Module One (27201-13) describes how to read and interpret a set of commercial drawings and specifications.

### Objectives

#### Learning Objective 1
- Identify the types and uses of commercial construction drawings and schedules.
  - a. Compare and contrast residential and commercial construction drawings.
  - b. Describe the purpose of a civil drawing.
  - c. Describe the use of architectural drawings and schedules.
  - d. Describe the use of structural drawings.
  - e. Describe the purpose of mechanical, electrical, and plumbing drawings.
  - f. Compare drawings from two different disciplines.

#### Learning Objective 2
- Define the use of specifications and how they are referenced.
  - a. Describe the format of specifications.
  - b. Explain how specifications are written.

### Performance Tasks

#### Performance Task 1 (Learning Objective 1)
- Locate 10 items contained in a set of commercial drawings. (The instructor will select the 10 items.)

#### Performance Task 2 (Learning Objective 1)
- Examine a drawing to cross-reference the accuracy of dimensions from architectural to structural drawings.

#### Performance Task 3 (Learning Objective 1)
- Using an instructor-provided schedule, identify various criteria necessary for interpretation.

#### Performance Task 4 (Learning Objective 1)
- Using an instructor-provided shop drawing, interpret key aspects of that drawing.

---

**Teaching Time: 25 hours**  
(Ten 2.5-hour classroom sessions)

Session time may be adjusted to accommodate your class size, schedule, and teaching style.

**Prerequisites**

*Core Curriculum* and *Carpentry Level One*

**Before You Begin**

As you prepare for each session, allow sufficient time to review the course objectives, content, visual aids (including the PowerPoint® presentation), and these lesson plans, and to gather the required equipment and materials. Consider time required for demonstrations, laboratories, field trips, and testing.

Using your access code, download the Module Examinations and Performance Profile Sheets from [www.nccerirc.com](http://www.nccerirc.com). The passing score for submission into NCCER’s Registry is 70 percent or above for the Module Examination; performance testing is graded pass or fail.
**Safety Considerations**

Safety is paramount in the carpentry trade and safe habits and practices must be emphasized whenever possible. Performance Tasks must be completed under your supervision. Each trainee must use required PPE and follow safe tool practices and procedures.

<table>
<thead>
<tr>
<th>Classroom Equipment and Materials</th>
<th>Equipment and Materials for Laboratories and Performance Testing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Whiteboard/chalkboard</td>
<td>Architectural drawings</td>
</tr>
<tr>
<td>Markers/chalk</td>
<td>Examples of BIM images</td>
</tr>
<tr>
<td>Pencils and paper</td>
<td>Examples of schedules</td>
</tr>
<tr>
<td><em>Carpentry Level Two PowerPoint ©</em></td>
<td>Framing plans</td>
</tr>
<tr>
<td>Presentation Slides</td>
<td>MEP drawings</td>
</tr>
<tr>
<td>Computer</td>
<td>Photographs of commercial roofs</td>
</tr>
<tr>
<td>Copies of the Module Examination and Performance Profile Sheets</td>
<td>Photographs of different framing methods</td>
</tr>
<tr>
<td>Vendor-supplied videos/DVDs showing commercial drawings (optional)</td>
<td></td>
</tr>
<tr>
<td>TV/DVD player</td>
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</tr>
</tbody>
</table>

**Additional Resources and References**

This module presents thorough resources for task training. The following resource material is suggested for further study:


There are a number of online resources available for trainees who would like more information on commercial drawings. A search for additional information may be assigned as homework to interested trainees.

Instructors should view any videos that may be identified in the lesson plan before using them to ensure their suitability. The videos can provide teachable moments in both proper and improper work processes and behaviors. Be prepared to stop the videos at appropriate times to point out and discuss both proper and improper conduct and techniques.

Instructors are encouraged to locate additional audiovisual aids available on the Internet, make personal videos, and take photos related to the subject matter and add them to the PowerPoint presentations throughout the program.
The lesson plan for this module is divided into ten 2.5-hour sessions. Each session includes 10 minutes for administrative tasks and one 10-minute break.

**Session One**

Session One reviews residential drawings and introduces commercial drawings, noting the differences between them.

1. Show Session One PowerPoint® presentation slides.
2. Discuss the differences between residential and commercial drawings.
3. Compare and contrast residential and commercial drawings.

**Session Two**

Session Two introduces the different types of drawings included in a set of commercial drawings.

1. Show Session Two PowerPoint® presentation slides.
2. Discuss how sets of commercial drawings are organized.
3. Review the line types used on commercial drawings.
4. Discuss the systematic approach for reviewing a set of drawings.

