maintain jobsite safety.

**AC-CST9**  
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

**AC3**  
Comply with regulations and applicable codes to establish and manage a legal and safe workplace.

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**Task Number 43**

**Identify emergency first-aid procedures.**

**Definition**

Identification should include first-aid procedures for accidents involving

- bodily fluids
- electrical injuries
- eye injuries
- falls
- burns

according to standard first-aid and school policies.

**Process/Skill Questions**

- What are the steps that should be followed in the event of an accident?
- Why is knowing CPR an important skill within the building trades?
- Why is it important to be certified to administer first aid?
- What are the different classifications (degrees) of electrical burns?

**Common Career Technical Core**

**AC-CST5**  
Apply practices and procedures required to maintain jobsite safety.

**AC3**  
Comply with regulations and applicable codes to establish and manage a legal and safe workplace.
Task Number 44

Identify the types of fires and the methods used to extinguish them.

Definition

Identification should include the classifications of fires (A, B, C, D, and K), causes and prevention of fires, types of extinguishers, and, when possible, the demonstrated use of a fire extinguisher, in accordance with government regulations and instructor guidelines.

Process/Skill Questions

- Why do fires have different classifications, and what are they?
- What is the fire triangle?
- What are the three things necessary to start a fire?
- Why is it important to know the classification of a fire when trying to extinguish it?
- Why and how often should extinguishers be inspected?
- What are the classifications of extinguishers?

Common Career Technical Core

AC-CST5
Apply practices and procedures required to maintain jobsite safety.

AC3
Comply with regulations and applicable codes to establish and manage a legal and safe workplace.

Task Number 45

Inspect course-specific hand and power tools to visually identify defects.

Definition

Inspection of power tools should include

- identifying components of machinery (e.g., guards, blades, moving parts, start/stop switches, cords)
• identifying standard safety procedures (i.e., shop practices, manufacturer's recommendations)
• observing a demonstration of the safe operation and use of each piece of machinery in the shop.

Inspection of hand tools should include identification of tool defects.

Process/Skill Questions

• What are some of the basic power tools used in construction?
• What actions should be taken before using a power circular saw?
• Why should a power tool always be grounded?

Common Career Technical Core

AC-CST5
Apply practices and procedures required to maintain jobsite safety.

AC-CST9
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

NCCER Standards

Core Curriculum: Introductory Craft Skills

  o 00103-04 Introduction to Hand Tools
  o 00104-04 Introduction to Power Tools

Carpentry Fundamentals: Level 1

  o 27103-06 Hand and Power Tools

Cabinetmaking

  o 27501-03 Cabinetmaking

Task Number 46
Demonstrate safe operation of course-specific hand and power tools.

Definition

Demonstration should include following safety procedures according to manufacturer’s operating instructions, as well as all other applicable safety standards.

Process/Skill Questions

- What are some common hand tools used in cabinetmaking?
- What are some common power tools used in cabinetmaking?

Common Career Technical Core

AC-CST5
Apply practices and procedures required to maintain jobsite safety.

AC-CST9
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

Task Number 47

Demonstrate lifting and carrying techniques.

Definition

Demonstration should include lifting and carrying materials and equipment based on the principles of

- lifting with legs
- keeping back straight
- holding load close to the body
- getting help, if necessary

in accordance with government regulations and instructor's guidelines.

Process/Skill Questions

- What are common injuries associated with improper lifting techniques?
- What can one do to prevent injury?
- How does proper positioning affect proper technique?
Common Career Technical Core

AC-CST5
Apply practices and procedures required to maintain jobsite safety.

AC-CST9
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

NCCER Standards

Core Curriculum: Introductory Craft Skills

- 00101-04 Basic Safety

Task Number 48

Demonstrate safe laddering techniques.

Definition

Demonstration should include using appropriate conduct and safety procedures while using ladders (e.g., three-point contact), while carrying ladders (e.g., two people at all times), and while erecting and setting ladders. Identification of additional ladder types may include

- special purpose ladders (e.g., "A" ladder, folding ladder, pompier ladder)
- aluminum ladder
- fiberglass ladder

and the parts and safety features of each.

