# Cabinetmaking II

8605 36 weeks / 280 hours

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### Acknowledgments

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

**Suggested Grade Level:** 11 or 12  
**Prerequisites:** 8604

Students continue to learn workshop and tool safety and enhance their employability skills as they interpret plans; estimate and select materials; cut and shape stock; assemble, fasten, and install components; install interior finishes; apply wood veneers and plastic laminates; finish surfaces; and transport and install cabinets. 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 (〇) are optional
- Tasks/competencies designated by minus icons (➖) are omitted
- Tasks marked with an asterisk (*) are sensitive.

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<td>Report injuries.</td>
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<td>Report personal, environmental, and equipment safety violations to the appropriate authority.</td>
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<td>Pass safety exam.</td>
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**Cutting and Shaping Stock**
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<td>Cut stock to size +/- 1/16 inch.</td>
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<td>53</td>
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<td>Cut dado and rabbet joint.</td>
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<td>Cut mortise and tenon joint.</td>
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<td>Cut spline joint.</td>
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<td>☑</td>
<td>Cut tongue and groove joint.</td>
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<td>57</td>
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<td>Cut laminate.</td>
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Assembling, Fastening, and Installing Components

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<td>☑</td>
<td>Apply clamping devices for advanced joinery.</td>
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<tr>
<td>59</td>
<td>☑</td>
<td>Reinforce joints with block or dowel.</td>
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<td>60</td>
<td>☑</td>
<td>Assemble drawer components.</td>
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<td>61</td>
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<td>Construct case/box.</td>
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<tr>
<td>62</td>
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<td>Construct face frame.</td>
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<tr>
<td>63</td>
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<td>Explain procedures for assembling panel doors.</td>
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<tr>
<td>64</td>
<td>☑</td>
<td>Attach molding and trim.</td>
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<tr>
<td>65</td>
<td>☑</td>
<td>Fasten top to casework.</td>
</tr>
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<td>66</td>
<td>☑</td>
<td>Install cabinet hardware.</td>
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<td>67</td>
<td>☑</td>
<td>Install cabinet doors.</td>
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<td>68</td>
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<td>Install cabinet shelves.</td>
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Estimating and Selecting Materials

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<td>Estimate labor and material cost.</td>
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<td>71</td>
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<td>Install closet accessories, including shelving.</td>
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<td>72</td>
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<td>Install baseboard.</td>
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<td>73</td>
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<td>Install ceiling molding.</td>
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<tr>
<td>74</td>
<td></td>
<td>Describe the installation process for residential kitchen, closet, and built-in cabinets.</td>
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<tr>
<td>75</td>
<td></td>
<td>Describe the installation process for commercial casework and architectural millwork.</td>
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<td>Construct open shelving.</td>
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<td>Fit plastic laminate joints.</td>
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<td>Apply laminate, using contact cement.</td>
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<td>Apply wood edges.</td>
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<td>Cut out for sink.</td>
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<td>Apply safety rules when using finishing materials.</td>
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<td>Select finishing materials for compatibility.</td>
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<td>Apply stains.</td>
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<td>Apply lacquer, varnish, or polyurethane.</td>
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<td>86</td>
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<td>Repair blemishes and touch up finishes.</td>
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**Transporting and Installing Cabinets**

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<td>Prepare cabinets for transportation.</td>
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<td>88</td>
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<td>Prepare wall and base cabinets for installation.</td>
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<td>Install wall and base cabinets.</td>
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<td>90</td>
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<td>Select prefabricated cabinets.</td>
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<tr>
<td>91</td>
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<td>Install prefabricated countertops.</td>
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**Installing Countertops and Backsplashes**

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<td>Identify the installation process for an undermount sink in a countertop.</td>
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<td>Identify the parts of a countertop.</td>
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<td>Identify considerations for handling solid-surface countertops.</td>
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<td>Describe the procedure for installing a backsplash.</td>
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**Refacing Cabinets**

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<td>Identify benefits of cabinet refacing.</td>
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<td>Identify demolition procedures.</td>
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<td>Explain procedures for modifying cabinets.</td>
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<td>Explain procedures for installing bottom and side panels.</td>
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<td>Determine the need for new cabinet construction vs. cabinet refacing.</td>
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**Investigating the Cabinetmaking Industry**