**Session Three**

Session Three introduces civil drawings and schedules.

1. Show Session Three PowerPoint® presentation slides.
2. Discuss the purpose of site plans for commercial construction.
3. Discuss the use of control points on a construction site.
4. Review a set of site plans and have trainees note the type of information included on the plans.

**Session Four**

Session Four introduces architectural drawings and schedules.

1. Show Session Four PowerPoint® presentation slides.
2. Discuss the types of information included on architectural drawings.
3. Identify types of commercial roofs and show how they are described in architectural drawings.
4. Introduce schedules and have trainees obtain information from them.
5. Have trainees read and interpret architectural drawings.

**Session Five**

Session Five introduces structural drawings and foundation plans.

1. Show Session Five PowerPoint® presentation slides.
2. Discuss the types of information typically located on structural drawings.
3. Discuss the information needed to set foundation forms, and identify the types of foundations commonly used for commercial structures.
4. Have trainees read and interpret structural drawings.

**Session Six**

Session Six introduces framing plans and shop drawings.

1. Show Session Six PowerPoint® presentation slides.
2. Compare and contrast residential and commercial framing methods.
3. Have trainees read and interpret framing plans.
4. Discuss the use of shop drawings for commercial construction.
Session Seven

Session Seven introduces mechanical, electrical, and plumbing (MEP) drawings.

1. Show Session Seven PowerPoint® presentation slides.
2. Introduce mechanical drawings and the types of information shown on them.
3. Have trainees read and interpret mechanical drawings.
4. Introduce electrical drawings and the types of information shown on them.
5. Have trainees read and interpret electrical drawings.
6. Introduce plumbing drawings and the types of information shown on them.
7. Have trainees read and interpret plumbing drawings.

Session Eight

Session Eight introduces trainees to comparing drawings from different disciplines.

1. Show Session Eight PowerPoint® presentation slides.
2. Discuss how coordination drawings are used on commercial construction projects.
3. Review BIM images and explain how this technology has allowed fewer system conflicts on commercial construction projects.

Session Nine

Session Nine introduces commercial specifications.

1. Show Session Nine PowerPoint® presentation slides.
2. Discuss the importance of MasterFormat™ on commercial construction projects.
3. Have trainees read and interpret specifications.

Session Ten

Session Ten is a review and testing session. Have trainees complete the module Review Questions and Trade Terms Quiz. (Alternatively, these may be assigned as homework at the end of Session Nine.) Answer any questions that trainees may have.

1. Have trainees complete the Module Examination. Any outstanding performance testing must be completed during this session.
2. Record the testing results on Training Report Form 200, and submit the report to your Training Program Sponsor.
<table>
<thead>
<tr>
<th>Equipment and Materials</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal protective equipment:</strong></td>
</tr>
<tr>
<td>Architectural drawings</td>
</tr>
<tr>
<td>N/A</td>
</tr>
<tr>
<td>Whiteboard/chalkboard</td>
</tr>
<tr>
<td>Markers/chalk</td>
</tr>
<tr>
<td>Pencils and paper</td>
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<tr>
<td><em>Carpentry Level Two Presentation Slides</em></td>
</tr>
<tr>
<td>Copies of the Module Examination and Performance Profile Sheets</td>
</tr>
<tr>
<td>Vendor-supplied videos/DVDs showing commercial drawings (optional)</td>
</tr>
<tr>
<td>TV/DVD player</td>
</tr>
<tr>
<td>Computer</td>
</tr>
</tbody>
</table>

To the extent possible, and as required for performance testing, provide a selection of the tools listed for each session; alternatively, photos may be used to teach tool identification.
Module Two (27205-13) describes the types and grades of steel framing materials, and includes instructions for selecting and installing metal framing for interior and exterior walls, loadbearing and nonbearing walls, partitions, and other applications.

Objectives

Learning Objective 1
- Identify the tools and components of cold-formed steel framing systems and their safe use.
  a. Identify the safety guidelines that should be followed when working with cold-formed steel.
  b. Identify steel framing materials.
  c. List the steel framing tools and fasteners.
  d. Explain how to perform a material takeoff for a steel frame project.

Learning Objective 2
- Identify the steps to lay out and install a steel stud wall.
  a. Describe the basic steel construction methods.
  b. Explain how to frame nonstructural steel walls.
  c. Explain how to frame structural steel walls.

Learning Objective 3
- Identify other steel framing applications.
  a. Explain how steel framing members are used in floor and roof construction.
  b. Explain how steel framing members are used in ceiling construction.