Process/Skill Questions

- Why are ladders rated for certain weights?
- Why is the apex of a stepladder not considered a step?

Common Career Technical Core

AC-CST5
Apply practices and procedures required to maintain jobsite safety.

AC-CST9
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

Task Number 49

Report injuries.

Definition

Report should include an immediate oral statement of the job-related or non-job-related injury to the instructor or supervisor, and may be followed by a written confirmation reporting the date, extent of injury, and circumstances of the accident.

Process/Skill Questions

- Why is it important to report injuries?
- What are common reporting procedures?
- Why is it important to report an injury promptly? Before leaving the job site?
- What is worker's compensation?
- What are the key components of a report?

Common Career Technical Core

AC-CST5
Apply practices and procedures required to maintain jobsite safety.

AC3
Comply with regulations and applicable codes to establish and manage a legal and safe workplace.

Task Number 50

Report personal, environmental, and equipment safety violations to the appropriate authority.

Definition

Report should include an oral or written statement identifying the violation and the date it was observed and should be given to the instructor, supervisor, or the local OSHA inspectors.

Process/Skill Questions
• What ethical considerations might be involved when reporting coworkers?
• Why is it important to follow reporting procedures?
• What is liability?

Common Career Technical Core

AC-CST5
Apply practices and procedures required to maintain jobsite safety.

AC3
Comply with regulations and applicable codes to establish and manage a legal and safe workplace.

Task Number 51

Earn the OSHA 10 card.

Definition
Earning an OSHA 10 card will

• recognize that one has acquired 10 hours of safety instruction
• help teach national standards for personal safety within a lab environment
• validate safety skills to the industry
• help workers become more safety conscious and responsible.

Process/Skill Questions

• What are the benefits of earning the OSHA 10 card?
• What is OSHA and how are its standards validated?
• Why was OSHA established and how has it evolved?

Common Career Technical Core

AC3
Comply with regulations and applicable codes to establish and manage a legal and safe workplace.

NCCER Standards

Core Curriculum: Introductory Craft Skills

00101-04 Basic Safety
Task Number 52

Pass safety exam.

Definition

Assessment must measure participation in safety training programs, including attending safety meetings and completing periodic demonstration of knowledge and skills gained from program topics (e.g., interpretation of Safety Data Sheets).

Process/Skill Questions

- How often should one participate in safety training programs? Why?
- How does insurance impact the requirement of continuous retraining for safety?

Common Career Technical Core

AC3
Comply with regulations and applicable codes to establish and manage a legal and safe workplace.

Performing Basic Cabinetmaking Skills

Task Number 53

Check stock and assemblies for squareness.

Definition

Checking should include testing stock and/or assemblies for a variety of applications to detect deviation from a right angle, a straight line, or a plane surface.

Process/Skill Questions

- What tools can be used to check for squareness?
- What method can be used to determine if a cabinet frame is square?
- How can the corner of a room be checked for squareness?

Common Career Technical Core
AC-CST3
Implement testing and inspection procedures to ensure successful completion of a construction project.

NCCER Standards

Cabinetmaking

- 27501-03 Cabinetmaking

Task Number 54

Measure materials.

Definition

Measuring should include using a tape measure or other tools and marking selected stock.

Process/Skill Questions

- What is the smallest measurement on most tapes used in cabinetmaking?
- What lengths of tapes are commonly used in cabinetmaking?
- What are examples of other measuring tools used in cabinetmaking?

Common Career Technical Core

AC1
Use vocabulary, symbols and formulas common to architecture and construction.

Task Number 55

Determine levelness and plumbness of surfaces, using a level.

Definition

Determination should include

- checking horizontal surface for levelness
- checking vertical surface for plumbness
- reading a level and noting if the bubble is off center.
Process/Skill Questions

- What is the difference between level and plumb?
- What are the different lengths of levels used?
- What are the possible consequences of failing to determine levelness and plumbness of surfaces?