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<td>Identify educational opportunities related to cabinetmaking.</td>
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<tr>
<td>102</td>
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<td>Identify emerging technologies in the cabinetmaking industry.</td>
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<td>103</td>
<td>+</td>
<td>Identify career opportunities in the cabinetmaking industry.</td>
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<tr>
<td>104</td>
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<td>Explain the business environment that generates demand for cabinets and cabinetmaking.</td>
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**Exploring Cabinet Design**

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<td>Create a rough sketch.</td>
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<td>Identify design considerations related to cabinetry.</td>
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<td>107</td>
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<td>Identify the advantages of using CAD software vs. hand drawing.</td>
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<td>Draw detailed plans, using CAD software.</td>
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**Exploring CNC Equipment and Routers**

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<td>Identify major types of CNC machinery.</td>
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<td>Explain the CNC machining process for woodworking.</td>
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<td>111</td>
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<td>Identify tooling used with CNC machinery.</td>
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</tbody>
</table>

Legend: ✗Essential ☐Non-essential ☐Omitted

---

**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 (SDS), 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.

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.

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 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.

---

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 are the proper actions to take 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.

---

**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 involve 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 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.

Task Number 48
Demonstrate safe laddering techniques.

Definition

Demonstration should involve 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 consist of 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 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

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.

Cutting and Shaping Stock

Task Number 52

Cut stock to size +/- 1/16 inch.

Definition

Cutting to size should include marking the length and cutting to within specifications +/- 1/16 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?

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 53

Cut dado and rabbet joint.
Definition

Cutting a dado and rabbet joint should include setting the cutting depth of the equipment being used, setting the blades according to the type of dado or rabbet joint being cut, and making the necessary cut passes.

Process/Skill Questions

- What are the different machines that can make cuts for dado and rabbet joints?
- When does a dado become a “groove”?
- What are the benefits and drawbacks of dado and rabbet joints?
- Where are you likely to find examples of dado and rabbet 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 54

Cut mortise and tenon joint.

Definition

Cutting a mortise and tenon joint should include performing layout procedures, making the cut, and forming the joint between the mortise and tenon.

Process/Skill Questions

- What are the different machines that can make cuts for mortise and tenon joints?
- What are the benefits and drawbacks of mortise and tenon 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
    o 27501-03 Cabinetmaking

Task Number 55

Cut spline joint.

Definition

Cutting a spline joint should include setting up the saw or machine to be used, cutting the groove for the spline placement, and aligning the wood surfaces by inserting the spline in the grooves.

Process/Skill Questions

- What are the different machines that can make cuts for spline joints?
- What are the benefits and drawbacks of spline joints?
- Where are you likely to find examples of spline 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
Task Number 56
Cut tongue and groove joint.

Definition
Cutting a tongue and groove joint should include setting up the machine being used and making the appropriate passes.

Process/Skill Questions

- What are the different machines that can make cuts for tongue and groove joints?
- What are the benefits and drawbacks of tongue and groove joints?
- Where are you likely to find examples of tongue and groove 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 57
Cut laminate.

Definition
Cutting laminate should include pre-scoring the laminate, placing the laminate in the correct direction according to the machine being used, and making the cut.

**Process/Skill Questions**

- What tools and equipment can be used for cutting rigid or flexible laminate?
- What are the benefits and drawbacks of using laminate?

**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.

**Assembling, Fastening, and Installing Components**

**Task Number 58**

**Apply clamping devices for advanced joinery.**

**Definition**

Application should include

- identifying the joint to be clamped
- choosing the proper clamp for the 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 commonly used in 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 59

Reinforce joints with block or dowel.

Definition

Reinforcing joints should include fitting a small block into the corner of a joint and gluing or holding the block in place with mechanical fasteners, or a dowel may be used by drilling a hole into the joint the size of the dowel and installing by inserting it with glue into the joint.

Process/Skill Questions

- When is the use of a glue block appropriate?
- When is the use of a dowel appropriate?
- When and why is reinforcement necessary?

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 60

Assemble drawer components.

Definition

Assembly should include the sides, front, back, and bottom, using glue and mechanical fasteners, and checking for squareness.