Performance Tasks

Performance Task 1 (Learning Objective 1)
- Estimate the amount of materials to complete an instructor-specified steel framing project.

Performance Task 2 (Learning Objective 2)
- Lay out a steel stud wall with openings to include bracing and blocking.

Performance Task 3 (Learning Objective 2)
- Demonstrate the ability to build headers (back-to-back, box, and L-header).

Teaching Time: 15 hours
(Six 2.5-hour classroom sessions)
Session time may be adjusted to accommodate your class size, schedule, and teaching style.

Prerequisites
Core Curriculum and Carpentry Level One

Before You Begin
As you prepare for each session, allow sufficient time to review the course objectives, content, visual aids (including the PowerPoint® presentation), and these lesson plans, and to gather the required equipment and materials. Consider time required for demonstrations, laboratories, field trips, and testing.

Using your access code, download the Module Examinations and Performance Profile Sheets from www.nccerirc.com. The passing score for submission into NCCER’s Registry is 70 percent or above for the Module Examination; performance testing is graded pass or fail.
### Safety Considerations

This module requires that trainees work with cold-formed steel framing members, which involves inherent dangers. Safety is paramount in the carpentry trade and safe habits and practices must be emphasized whenever possible. Performance Tasks must be completed under your supervision. Each trainee must use required PPE and follow safe tool practices and procedures.

### Classroom Equipment and Materials

- Whiteboard/chalkboard
- Markers/chalk
- Pencils and paper
- *Carpentry Level Two* PowerPoint® Presentation Slides
- Computer
- Copies of the Module Examination and Performance Profile Sheets
- Vendor-supplied videos/DVDs showing cold-formed steel framing (optional)
- TV/DVD player

### Equipment and Materials for Laboratories and Performance Testing

- Personal protective equipment (PPE):
  - Hard hat
  - Eye protection
  - Cut-resistant gloves
  - Hearing protection
  - Respiratory protection
- Assortment of powder-actuated fasteners
- Assortment of powder-actuated loads
- Assortment of sheet metal screws
- Aviation snips
- Chop saw
- Drive pins
- Framing square
- Furring members
- Hammer
- Hammer drill
- Hole punches
- Hole saws
- Locking C-clamps
- Pneumatic clinching tool
- Powder-actuated tool
- Radius track
- Samples of bridging, blocking, or built-up shapes
- Screwgun
- Sections of framing members with S-T-U-F designator intact
- Selection of steel framing members
- Set of construction drawings
- Simple floor plan
- Slip connectors
- Steel-framing fasteners
- Swivel-head shears
- Tape measure
- Various steel-framing hardware (angles, braces, clips, and tracks)

### Additional Resources and References

This module presents thorough resources for task training. The following resource material is suggested for further study:

- American Iron and Steel Institute (AISI). Provides a variety of resources related to the use of cold-formed steel for construction applications, [http://www.steel.org](http://www.steel.org)
- National Fire Protection Association (NFPA). Works to reduce the worldwide burden of fire and other hazards by providing and advocating codes and standards, research, training, and education, [http://www.nfpa.org](http://www.nfpa.org)
- Steel Framing Alliance (SFA). An advocate of cold-formed steel structures, [http://www.steelframing.org](http://www.steelframing.org)
- Steel Stud Manufacturers Association (SSMA). A manufacturers’ trade group that promotes the use of steel framing members in structures, [http://www.ssma.com](http://www.ssma.com)

There are a number of online resources available for trainees who would like more information on cold-formed steel framing. A search for additional information may be assigned as homework to interested trainees.

Instructors should view any videos that may be identified in the lesson plan before using them to ensure their suitability. The videos can provide teachable moments in both proper and improper work processes and behaviors. Be prepared to stop the videos at appropriate times to point out and discuss both proper and improper conduct and techniques.

Instructors are encouraged to locate additional audiovisual aids available on the Internet, make personal videos, and take photos related to the subject matter and add them to the PowerPoint® presentations throughout the program.
The lesson plan for this module is divided into six 2.5-hour sessions. Each session includes 10 minutes for administrative tasks and one 10-minute break.

**SESSION ONE**

Session One introduces steel framing materials and safety guidelines when working with and around steel.
1. Show Session One PowerPoint® presentation slides.
2. Discuss safety guidelines related to cold-formed steel.
3. Review steel-framing information from Level One.
4. Review the S-T-U-F system for identifying steel framing members, and discuss furring members and slip connectors.