Common Career Technical Core

AC-CST3
Implement testing and inspection procedures to ensure successful completion of a construction project.

Task Number 56

Store materials.

Definition

Storage should include

- demonstrating safe and proper procedures in lifting, carrying, and stacking materials
- considering environmental factors such as humidity, light, and physical restrictions
- applying personal safety precautions.

Process/Skill Questions

- How is lumber affected by extended exposure to weather?
- Where should flammable materials be stored?

Common Career Technical Core

AC-CST9
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

NCCER Standards

Carpentry Fundamentals: Level 1

- 27102-06 Building Materials, Fasteners, and Adhesives
Task Number 57

Select materials.

Definition

Selection should include materials such as various types of plywood, lumber, fasteners, adhesives, and millwork.

Process/Skill Questions

- What is the purpose of the grade stamp on materials?
- Why is two-by material actually 1½ inches thick?

Common Career Technical Core

AC-CST7
Compare and contrast the building systems and components required for a construction project.

NCCER Standards

Carpentry Fundamentals: Level 1

- 27102-06 Building Materials, Fasteners, and Adhesives

Cabinetmaking

- 27501-03 Cabinetmaking

Task Number 58

Identify hand and power tools commonly used in cabinetmaking.

Definition
Identification should include

- hammers
- screwdrivers
- ripping bars and nail pullers
- wrenches
- pliers
- wire cutters
- spirit, electronic, and laser levels
- squares
- measuring tools
- vises
- clamps
- saws
- files and rasps
- chisels
- plumb bobs
- sockets and ratchets
- utility knives
- power drills
- grinders and sanders.

**Process/Skill Questions**

- How would you describe the proper, safe use of various hand tools used in cabinetmaking?
- How would you describe the proper, safe use of various power tools used in cabinetmaking?

**Common Career Technical Core**

**AC-CST9**
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

---

**Task Number 59**

**Maintain hand tools.**

**Definition**

Maintenance should include adjustment and replacement of blades and bits.

**Process/Skill Questions**
• Why is it important to maintain a sharp edge on cutting tools?
• How is a set put into a handsaw?
• Why must tools be kept clean?

Common Career Technical Core

AC-CST9
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

NCCER Standards

Cabinetmaking

• 27501-03 Cabinetmaking

Task Number 60

Describe the safe use of power-driven fastening equipment.

Definition

Description should include

• identifying safety features of power-driven fastening equipment
• wearing PPE
• following established procedures
• reporting injuries.

Process/Skill Questions

• What are the most common types of injuries associated with power-driven fastening equipment? How do they occur?
• How can injuries associated with power-driven fastening equipment be prevented?

Common Career Technical Core

AC-CST9
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.
Task Number 61

Identify the benefits of the major woods and wood products used in cabinetmaking.

Definition

Identification includes the benefits of each of the following:

- Hardwood (i.e., oak, maple, cherry, birch)—sturdy, used for structural members
- Softwood—ease of use, potential cost savings
- Plywood (including luan)—specialty veneers available, potential cost savings
- MDF (medium density fiberboard)—potential cost savings
- Melamine—durable, prefinished

Process/Skill Questions

- What are the differences between a conifer and a deciduous tree?
- What is melamine?
- When is hardwood a better choice than melamine?
- When is plywood a better choice than solid wood?

Common Career Technical Core

AC-CST7
Compare and contrast the building systems and components required for a construction project.

Task Number 62

Distinguish among popular applications of cabinets in residential and commercial installation.

Definition

Distinction should include various applications in residential cabinetry (e.g., mudroom, home office, garage, kitchen, bath) and commercial cabinetry (e.g., warehouse, medical office, retail space, restaurant) and the relative importance of factors such as strength, appearance, cleanliness, and/or cost for each.

Process/Skill Questions

- Why might you use plastic laminate cabinets in a commercial application?
• Why might you use wooden cabinets more often in residential applications than commercial ones?

Common Career Technical Core

AC-CST7
Compare and contrast the building systems and components required for a construction project.