Process/Skill Questions

- What is the first step after cutting the components for a drawer assembly?
- What are some different fastening and joining techniques?
- What materials are used when fastening drawer components?
- How does the guide system affect the size of a drawer?

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 61

Construct case/box.

Definition

Construction of base cabinet or wall cabinet case/box should include

- laying out and measuring dimensions to specifications
- cutting ends, back, and interior bracing
- attaching bottom to sides, using mechanical fasteners
squaring and attaching back end with mechanical fasteners.

Process/Skill Questions

- Why is it important to properly lay out a project?
- How can cuts be made to parts to eliminate chipping and splintering of laminates?
- What determines blade selection when constructing a case/box?
- What types of mechanical fasteners are used when constructing a case/box?
- How should a cabinet be squared?

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 62

Construct face frame.

Definition

Construction of face frame should include

- cutting components to size, based on principles of design
- laying out components
- joining by appropriate techniques.

Process/Skill Questions

- What quality should the components have before assembling?
- When does a dry fit take place?
- What are the differences between a face frame and a frameless cabinet?
- Why is a face frame beneficial?

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 63

Explain procedures for assembling panel doors.

Definition

Explanation should include procedures for

- dry-fitting all components
- checking for squareness
- disassembling and applying glue to ends of rails and stiles
- reassembling all pieces
- clamping
- checking for square.

Process/Skill Questions

- What are the three components of a panel door?
- What are measuring allowances for panel door assembly?
- How is squareness checked?

Common Career Technical Core

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

NCCER Standards

Carpentry Fundamentals: Level 1

- 27102-06 Building Materials, Fasteners, and Adhesives

Cabinetmaking

- 27501-03 Cabinetmaking

Task Number 64
Attach molding and trim.

Definition

Attaching molding and trim should include measuring and cutting the length, fitting the joints, and assembling, using appropriate fasteners.

Process/Skill Questions

- What fasteners are used to install molding and trim? Why?
- What types of joints are used to attach molding and trim? Why?
- How are nail holes repaired and concealed?

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

Task Number 65

Fasten top to casework.

Definition

Fastening should include selecting the appropriate fasteners, pre-drilling the attachment points if necessary, and using the fasteners to attach the top.

Process/Skill Questions

- Why is the top typically the last piece of casework installed?
- When are mechanical fasteners used to install the top?
• What is a cleat, and when is it used to fasten a top to casework?

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 66

Install cabinet hardware.

Definition

Installation should include laying out and drilling holes for location of the hardware to be installed (e.g., catches, hinges, pulls and knobs, tracks) and fastening the hardware in place.

Process/Skill Questions

- Why is layout critical when installing hardware?
- What is the function of a catch?
- What are the different types of hinges available?
- Why are self-closing hinges used?
- When is a knob used instead of a pull?
- When using manufactured products, why is it important to follow manufacturer's guidelines?
- What are the inherent problems with sliders?
- When are sliding doors the best choice?
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 67

Install cabinet doors.

Definition

Installation should include attaching the hinges to the door, centering the door on the face-frame opening, and attaching the hinges to the casework.

Process/Skill Questions

- What are the critical elements of layout?
- Is pre-drilling always necessary when installing hinges? Why, or why not?
- How are self-centering drill bits helpful?

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 68

Install cabinet shelves.

Definition
Installation should include fitting the shelf in a dado and securing it with glue during assembly of the casework, or installing adjustable hardware and setting the shelf after the cabinet is in place.

Process/Skill Questions
- What is a rack-mount shelf?
- What is a roll-out shelf?
- What are the practical concerns when choosing appropriate shelving?

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

Estimating and Selecting Materials

Task Number 69
Determine materials from a CAD drawing.

Definition

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

Process/Skill Questions

- Why would a carpenter need to determine materials from a CAD drawing?
- Where would one find information about cabinet details on drawings?

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

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

Cabinetmaking

- 27501-03 Cabinetmaking

Task Number 70
Estimate labor and material cost.

Definition

Estimation should include

- preparing a material list, using plans
- contacting a local supplier for pricing
- calculating flat labor cost
- increasing material and labor cost by a specified percent to include profit.

Process/Skill Questions

- How is labor cost generated?
- What is an addendum to a contract? What information might be included in an addendum?
- If material costs rise during a job, is it possible to raise the cost of the job? Why, or why not?