**SESSION TWO**

Session Two introduces steel framing tools and fasteners.
1. Show Session Two PowerPoint® presentation slides.
2. Identify and discuss tools commonly used for steel framing.
3. Explain how steel framing members are attached to one another and to other construction materials.
4. Discuss and demonstrate a powder-actuated tool and fasteners.

**SESSION THREE**

Session Three introduces estimating and laying out steel-framed walls.
1. Show Session Three PowerPoint® presentation slides.
2. Discuss how steel-framed assemblies are estimated. Provide each trainee with a simple floor plan for a steel-framed building, and have them estimate the proper material quantities.
3. Discuss the general construction principles of steel-framed buildings.

**SESSION FOUR**

Session Four introduces framing nonstructural steel walls.
1. Show Session Four PowerPoint® presentation slides.
2. Identify and discuss types of nonstructural steel walls.
3. Discuss methods of building and the bracing required for nonstructural steel walls.

**SESSION FIVE**

Session Five introduces framing structural steel walls.
1. Show Session Five PowerPoint® presentation slides.
2. Discuss the layout of structural steel walls. Have each trainee lay out a steel-framed wall with openings, including bracing and blocking.
3. Discuss the assembly and erection of headers and structural steel walls. Have trainees construct back-to-back, box, and L-headers.

**SESSION SIX**

Session Six is a review and testing session. Have trainees complete the module Review Questions and Trade Terms Quiz. (Alternatively, these may be assigned as homework at the end of Session Five.) Answer any questions that trainees may have.
1. Have trainees complete the Module Examination. Any outstanding performance testing must be completed during this session.
2. Record the testing results on Training Report Form 200, and submit the report to your Training Program Sponsor.
## Materials Checklist for Module 27205-13, Cold-Formed Steel Framing

<table>
<thead>
<tr>
<th>Personal protective equipment:</th>
<th>Aviation snips</th>
<th>Hammer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hard hat</td>
<td>Chop saw</td>
<td>Hammer drill</td>
</tr>
<tr>
<td>Eye protection</td>
<td>Drive pins</td>
<td>Hole punches</td>
</tr>
<tr>
<td>Cut-resistant gloves</td>
<td>Framing square</td>
<td>Hole saws</td>
</tr>
<tr>
<td>Hearing protection</td>
<td>Furring members</td>
<td>Locking C-clamps</td>
</tr>
<tr>
<td>Respiratory protection</td>
<td>Powder-actuated tool</td>
<td>Pneumatic clinching tool</td>
</tr>
<tr>
<td>Whiteboard/chalkboard</td>
<td>Set of construction drawings</td>
<td>Steel-framing fasteners</td>
</tr>
<tr>
<td>Markers/chalk</td>
<td>Simple floor plan</td>
<td>Swivel-head shears</td>
</tr>
<tr>
<td>Pencils and paper</td>
<td>Slip connectors</td>
<td>Tape measure</td>
</tr>
</tbody>
</table>

### Carpenter Level Two

**PowerPoint® Presentation**

- **Slides**
  - Various steel-framing hardware (angles, braces, clips, and tracks)
  - Selection of steel framing members
  - Samples of bridging, blocking, or built-up shapes
  - Assortment of powder-actuated fasteners
  - Assortment of powder-actuated loads

**Computer**

- Screwgun
- Radius track

**Copies of the Module Examination and Performance Profile Sheets**

- Assortment of sheet metal screws

**Vendor-supplied videos/DVDs showing cold-formed steel framing (optional)**

**TV/DVD player**

- Assortment of powder-actuated fasteners

To the extent possible, and as required for performance testing, provide a selection of the tools listed for each session; alternatively, photos may be used to teach tool identification.
Module Three (27204-13) covers the various types of exterior finish materials and their installation procedures, including wood, metal, vinyl, and fiber-cement siding.

### Objectives

**Learning Objective 1**
- Describe the safety hazards when working with exterior finish materials.
  - a. Identify safety hazards that are present when working at elevations.
  - b. Describe safety hazards when working with hand and power tools, equipment, and exterior finish materials.

**Learning Objective 2**
- Describe the various types and applications of exterior finish materials.
  - a. Identify the types of wood siding.
  - b. Identify vinyl and metal siding materials and components.
  - c. List applications for fiber-cement siding.
  - d. Discuss the types of veneer finishes.
  - e. List specialty exterior finishes.
  - f. Explain the purpose of flashing.

**Learning Objective 3**
- Explain how to install exterior finish materials.
  - a. Describe surface preparation that must be performed prior to installing exterior finish materials.
  - b. Discuss the types of furring and insulation that might be applied to exterior walls.
  - c. Explain how to establish a straight reference line.
  - d. Describe how to install wood siding.
  - e. Describe how to install vinyl and metal siding.
  - f. Describe how to install fiber-cement siding.
  - g. Explain how to install cornices.