AC-CST9
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

Cutting and Shaping Stock

Task Number 63

Cut stock to size +/- 1/8 inch.

Definition

Cutting to size should include marking the length and cutting to within specifications +/- 1/8 inch.

Process/Skill Questions

• What is the difference between rip and crosscut?
• What type of blade would be best to rip and crosscut stock? Why?
• Why change blades?

Common Career Technical Core

AC-CST8
Demonstrate the construction crafts required for each phase of a construction project.

AC-CST9
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

Task Number 64

Bore holes.

Definition
Boring holes should include hole diameter and location according to specifications.

**Process/Skill Questions**

- What are the types of wood drill bits? How are they different?
- What type of bit could be used to make a flat bottom hole? Why?
- What feature determines the size of a portable drill?

**Common Career Technical Core**

**AC-CST8**
Demonstrate the construction crafts required for each phase of a construction project.

**AC-CST9**
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

---

**Task Number 65**

**Cut butt joint.**

**Definition**

Cut should be made to 90 degrees, forming a joint in which the square end of one piece fits against the surface or edge of another piece.

**Process/Skill Questions**

- What are the different machines that can make the cuts for butt joints?
- What are the benefits and drawbacks of butt joints?
- Can you use one saw for a butt joint? Why, or why not?

**Common Career Technical Core**

**AC-CST8**
Demonstrate the construction crafts required for each phase of a construction project.

**AC-CST9**
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

**NCCER Standards**

**Cabinetmaking**
Task Number 66

Make a doweled joint.

Definition

Making a doweled joint should include selecting the diameter of the dowel, cutting the length of the dowel, boring holes, applying glue to dowels and holes, and inserting dowels.

Process/Skill Questions

• What are the different machines that can make a doweled joint?
• What are the benefits and drawbacks of doweled joints?
• Where are you likely to find examples of doweled joints?

Common Career Technical Core

AC-CST8
Demonstrate the construction crafts required for each phase of a construction project.

AC-CST9
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

NCCER Standards

   Cabinetmaking

   ○ 27501-03 Cabinetmaking

Task Number 67

Cut miter joint.

Definition
Cutting a miter joint should include marking and making the cut at the correct angle in the material.

**Process/Skill Questions**

- What degree cut is made to make most miter joints?
- What tools would you use to cut miter joints?
- How would you cut a compound miter cut?

**Common Career Technical Core**

AC-CST8
Demonstrate the construction crafts required for each phase of a construction project.

AC-CST9
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

**NCCER Standards**

Carpentry: Level 3
- 27310-02 Interior Finish Three: Window, Door, Floor, and Ceiling Trim

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**Task Number 68**

**Cut biscuit joint.**

**Definition**

Cutting a biscuit joint should include marking the pieces to be joined, aligning the cutting tool, and making the cut.

**Process/Skill Questions**

- What are the different machines that can make cuts for biscuit joints?
- What are the benefits and drawbacks of biscuit joints?
- Where are you likely to find examples of biscuit joints?

**Common Career Technical Core**
AC-CST8
Demonstrate the construction crafts required for each phase of a construction project.

AC-CST9
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

NCCER Standards

Cabinetmaking

- 27501-03 Cabinetmaking

Task Number 69

Cut lap joint.

Definition

Cutting a lap joint should include measuring, marking, and removing material from both of the pieces to be joined.

Process/Skill Questions

- What are the different machines that can make cuts for lap joints?
- What are the benefits and drawbacks of lap joints?
- Where are you likely to find examples of lap joints?

Common Career Technical Core

AC-CST8
Demonstrate the construction crafts required for each phase of a construction project.

AC-CST9
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

NCCER Standards

Cabinetmaking

- 27501-03 Cabinetmaking
Task Number 70

Join edges of stock.

Definition

Joining edges should include using a joiner or hand plane to produce a square, straight, and smooth edge.

Process/Skill Questions

- What are the safety concerns when using a joiner?
- Why is it preferable to use a joiner instead of a planer to flatten the surface?
- What are the three results achieved by using the joiner?