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

    Carpentry Fundamentals: Level 1

    o 27102-06 Building Materials, Fasteners, and Adhesives

Exploring Interior Finishes

Task Number 71

Install closet accessories, including shelving.

Definition
Installation should include laying out and installing accessories at specified locations and at standard heights, according to manufacturer's specifications.

**Process/Skill Questions**

- What is the standard height/location for the closet rod?
- What are the considerations for installing shelving with a closet rod?
- What are the options when purchasing closet accessories?

**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

**Carpentry: Level 3**

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

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**Task Number 72**

**Install baseboard.**

**Definition**

Installation should include

- installing baseboard, according to plan
- ensuring that baseboard butts tightly where wall and floor intersect
- ensuring that all copes and miters fit with no gaps
- nailing baseboard to stud and bottom plate, with all nails set.
Process/Skill Questions

- What methods could be used to cut baseboards on inside corners?
- How do installation methods differ for various types of baseboards?

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

Carpentry: Level 3

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

Task Number 73

Install ceiling molding.

Definition

Installation should include coping inside corners, mitering outside corners to fit with no gaps, and ensuring that all nails are set.

Process/Skill Questions

- What are the different types of ceiling molding?
- What is the procedure to cope the inside corners of ceiling molding?
- What are the disadvantages of mitering vs. coping the inside corners of ceiling molding?
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

Carpentry: Level 3

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

Task Number 74

Describe the installation process for residential kitchen, closet, and built-in cabinets.

Definition
Description should include the installation process for base and wall cabinets and a variety of vanity/medicine cabinets.

Process/Skill Questions

- When installing base cabinets, what adjustments should be made when floors are out of level?
- At what height are wall cabinets typically installed above base cabinets? Why?
- What responsibilities does the cabinetmaker have to the plumber during installation around plumbing rough-ins?

Common Career Technical Core
AC1
Use vocabulary, symbols and formulas common to architecture and construction.

Task Number 75

Describe the installation process for commercial casework and architectural millwork.

Definition

Description should include knock-down (KD) cabinetry assembly, melamine and laminate materials, and wood casework.

Process/Skill Questions

- What does the term knock-down cabinetry mean?
- What types of materials is melamine applied over?
- What is a substrate, and what purpose does it serve in the cabinet industry?

Common Career Technical Core

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

Task Number 76

Construct open shelving.

Definition

Construction should include adequate supports for the ends of shelves as well as supports to eliminate sagging.

Process/Skill Questions

- What are some commonly used types of open shelves? How do they differ?
- What fastening methods are used for different types of open shelving?

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

Carpentry: Level 3

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

Applying Wood Veneers and Plastic Laminates

Task Number 77

Apply edge banding.

Definition

Application should include using a variety of glue systems to attach banding to the edge of plywood, particle board, or medium-density fiberboard (MDF) to disguise the edge of the material.

Process/Skill Questions

- What is used to attach the banding? Why?
- How is the length of the band determined?
- How is the band trimmed, and what tools can be used to do so?

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

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**Task Number 78**

**Fit plastic laminate joints.**

**Definition**

Fitting should include butting together two pieces of laminate, using a router with a small, straight bit.

**Process/Skill Questions**

- How can an accurate cut be ensured?
- When is a butt joint necessary?
- How are cutting irregularities accounted for?

**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**
Task Number 79

Apply laminate, using contact cement.

Definition

Application should include

- measuring with allowances for trimming
- applying adhesive to core and laminate
- supporting and aligning laminate above the core prior to adhering
- adhering, working from one end, section by section, to ensure alignment, and avoiding air pockets and wrinkles.

Process/Skill Questions

- Why are the sticks necessary when applying laminate?
- What imperfections can occur when adhering laminate to core improperly?
- What tool ensures correct bond?

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 80

Apply wood edges.

Definition

Application should include gluing a thin wooden strip to the edge of plywood, particle board, or MDF and clamping until set.

Process/Skill Questions

- When is a wooden edge desirable?
- What types of fasteners are used to install a wooden edge?
- How are wooden edges shaped?

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

Task Number 81

Cut out for sink.

Definition

Cutting out for sink should include

- protecting the countertop
• laying out according to the sink manufacturer's specifications
• using the appropriate tool to cut out the sink shape, supporting cutout to prevent break off.