**Learning Objective 4**
- Describe the estimating procedure for exterior finish projects.
  - a. Explain how to perform a takeoff on panel and board siding.

### Performance Tasks

**Performance Task 1** (Learning Objective 3)
- Install three of the most common siding types in your area.

**Performance Task 2** (Learning Objective 4)
- Estimate the amount of lap or panel siding required for a structure.

### Teaching Time: 35 hours

(Fourteen 2.5-hour classroom sessions)

Session time may be adjusted to accommodate your class size, schedule, and teaching style.

### Prerequisites

Core Curriculum and Carpentry Level One

### Before You Begin

As you prepare for each session, allow sufficient time to review the course objectives, content, visual aids (including the PowerPoint® presentation), and these lesson plans, and to gather the required equipment and materials. Consider time required for demonstrations, laboratories, field trips, and testing.

Using your access code, download the Module Examinations and Performance Profile Sheets from www.nccerirc.com. The passing score for submission into NCCER’s Registry is 70 percent or above for the Module Examination; performance testing is graded pass or fail.
Safety Considerations
This module requires that trainees work at elevated locations, work with hand and power tools, and work around fiber-cement siding. Safety is paramount in the carpentry trade and safe habits and practices must be emphasized whenever possible. Performance Tasks must be completed under your supervision. Each trainee must use required PPE and follow safe tool practices and procedures.

Classroom Equipment and Materials
- Whiteboard/chalkboard
- Markers/chalk
- Pencils and paper
- **Carpentry Level Two PowerPoint® Presentation Slides**
- Computer
- Copies of the Module Examination and Performance Profile Sheets
- Vendor-supplied videos/DVDs showing exterior finishing materials and installations (optional)
- TV/DVD player

Equipment and Materials for Laboratories and Performance Testing
- Personal protective equipment (PPE):
  - Hard hat
  - Eye protection
  - Fall protection, including body harness and lanyard
  - Gloves
  - Hearing protection
  - Respiratory protection
- 3/8”- or 1/2”-thick hardwood stock
- Aerial lift
- Assortment of vinyl and metal siding components
- Aviation snips
- Calculator
- Caulking gun
- Chalk box and chalkline
- Circular saw
- Duckbill snips
- Hacksaw
- Hammer
- Handsaw
- Ladder
- Lanyard
- Laser level
- Photographs of residential structures finished with wood siding
- Photographs of veneer finishes
- Portable brake
- Power nailer
- Power shears
- Rubber mallet
- Safety data sheets (SDSs) for fiber-cement siding
- Samples of fiber-cement siding
- Samples of flashing
- Samples of furring strips
- Samples of inside and outside corners of wood siding
- Samples of underlayment
- Samples of various types of wood siding
- Scaffold
- Screwdriver
- Set of residential construction drawings
- Shingle hatchet
- Siding installation tools
- Snaplock punch
- Table saw
- Tape measure
- Tin snips
- Utility knife
- Water level

Additional Resources and References
This module presents thorough resources for task training. The following resource material is suggested for further study:

Vinyl Siding Institute website. [www.vinylsiding.org](http://www.vinylsiding.org)

Cedar Shake & Shingle Bureau website. [www.cedarbureau.org](http://www.cedarbureau.org)

There are a number of online resources available for trainees who would like more information on exterior finishing. A search for additional information may be assigned as homework to interested trainees.

Instructors should view any videos that may be identified in the lesson plan before using them to ensure their suitability. The videos can provide teachable moments in both proper and improper work processes and behaviors. Be prepared to stop the videos at appropriate times to point out and discuss both proper and improper conduct and techniques.

Instructors are encouraged to locate additional audiovisual aids available on the Internet, make personal videos, and take photos related to the subject matter and add them to the PowerPoint® presentations throughout the program.
Session Outline for 27204-13

EXTERIOR FINISHING

The lesson plan for this module is divided into fourteen 2.5-hour sessions. Each session includes 10 minutes for administrative tasks and one 10-minute break.

**SESSION ONE**

Session One introduces exterior finishing safety.

1. Show Session One PowerPoint® presentation slides.
2. Identify safety hazards that are present when working at elevations, and review the use of personal fall arrest equipment.
3. Describe safety hazards when working with hand and power tools, equipment, and exterior finishing materials. Review the use of safety data sheets (SDSs).

**SESSION TWO**

Session Two introduces types of wood siding.