Common Career Technical Core

AC-CST8
Demonstrate the construction crafts required for each phase of a construction project.

AC-CST9
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

NCCER Standards

   Cabinetmaking
      o 27501-03 Cabinetmaking

Task Number 71

Surface face of stock.

Definition

Surfacing should include using a planer or hand plane to smooth stock to a required thickness.

Process/Skill Questions
• How does grain direction and feed direction affect surfacing stock?
• How does feed rate affect surfacing stock?
• What is the main reason for using a thickness planer?

Common Career Technical Core

AC-CST8
Demonstrate the construction crafts required for each phase of a construction project.

AC-CST9
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

Task Number 72

Describe how computer numeric control (CNC) technology is used for cutting and shaping operations.

Definition

Description should include such uses as cutting, milling, and routing parts, as designed by a computer-aided design (CAD) operator.

Process/Skill Questions

• Why is CNC technology becoming more widely used in commercial cabinet applications?
• What must a CAD operator know before setting up a CNC operation?

Common Career Technical Core

AC1
Use vocabulary, symbols and formulas common to architecture and construction.

Assembling, Fastening, and Installing Components

Task Number 73

Apply clamping devices for basic joinery.
Definition

Application should include

- identifying the joint to be clamped
- selecting the proper clamp for each application
- protecting the surface where the clamps are applied
- using the proper pressure.

Process/Skill Questions

- Why is clamping pressure important?
- Why is the type of clamp important, and how does one make the selection?
- What are the names of clamps common to the cabinetmaking lab?
- How can a rope and a stick be used as a clamp?

Common Career Technical Core

AC-CST8
Demonstrate the construction crafts required for each phase of a construction project.

AC-CST9
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

NCCER Standards

Carpentry Fundamentals: Level 1

- 27102-06 Building Materials, Fasteners, and Adhesives

Cabinetmaking

- 27501-03 Cabinetmaking

Task Number 74

Assemble face frames, using pocket joinery.

Definition
Assembly should include matching locations of face-frame parts, attaching the pocket joinery jig, boring holes, and inserting and tightening screws.

**Process/Skill Questions**

- When making a pocket joint, what power tool would you use?
- When would a pocket joint be more beneficial than a biscuit joint?
- What fastener is used for a pocket joint? Why?

**Common Career Technical Core**

**AC-CST8**
Demonstrate the construction crafts required for each phase of a construction project.

**AC-CST9**
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

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**Task Number 75**

**Fasten stock with metal fasteners.**

**Definition**

Fastening should include selecting the appropriate fastener and applying it with hand and/or power tools.

**Process/Skill Questions**

- What determines the size of nails?
- What does the gauge of screws mean?

**Common Career Technical Core**

**AC-CST8**
Demonstrate the construction crafts required for each phase of a construction project.

**AC-CST9**
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

**NCCER Standards**

**Carpentry Fundamentals: Level 1**
Task Number 76

Glue boards edge to edge.

Definition

Gluing should include

- jointing the edges
- matching color and grain or pattern
- applying glue
- making the surfaces flush
- clamping.

Process/Skill Questions

- What power machine is essential when gluing boards edge-to-edge?
- What qualities should the edges of the boards have when gluing?
- What are the different types of glues, and how do you determine the best one for your use?
- What other materials can be used to strengthen glue joints?

Common Career Technical Core

AC-CST8
Demonstrate the construction crafts required for each phase of a construction project.

AC-CST9
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

NCCER Standards

Carpentry Fundamentals: Level 1
Interpreting Plans

Task Number 77

Identify the drawings in a complete set of plans.

Definition

Identification should include drawings that illustrate top, front, side, and three-dimensional views.

Process/Skill Questions

- How can drawings be used to create a bill of materials?
- What three basic dimensions are found within a set of drawings? Why are they most important?

Common Career Technical Core

AC1
Use vocabulary, symbols and formulas common to architecture and construction.

AC6
Read, interpret and use technical drawings, documents and specifications to plan a project.