Process/Skill Questions

• What techniques can be used to protect the countertop when cutting out for a sink?
• What tools can be used to make the cutout?
• Why is layout critical when cutting out for a sink?

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

  o 27102-06 Building Materials, Fasteners, and Adhesives

Finishing Surfaces

Task Number 82

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 PPE are required when using finishing materials?
- What are the consequences of inhaling or being overexposed to finishing materials?

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

Carpentry Fundamentals: Level 1

- 27102-06 Building Materials, Fasteners, and Adhesives

Task Number 83

Select finishing materials for compatibility.

Definition

Selection should include reading the manufacturer’s instructions, and, if necessary, applying the material in a hidden area and allowing the finish to dry as a test before applying to the remainder of the object.

Process/Skill Questions

- What causes finishing materials to be incompatible?
- What results from incompatible finishing materials?
- How is incompatibility of finishing materials prevented?

Common Career Technical Core

AC-CST7
Compare and contrast the building systems and components required for a construction project.
Task Number 84

Apply stains.

Definition

Application should be made by following manufacturer’s specifications, staining one section or panel completely before moving on to the next.

Process/Skill Questions

- What is the purpose of stain?
- What are the safety precautions to be taken when applying stains?
- Why should stains be tested on a hidden part of the material?

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 85

Apply lacquer, varnish, or polyurethane.

Definition

Application should include following manufacturer’s specifications, maintaining a wet edge, and covering evenly and thoroughly.

Process/Skill Questions

- What is the purpose of lacquer?
- What are the safety precautions to be taken when applying lacquers?
- What is the importance of a wet edge?
- What is the advantage of using polyurethane over other types of topcoats?

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 86**

**Repair blemishes and touch up finishes.**

**Definition**

Repair should include masking off the area, selecting sandpaper of an appropriate grit, sanding lightly, and applying finishes as needed.

**Process/Skill Questions**

- What is the difference between a blemish and damage?
- What is a fill stick? How is it used?
- What is a touch-up pen? How is it used?
- When is it preferable to replace rather than repair a blemished item?

**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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**Transporting and Installing Cabinets**

**Task Number 87**

**Prepare cabinets for transportation.**

**Definition**

Preparation should include

- securing all doors, drawers, and shelves
- selecting and applying protective materials
• loading cabinets in reverse order of installation.

Process/Skill Questions

• What methods should be used to protect cabinets when hauling?
• What are the potential consequences of not protecting cabinets when hauling?

Task Number 88

Prepare wall and base cabinets for installation.

Definition

Preparation should include

• off-loading cabinets and organizing in order of installation
• removing all packing materials
• removing doors, drawers, and shelves prior to installation.

Process/Skill Questions

• What are safe handling procedures for moving cabinets?
• What are the advantages and disadvantages of fastening cabinets with the doors on? With the doors off?

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 89

Install wall and base cabinets.

Definition

Installation should include
• staging cabinets according to plans
• checking for squareness
• aligning
• making cabinets level to wall and floor.

Process/Skill Questions

• Which cabinets are installed first? Why?
• Why is it crucial that base cabinets are level when they are installed?
• What is the standard distance between the bottom of wall cabinets and the top of base cabinets?

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 90

Select prefabricated cabinets.

Definition

Selection should include

• visiting building supply
• securing prefabricated cabinet list
• identifying units by model according to plan.

Process/Skill Questions

• What set of drawings would be used to find the cabinet list?
• How does price relate to the quality of cabinets?
• How does a composite cabinet compare to a solid wood cabinet?
• How does finish affect the selection of wood?

Common Career Technical Core

AC-CST7
Compare and contrast the building systems and components required for a construction project.
Task Number 91

Install prefabricated countertops.

Definition

Installation should include

- checking walls and cabinets for squareness
- measuring and sizing countertop before installation
- shimming and leveling countertop
- securing countertop with manufacturer-approved fasteners.

Process/Skill Questions

- What types of countertop materials are available?
- What factors should be considered when selecting a countertop?
- What are the measuring and fastening procedures for countertop installation?

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

Installing Countertops and Backsplashes

Task Number 92

Identify the installation process for an undermount sink in a countertop.
Definition

Identification should include the sink material, countertop material, and appropriate adhesives for attachment.