1. Show Session Two PowerPoint® presentation slides.
2. Discuss the use of beveled, board-and-batten, reverse batten, board-on-board, tongue-and-groove, shiplap, shingle, shake, and plywood siding.

**SESSION THREE**

Session Three introduces types of siding other than wood, including vinyl and metal siding, fiber-cement siding, veneer finishes, and specialty finishes.

1. Show Session Three PowerPoint® presentation slides.
2. Discuss the use of types of siding other than wood, including vinyl and metal siding, fiber-cement siding, veneer finishes, and specialty finishes.
3. Discuss the use of flashing for vertical surfaces.

**SESSION FOUR**

Session Four introduces surface preparation and furring and insulation techniques.

1. Show Session Four PowerPoint® presentation slides.
2. Identify items to consider when preparing a surface for exterior finishing materials.
3. Discuss the purpose of furring strips for exterior finish and the importance of properly installing furring members and insulation.

**SESSION FIVE**

Session Five introduces establishing a straight reference line and installing beveled siding.

1. Show Session Five PowerPoint® presentation slides.
2. Discuss the importance of establishing a straight reference line.
3. Show how beveled siding is installed and have trainees do it.

**SESSION SIX**

Session Six introduces installing board-and-batten siding, tongue-and-groove siding, shiplap siding, shakes and shingles, and plywood siding.

1. Show Session Six PowerPoint® presentation slides.
2. Discuss the proper procedure for installing board-and-batten siding, tongue-and-groove siding, shiplap siding, shakes, shingles, and plywood siding.
3. Have trainees properly install board-and-batten siding, tongue-and-groove siding, shiplap siding, shakes, shingles, and plywood siding are installed.
Session Outline for 27204-13

**Exterior Finishing**

**Session Seven**
Session Seven introduces installing vinyl and metal siding components.
1. Show Session Seven PowerPoint® presentation slides.
2. Review tools and equipment needed when installing vinyl and metal siding.
3. Discuss and show the installation of corner posts and starter strips.

**Session Eight**
Session Eight introduces trimming out gable ends and around doors and windows, and cutting vinyl and metal siding.
1. Show Session Eight PowerPoint® presentation slides.
2. Discuss and show how gable ends and doors and windows are trimmed out prior to installing siding.
3. Discuss and show how to cut vinyl and metal siding.

**Session Nine**
Session Nine introduces installing vinyl and metal siding.
1. Show Session Nine PowerPoint® presentation slides.
2. Discuss and show how to install vinyl and metal siding.
3. Demonstrate how to install siding around windows and doors.
4. Have trainees properly install vinyl and metal siding.

**Session Ten**
Session Ten introduces installing vinyl and metal siding at gable ends and under the eaves. The session concludes with caulking and cleanup.
1. Show Session Ten PowerPoint® presentation slides.
2. Discuss and show how vinyl and metal siding are installed at gable ends and under the eaves.
3. Discuss the proper procedure for caulking and cleaning up vinyl and metal siding.

**Session Eleven**
Session Eleven introduces installing fiber-cement siding.
1. Show Session Eleven PowerPoint® presentation slides.
2. Discuss PPE that should be worn when working with fiber-cement siding.
3. Discuss and show the proper method for cutting and installing fiber-cement siding.
4. Have trainees properly install fiber-cement siding.

**Session Twelve**
Session Twelve introduces installing cornices, fascia, and soffits.
1. Show Session Twelve PowerPoint® presentation slides.
2. Discuss the types of cornices.
3. Explain how the fascia and soffits are installed.
4. Discuss and show how to construct a box cornice.
SESSION THIRTEEN

Session Thirteen introduces estimating exterior finish materials.

1. Show Session Thirteen PowerPoint® presentation slides.
2. Review the formulas for calculating area.
3. Discuss and show how to determine the amount of siding required for a building.
4. Have trainees determine the amount of siding required for a residential structure.

SESSION FOURTEEN

Session Fourteen is a review and testing session. Have trainees complete the module Review Questions and Trade Terms Quiz. (Alternatively, these may be assigned as homework at the end of Session Thirteen.) Answer any questions that trainees may have.