Task Number 78

Identify dimensions from a plan.

Definition

Identification should include locating dimension lines, reading the dimensions, and distinguishing between exterior and interior measurements.

Process/Skill Questions

- How would you find the dimensions of a room if they were not on the plans?
- What actions should be taken if the dimensions on a drawing are found to be incorrect?
- Why is knowing the correct dimensions of a room important when pricing a job?
Common Career Technical Core

AC1
Use vocabulary, symbols and formulas common to architecture and construction.

AC6
Read, interpret and use technical drawings, documents and specifications to plan a project.

NCCER Standards

Core Curriculum: Introductory Craft Skills

- 00105-04 Introduction to Blueprints

Carpentry Fundamentals: Level 1

- 27104-06 Reading Plans and Elevations
- 27105-06 Floor Systems

Cabinetmaking

- 27501-03 Cabinetmaking

Task Number 79

Perform calculations, using architectural dimensions.

Definition

Performing calculations should include

- converting fractions to decimals and decimals to fractions
- identifying rectangles, squares, triangles, and circles
- using basic geometry to determine perimeter, diagonal, circumference, diameter, radius, area, and volume.

Process/Skill Questions
• When building a cabinet, when might one need to convert a fraction to a decimal or a decimal to a fraction?
• Is it easier to multiply a fraction or a decimal? Why?
• What is the process of calculating the hypotenuse of a triangle?
• How many degrees are in each angle of an octagon?

Common Career Technical Core

AC1
Use vocabulary, symbols and formulas common to architecture and construction.

AC6
Read, interpret and use technical drawings, documents and specifications to plan a project.

NCCER Standards

Core Curriculum: Introductory Craft Skills

 o 00105-04 Introduction to Blueprints

Carpentry Fundamentals: Level 1

 o 27104-06 Reading Plans and Elevations

Carpentry: Level 2

 o 27201-01 Reading Plans and Elevations

Cabinetmaking

 o 27501-03 Cabinetmaking

Task Number 80

Interpret scale.

Definition
Interpretation should include a variety of scales (i.e., 1/4", 1/2", 3/4", 1 ½", and 3") to be performed measure-to-scale and scale-to-measurement.

Process/Skill Questions

- What factors determine the scale used on a drawing?
- How many scales are on the scale rule?

Common Career Technical Core

AC1
Use vocabulary, symbols and formulas common to architecture and construction.

AC6
Read, interpret and use technical drawings, documents and specifications to plan a project.

Task Number 81

Describe how CAD is used in cabinet fabrication.

Definition

Description should include the creation and modification of floor plans, perspectives, and three-dimensional drawings.

Process/Skill Questions

- How are three-dimensional drawings produced?
- What are the benefits of using CAD in cabinet fabrication?

Common Career Technical Core

AC1
Use vocabulary, symbols and formulas common to architecture and construction.

AC6
Read, interpret and use technical drawings, documents and specifications to plan a project.

Estimating and Selecting Materials

Task Number 82

Determine materials from a plan.
Definition

Determination should include generating a cutting list from plans, indicating number of pieces, thickness, width, and length.

Process/Skill Questions

- Why would a carpenter need to determine materials from a print?
- Where would one find information about doors and windows on plans?

Common Career Technical Core

AC-CST7
Compare and contrast the building systems and components required for a construction project.

AC6
Read, interpret and use technical drawings, documents and specifications to plan a project.

NCCER Standards

Core Curriculum: Introductory Craft Skills

- 00105-04 Introduction to Blueprints

Carpentry Fundamentals: Level 1

- 27102-06 Building Materials, Fasteners, and Adhesives
- 27104-06 Reading Plans and Elevations
- 27105-06 Floor Systems

Cabinetmaking

- 27501-03 Cabinetmaking

Task Number 83

Determine use of materials.
Definition

Determination should include identifying common material defects and appropriate material for a given project.

Process/Skill Questions

- What are some of the problems that can arise when the proper material is not used?
- How do local and state building codes affect the use of some materials?