Process/Skill Questions

- What type of adhesive is used when installing an undermount sink in a countertop? Why?
- What is the best caulking material for undermount sinks? Why?

Common Career Technical Core

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

Task Number 93

Identify the parts of a countertop.

Definition

Identification should include

- top
- riser
- habar
- sidebar
- backsplash
- sidesplash
- corner
- edge
- build-up
- polished edge
- cutout
- corbel.

Process/Skill Questions

- What is a backsplash? What purpose does it serve?
- What materials are best suited for countertops? Why?

Common Career Technical Core

AC1
Task Number 94

Identify considerations for handling solid-surface countertops.

Definition

Identification should include the weight of the countertop, direction of the carry, and support of the countertop.

Process/Skill Questions

- What tools are required for handling solid-surface countertops?
- Why would support cleats be needed for a solid-surface countertop?
- What is the typical length of solid-surface countertops?

Common Career Technical Core

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

Task Number 95

Describe the procedure for installing a backsplash.

Definition

Description should include procedures for waterproofing and attaching various types of backsplash materials, including but not limited to

- laminate
- tile
- stone
- wood.

Process/Skill Questions

- What tools are required for installing a backsplash?
- What types of adhesives are used when waterproofing and attaching backsplashes?
• Why should the electricity be turned off while installing a backsplash?

Common Career Technical Core

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

Refacing Cabinets

Task Number 96

Identify benefits of cabinet refacing.

Definition

Identification should include benefits such as time and financial savings.

Process/Skill Questions

• What is cabinet refacing?
• When might cabinet refacing be chosen over other options?

Common Career Technical Core

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

Task Number 97

Identify demolition procedures.

Definition

Identification should include procedures for removing old doors, drawers, slides, trim, counter, and appliances.

Process/Skill Questions

• What safety precautions should be taken when performing demolition procedures?
• What steps should be taken to protect furniture and fixtures that are not undergoing demolition?
Common Career Technical Core

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

Task Number 98

Explain procedures for modifying cabinets.

Definition

Explanation should include procedures for

- replacing face frames
- adding blocking for panels
- repairing and reattaching cabinets
- hanging new cabinets.

Process/Skill Questions

- What kinds of modifications can be made to existing cabinets?
- What tools and equipment might be needed when modifying cabinets?

Common Career Technical Core

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

Task Number 99

Explain procedures for installing bottom and side panels.

Definition

Explanation should include procedures for

- preparing surfaces for adhesive or blocking
- installing flat panels
- installing toe kicks.

Process/Skill Questions
What are the procedures for preparing surfaces for adhesive or blocking?

• What is the purpose of a toe kick?

Common Career Technical Core

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

Task Number 100

Determine the need for new cabinet construction vs. cabinet refacing.

Definition

Determination should include cost, time, damage, design, and other considerations.

Process/Skill Questions

• What resources could be used to help identify new cabinet construction and refacing options?
• What do you think is the most important factor when considering new cabinet construction vs. cabinet refacing? Why?

Common Career Technical Core

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

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

Investigating the Cabinetmaking Industry

Task Number 101

Identify educational opportunities related to cabinetmaking.

Definition

Identification should include
• industry certifications  
• postsecondary education  
• apprenticeships.

**Process/Skill Questions**

• What are available industry certifications related to cabinetmaking?  
• Where can you find information about cabinetmaking apprenticeships or postsecondary education opportunities?

**Common Career Technical Core**

AC7  
Describe career opportunities and means to achieve those opportunities in each of the Architecture & Construction Career Pathways.

---

**Task Number 102**

**Identify emerging technologies in the cabinetmaking industry.**

**Definition**

Identification should include

• computer numeric control (CNC) technology  
• computer-aided design (CAD) software  
• other emerging technologies.

**Process/Skill Questions**

• What emerging technologies are currently affecting the cabinetmaking industry? How?  
• What are advantages of using CNC and CAD technology in cabinetmaking?

**Common Career Technical Core**

AC4  
Evaluate the nature and scope of the Architecture & Construction Career Cluster and the role of architecture and construction in society and the economy.