1. Have trainees complete the Module Examination. Any outstanding performance testing must be completed during this session.
2. Record the testing results on Training Report Form 200, and submit the report to your Training Program Sponsor.
## Materials Checklist for Module 27204-13, Exterior Finishing

<table>
<thead>
<tr>
<th>Equipment and Materials</th>
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<th>⅛”- or ⅜”-thick hardwood stock</th>
<th>Chalk box and chalkline</th>
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<tbody>
<tr>
<td>Hard hat</td>
<td>Aerial lift</td>
<td>Circular saw</td>
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</tr>
<tr>
<td>Eye protection</td>
<td>Samples of flashing</td>
<td>Duckbill snips</td>
<td></td>
</tr>
<tr>
<td>Fall protection, including body harness and lanyard</td>
<td>Aviation snips</td>
<td>Hacksaw</td>
<td></td>
</tr>
<tr>
<td>Gloves</td>
<td>Water level</td>
<td>Hammer</td>
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<td>Hearing protection</td>
<td>Calculator</td>
<td>Handsaw</td>
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<td>Respiratory protection</td>
<td>Caulking gun</td>
<td>Ladder</td>
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<td>Lanyard</td>
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</tr>
<tr>
<td>Markers/chalk</td>
<td>photographs of veneer finishes</td>
<td>Laser level</td>
<td></td>
</tr>
<tr>
<td>Pencils and paper</td>
<td>Portable brake</td>
<td>Samples of fiber-cement siding</td>
<td></td>
</tr>
<tr>
<td><strong>Carpentry Level Two</strong></td>
<td><strong>PowerPoint® Presentation</strong></td>
<td><strong>Slides</strong></td>
<td></td>
</tr>
<tr>
<td>TV/DVD player</td>
<td>Power shears</td>
<td>Samples of furring strips</td>
<td></td>
</tr>
<tr>
<td>Computer</td>
<td>Rubber mallet</td>
<td>Tape measure</td>
<td></td>
</tr>
<tr>
<td>Copies of the Module Examination and Performance Profile Sheets</td>
<td>Safety data sheets (SDSs) for fiber-cement siding</td>
<td>Samples of inside and outside corners of wood siding</td>
<td></td>
</tr>
<tr>
<td>Vendor-supplied videos/DVDs showing exterior finishing materials and installations (optional)</td>
<td>Photographs of residential structures finished with wood siding</td>
<td>Samples of various types of wood siding</td>
<td></td>
</tr>
<tr>
<td>Screwdriver</td>
<td>Siding installation tools</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shingle hatchet</td>
<td>Snaplock punch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Tin snips</td>
<td>Table saw</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Utility knife</td>
<td>Samples of underlayment</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Power nailer</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To the extent possible, and as required for performance testing, provide a selection of the tools listed for each session; alternatively, photos may be used to teach tool identification.
Module Four (27203-13) covers the selection and installation of various types of insulating materials in walls, floors, and attics. It also covers the uses and installation practices for vapor barriers and waterproofing materials.

**Objectives**

**Learning Objective 1**
- Describe the safety and health hazards when working with insulation.
  a. List the personal protective equipment (PPE) that is required when working with insulation.
  b. Describe how to safely handle insulation.

**Learning Objective 2**
- Describe the various types of insulation and their characteristics.
  a. Explain how to determine R-value requirements.
  b. Describe flexible insulation and list its characteristics.
  c. Describe loose-fill insulation and list its characteristics.
  d. Describe rigid or semirigid insulation and list its characteristics.
  e. Describe reflective insulation and list its characteristics.
  f. List miscellaneous types of insulation.

**Learning Objective 3**
- Describe the various installation methods for insulation.
  a. Explain how to install flexible insulation.
  b. Explain how to install loose-fill insulation.
  c. Explain how to install rigid or semirigid insulation.
  d. Explain how to install reflective insulation.

**Learning Objective 4**
- Identify the requirements for moisture control, waterproofing, and ventilation, and describe the related installation methods.
  a. List various methods to control moisture in a structure.
  b. Identify methods to waterproof a structure.

**Learning Objective 5**
- Describe the estimating procedure for thermal and moisture projects.

**Performance Tasks**

**Performance Task 1** (Learning Objective 3)
- Install blanket insulation in a wall.

**Performance Task 2** (Learning Objective 3)
- Install a vapor barrier on a wall.

**Performance Task 3** (Learning Objective 4)
- Install selected building wraps.

**Teaching Time:** 7.5 hours
(Three 2.5-hour classroom sessions)
Session time may be adjusted to accommodate your class size, schedule, and teaching style.

**Prerequisites**
*Core Curriculum and Carpentry Level One*

**Before You Begin**
As you prepare for each session, allow sufficient time to review the course objectives, content, visual aids (including the PowerPoint® presentation), and these lesson plans, and to gather the required equipment and materials. Consider time required for demonstrations, laboratories, field trips, and testing.