Common Career Technical Core

AC-CST7
Compare and contrast the building systems and components required for a construction project.

NCCER Standards

Carpentry Fundamentals: Level 1

- 27102-06 Building Materials, Fasteners, and Adhesives

Cabinetmaking

- 27501-03 Cabinetmaking

Finishing Surfaces

Task Number 84

Apply safety rules when using finishing materials.

Definition

Application should include

- reading the SDS for the material being used
- wearing PPE, including masks or respirators when necessary
- following manufacturer’s recommendations and warnings
- ventilating the work area
- practicing good housekeeping
• storing and disposing of materials and tools that aid the finish process (e.g., rags, strainers).

Process/Skill Questions

• What types of finishing materials can create a fire hazard?
• What types of personal protective safety equipment are required when using finishing materials?
• What are the consequences of inhaling or being overexposed to finishing materials?

Common Career Technical Core

AC-CST9
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

AC3
Comply with regulations and applicable codes to establish and manage a legal and safe workplace.

NCCER Standards

Carpentry Fundamentals: Level 1

  o 27102-06 Building Materials, Fasteners, and Adhesives

Task Number 85

Remove excess glue.

Definition
Removal should include immediately wiping away excess glue with a clean, damp rag or damp toothbrush for open-grained wood, or letting the glue dry and using a scraper to remove.

Process/Skill Questions

• Why should excess glue be removed?
• How can glue removal extend tool life?
• How does improper or incomplete glue removal affect staining and finishing?
Task Number 86

Apply wood filler to nail or screw holes.

Definition

Application should include covering holes with appropriate wood filler, allowing filler to dry, and sanding to remove any excess filler.

Process/Skill Questions

- What is the purpose of wood filler?
- Is wood filler stainable? Why, or why not?
- How is wood filler applied?

Common Career Technical Core

AC-CST9
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

NCCER Standards

Carpentry Fundamentals: Level 1

- 27102-06 Building Materials, Fasteners, and Adhesives
Task Number 87

Sand surfaces.

Definition

Sanding surfaces should include gradual sanding, starting with a 60-grit to 80-grit paper for solid wood and 120-grit paper for plywood, and finishing with a 220-grit paper.

Process/Skill Questions

- Why are there different grits for sandpaper?
- What is the literal translation of "100-grit" sandpaper?
- How does material determine the selection of sandpaper?

Common Career Technical Core

AC-CST9
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

Task Number 88

Clean surfaces.

Definition

Cleaning should include wiping surfaces with a clean rag or tack cloth, blowing off surfaces, or vacuuming surfaces.

Process/Skill Questions

- What are the consequences of doing a poor job cleaning surfaces?
- What are techniques and procedures for cleaning surfaces?
- What is the benefit of using a tack cloth?

Common Career Technical Core

AC-CST9
Safely use and maintain appropriate tools, machinery, equipment and resources to accomplish construction project goals.