---

**Task Number 103**
Identify career opportunities in the cabinetmaking industry.

Definition

Identification should include examples such as:

- cabinet builder
- furniture fabricator
- cabinet refinisher
- designer
- cabinetmaking entrepreneur.

Process/Skill Questions

- What are the job descriptions, education requirements, and average salaries for various careers in the cabinetmaking industry?
- Where can you find information about various careers in the cabinetmaking industry?

Common Career Technical Core

AC5
Describe the roles, responsibilities and relationships found in the architecture and construction trades and professions, including labor/management relationships.

AC7
Describe career opportunities and means to achieve those opportunities in each of the Architecture & Construction Career Pathways.

Task Number 104

Explain the business environment that generates demand for cabinets and cabinetmaking.

Definition

Explanation should include new construction, remodeling, and repair and replacement.

Process/Skill Questions

- What is the current level of demand for cabinets and cabinetmaking?
- How do you think the demand for cabinets and cabinetmaking will change over time?

Explain your prediction.

Common Career Technical Core
AC4
Evaluate the nature and scope of the Architecture & Construction Career Cluster and the role of architecture and construction in society and the economy.

Exploring Cabinet Design

Task Number 105
Create a rough sketch.

Definition
Creating a rough sketch should include

- identifying dimensions
- depicting views.

Process/Skill Questions

- What is the purpose of creating a rough sketch?
- What views can be depicted in a rough sketch?

Common Career Technical Core

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

Task Number 106
Identify design considerations related to cabinetry.

Definition
Identification should include

- aesthetic value
- functionality
- durability
- practicality.

Process/Skill Questions
• What are some traditional styles of cabinetry? Contemporary styles?
• When might you use a face frame case? A frameless case?

Common Career Technical Core

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

Task Number 107

Identify the advantages of using CAD software vs. hand drawing.

Definition

Identification should include

• availability of three-dimensional renderings for client approval
• generation of parts list and materials
• optimization of materials being used
• estimation of job costs
• time savings
• ease of manipulating drawings.

Process/Skill Questions

• How can CAD software be used to estimate job costs?
• Why might it be important to have the ability to change a drawing when working with a client?

Common Career Technical Core

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

Task Number 108

Draw detailed plans, using CAD software.

Definition
Drawings should include joints, contours, or assemblies by using pictorial, section, assembly, or exploded views.

Process/Skill Questions

- What is the purpose of a detailed plan?
- What resources are available to help you learn how to use CAD software?

Common Career Technical Core

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

Exploring CNC Equipment and Routers

Task Number 109

Identify major types of CNC machinery.

Definition

Identification should include

- routers
- lathes
- saws.

Process/Skill Questions

- What are the main types of machining centers for wood?
- What are some applications for major types of CNC machinery?

Common Career Technical Core

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

Task Number 110

Explain the CNC machining process for woodworking.
Definition

Explanation should include

- creating a visual representation, using CAD software
- converting geometry into machining instructions, using CAM software
- translating instructions into G-code for post-processing
- delivering motion instructions via the CNC controller
- holding the part for execution of CNC machining.

Process/Skill Questions

- What is the role of CAD software in the CNC machining process? What is the role of CAM software?
- What is meant by the term fixturing? Why is it important?

Common Career Technical Core

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

Task Number 111

Identify tooling used with CNC machinery.

Definition

Identification should include

- drill bits
- router bits
- saw blades
- aggregates.

Process/Skill Questions

- What is meant by the term chip load? Why is it important?
- What materials are commonly used for CNC tooling?

Common Career Technical Core

AC1
Use vocabulary, symbols and formulas common to architecture and construction.
### SOL Correlation by Task

<table>
<thead>
<tr>
<th>Task</th>
<th>Description</th>
<th>Subject Areas</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>
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</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>
</tbody>
</table>
| 50   | Report personal, environmental, and equipment safety violations to the appropriate authority. | English: 11.1, 11.5, 11.6, 11.7, 12.1, 12.5, 12.6, 12.7  
History and Social Science: GOVT.15 |
<p>| 51   | Pass safety exam. |  |
| 52   | Cut stock to size +/- 1/16 inch. |  |
| 53   | Cut dado and rabbet joint. |  |
| 54   | Cut mortise and tenon joint. |  |
| 55   | Cut spline joint. |  |
| 56   | Cut tongue and groove joint. |  |
| 57   | Cut laminate. |  |
| 58   | Apply clamping devices for advanced joinery. |  |
| 59   | Reinforce joints with block or dowel. |  |
| 60   | Assemble drawer components. |  |
| 61   | Construct case/box. |  |
| 62   | Construct face frame. |  |
| 63   | Explain procedures for assembling panel doors. |  |</p>
<table>
<thead>
<tr>
<th>64</th>
<th>Attach molding and trim.</th>
</tr>
</thead>
<tbody>
<tr>
<td>65</td>
<td>Fasten top to casework.</td>
</tr>
<tr>
<td>66</td>
<td>Install cabinet hardware.</td>
</tr>
<tr>
<td>67</td>
<td>Install cabinet doors.</td>
</tr>
<tr>
<td>68</td>
<td>Install cabinet shelves.</td>
</tr>
<tr>
<td>69</td>
<td>Determine materials from a CAD drawing.</td>
</tr>
<tr>
<td>70</td>
<td>Estimate labor and material cost.</td>
</tr>
<tr>
<td>71</td>
<td>Install closet accessories, including shelving.</td>
</tr>
<tr>
<td>72</td>
<td>Install baseboard.</td>
</tr>
<tr>
<td>73</td>
<td>Install ceiling molding.</td>
</tr>
<tr>
<td>74</td>
<td>Describe the installation process for residential kitchen, closet, and built-in cabinets.</td>
</tr>
<tr>
<td>75</td>
<td>Describe the installation process for commercial casework and architectural millwork.</td>
</tr>
<tr>
<td>76</td>
<td>Construct open shelving.</td>
</tr>
<tr>
<td>77</td>
<td>Apply edge banding.</td>
</tr>
<tr>
<td>78</td>
<td>Fit plastic laminate joints.</td>
</tr>
<tr>
<td>79</td>
<td>Apply laminate, using contact cement.</td>
</tr>
<tr>
<td>80</td>
<td>Apply wood edges.</td>
</tr>
<tr>
<td>81</td>
<td>Cut out for sink.</td>
</tr>
<tr>
<td>82</td>
<td>Apply safety rules when using finishing materials.</td>
</tr>
<tr>
<td>83</td>
<td>Select finishing materials for compatibility.</td>
</tr>
<tr>
<td>84</td>
<td>Apply stains.</td>
</tr>
<tr>
<td>85</td>
<td>Apply lacquer, varnish, or polyurethane.</td>
</tr>
<tr>
<td>86</td>
<td>Repair blemishes and touch up finishes.</td>
</tr>
<tr>
<td>87</td>
<td>Prepare cabinets for transportation.</td>
</tr>
<tr>
<td>88</td>
<td>Prepare wall and base cabinets for installation.</td>
</tr>
<tr>
<td>89</td>
<td>Install wall and base cabinets.</td>
</tr>
<tr>
<td>90</td>
<td>Select prefabricated cabinets.</td>
</tr>
<tr>
<td>91</td>
<td>Install prefabricated countertops.</td>
</tr>
<tr>
<td>92</td>
<td>Identify the installation process for an undermount sink in a countertop.</td>
</tr>
<tr>
<td>93</td>
<td>Identify the parts of a countertop.</td>
</tr>
<tr>
<td>94</td>
<td>Identify considerations for handling solid-surface countertops.</td>
</tr>
<tr>
<td>95</td>
<td>Describe the procedure for installing a backsplash.</td>
</tr>
<tr>
<td>96</td>
<td>Identify benefits of cabinet refacing.</td>
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<td></td>
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<td>---</td>
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<tr>
<td>97</td>
<td>Identify demolition procedures.</td>
</tr>
<tr>
<td>98</td>
<td>Explain procedures for modifying cabinets.</td>
</tr>
<tr>
<td>99</td>
<td>Explain procedures for installing bottom and side panels.</td>
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<td>Determine the need for new cabinet construction vs. cabinet refacing.</td>
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**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 I (8604/36 weeks, 140 hours)

Career Cluster: Architecture and Construction

<table>
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<th>Occupations</th>
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</tr>
<tr>
<td></td>
<td>Carpenter</td>
</tr>
<tr>
<td></td>
<td>Drywall Installer</td>
</tr>
</tbody>
</table>