### SOL Correlation by Task

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
<th>Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>39</td>
<td>Comply with federal, state, and local safety legal requirements, including OSHA, VOSHA, and EPA.</td>
<td>History and Social Science: GOVT.15</td>
</tr>
<tr>
<td>40</td>
<td>Identify personal protective equipment (PPE) requirements.</td>
<td></td>
</tr>
<tr>
<td>41</td>
<td>Inspect and maintain a safe working environment.</td>
<td></td>
</tr>
<tr>
<td>42</td>
<td>Explain safe working practices around electrical hazards.</td>
<td></td>
</tr>
<tr>
<td>43</td>
<td>Identify emergency first-aid procedures.</td>
<td></td>
</tr>
<tr>
<td>44</td>
<td>Identify the types of fires and the methods used to extinguish them.</td>
<td></td>
</tr>
<tr>
<td>45</td>
<td>Inspect course-specific hand and power tools to visually identify defects.</td>
<td></td>
</tr>
<tr>
<td>46</td>
<td>Demonstrate safe operation of course-specific hand and power tools.</td>
<td></td>
</tr>
<tr>
<td>47</td>
<td>Demonstrate lifting and carrying techniques.</td>
<td></td>
</tr>
<tr>
<td>48</td>
<td>Demonstrate safe laddering techniques.</td>
<td></td>
</tr>
<tr>
<td>49</td>
<td>Report injuries.</td>
<td></td>
</tr>
<tr>
<td>50</td>
<td>Report personal, environmental, and equipment safety violations to the appropriate authority.</td>
<td>English: 10.1, 10.5, 10.6, 10.7, 11.1, 11.5, 11.6, 11.7 History and Social Science: GOVT.15</td>
</tr>
<tr>
<td>51</td>
<td>Earn the OSHA 10 card.</td>
<td></td>
</tr>
<tr>
<td>52</td>
<td>Pass safety exam.</td>
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</tr>
<tr>
<td>53</td>
<td>Check stock and assemblies for squareness.</td>
<td>Mathematics: G.8</td>
</tr>
<tr>
<td>54</td>
<td>Measure materials.</td>
<td></td>
</tr>
<tr>
<td>55</td>
<td>Determine levelness and plumbness of surfaces, using a level.</td>
<td></td>
</tr>
<tr>
<td>56</td>
<td>Store materials.</td>
<td></td>
</tr>
<tr>
<td>57</td>
<td>Select materials.</td>
<td></td>
</tr>
<tr>
<td>58</td>
<td>Identify hand and power tools commonly used in cabinetmaking.</td>
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</tr>
<tr>
<td>59</td>
<td>Maintain hand tools.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Description</td>
<td>Subject/Standard</td>
</tr>
<tr>
<td>---</td>
<td>-----------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>60</td>
<td>Describe the safe use of power-driven fastening equipment.</td>
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</tr>
<tr>
<td>61</td>
<td>Identify the benefits of the major woods and wood products used in cabinetmaking.</td>
<td>Science: ES.6</td>
</tr>
<tr>
<td>62</td>
<td>Distinguish among popular applications of cabinets in residential and commercial installation.</td>
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</tr>
<tr>
<td>63</td>
<td>Cut stock to size +/- 1/8 inch.</td>
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<tr>
<td>64</td>
<td>Bore holes.</td>
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<tr>
<td>65</td>
<td>Cut butt joint.</td>
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<tr>
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<td>Make a doweled joint.</td>
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<td>Cut biscuit joint.</td>
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<td>69</td>
<td>Cut lap joint.</td>
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<td>Join edges of stock.</td>
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<td>Determine use of materials.</td>
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<td>84</td>
<td>Apply safety rules when using finishing materials.</td>
<td>English: 10.5, 11.5</td>
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<td>Remove excess glue.</td>
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</table>

Entrepreneurship Infusion Units
Entrepreneurship Infusion Units may be used to help students achieve additional, focused competencies and enhance the validated tasks/competencies related to identifying and starting a new business venture. Because the unit is a complement to certain designated courses and is not mandatory, all tasks/competencies are marked “optional.” Teachers can find the infusion/unit in the course listing.
Appendix: Credentials, Course Sequences, and Career Cluster Information

Industry Credentials: Only apply to 36-week courses

- Cabinetmaking Assessment
- Cabinetmaking Examination
- College and Work Readiness Assessment (CWRA+)
- Customer Service Examination
- Customer Service Specialist (CSS) Examination
- National Career Readiness Certificate Assessment
- Professional Communications Certification Examination
- Workplace Readiness Skills for the Commonwealth Examination

Concentration sequences: A combination of this course and those below, equivalent to two 36-week courses, is a concentration sequence. Students wishing to complete a specialization may take additional courses based on their career pathways. A program completer is a student who has met the requirements for a CTE concentration sequence and all other requirements for high school graduation or an approved alternative education program.

- Cabinetmaking II (8605/36 weeks, 280 hours)

Career Cluster: Architecture and Construction

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<th>Pathway</th>
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<tr>
<td></td>
<td>Carpenter</td>
</tr>
<tr>
<td></td>
<td>Drywall Installer</td>
</tr>
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</table>