Using your access code, download the Module Examinations and Performance Profile Sheets from [www.nccerirc.com](http://www.nccerirc.com). The passing score for submission into NCCER’s Registry is 70 percent or above for the Module Examination; performance testing is graded pass or fail.
### Classroom Equipment and Materials
- Whiteboard/chalkboard
- Markers/chalk
- Pencils and paper
- Carpentry Level Two PowerPoint® Presentation Slides
- Computer
- Copies of the Module Examination and Performance Profile Sheets
- Vendor-supplied videos/DVDs showing thermal and moisture protection applications (optional)
- TV/DVD player

### Equipment and Materials for Laboratories and Performance Testing
- Personal protective equipment (PPE):
  - Eye protection
  - Gloves
  - Respiratory protection
- Building wrap
- Hand stapler
- Heat box
- Heat lamp
- Measuring tape
- Photographs of mold- or mildew-damaged buildings
- Photographs of water-damaged buildings
- Power stapler
- Safety data sheets (SDSs) for various types of insulation
- Samples of various types of insulation, including flexible, loose-fill, rigid or semirigid, and reflective insulation
- Utility knife
- Various types of vapor barriers

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### Safety Considerations
This module requires that trainees work with insulation, which may require special PPE. Safety is paramount in the carpentry trade and safe habits and practices must be emphasized whenever possible. Performance Tasks must be completed under your supervision. Each trainee must use required PPE and follow safe tool practices and procedures.

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### Additional Resources and References
This module presents thorough resources for task training. The following resource material is suggested for further study:


There are a number of online resources available for trainees who would like more information on thermal and moisture protection. A search for additional information may be assigned as homework to interested trainees.

Instructors should view any videos that may be identified in the lesson plan before using them to ensure their suitability. The videos can provide teachable moments in both proper and improper work processes and behaviors. Be prepared to stop the videos at appropriate times to point out and discuss both proper and improper conduct and techniques.

Instructors are encouraged to locate additional audiovisual aids available on the Internet, make personal videos, and take photos related to the subject matter and add them to the PowerPoint® presentations throughout the program.
## Session Outline for 27203-13

### Thermal and Moisture Protection

The lesson plan for this module is divided into three 2.5-hour sessions. Each session includes 10 minutes for administrative tasks and one 10-minute break.

### Session One

Session One introduces types of insulation, insulation safety and health hazards and installation methods for various types of insulation.

1. Show Session One PowerPoint® presentation slides.
2. Discuss PPE required for insulation installation and safety data sheets (SDSs).
3. Identify various types of insulation, their properties and characteristics, and the methods of installation. Have trainees demonstrate insulation installation.

### Session Two

Session Two introduces moisture control, waterproofing, and estimating insulation needs.

1. Show Session Two PowerPoint® presentation slides.
2. Identify and discuss sources of water infiltration. Demonstrate how vapor barriers are installed and have trainees do it.
3. Identify and discuss sources of air infiltration, and discuss building wrap.
4. Demonstrate how building wrap is installed and have trainees do it.
5. Discuss how to estimate the amount of insulation required.

### Session Three

Session Three is a review and testing session. Have trainees complete the module Review Questions and Trade Terms Quiz. (Alternatively, these may be assigned as homework at the end of Session Two.) Answer any questions that trainees may have.

1. Have trainees complete the Module Examination. Any outstanding performance testing must be completed during this session.
2. Record the testing results on Training Report Form 200, and submit the report to your Training Program Sponsor.
# Materials Checklist for Module 27203-13, Thermal and Moisture Protection

<table>
<thead>
<tr>
<th>Equipment and Materials</th>
<th>Building wrap</th>
<th>Measuring tape</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal protective equipment:</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Eye protection</td>
<td>Hand stapler</td>
<td>Power stapler</td>
</tr>
<tr>
<td>Gloves</td>
<td>Heat box</td>
<td>Various types of vapor barriers</td>
</tr>
<tr>
<td>Respiratory protection</td>
<td>Heat lamp</td>
<td>Utility knife</td>
</tr>
<tr>
<td>Whiteboard/chalkboard</td>
<td>Photographs of mold- or mildew-damaged buildings</td>
<td>Safety data sheets (SDSs) for various types of insulation</td>
</tr>
<tr>
<td>Markers/chalk</td>
<td>Samples of various types of insulation, including flexible, loose-fill, rigid or semirigid, and reflective insulation</td>
<td>Photographs of water-damaged buildings</td>
</tr>
<tr>
<td>Pencils and paper</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Carpentry Level Two PowerPoint® Presentation Slides</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>TV/DVD player</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Computer</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Copies of the Module Examination and Performance Profile Sheets</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vendor-supplied videos/DVDs showing thermal and moisture protection applications (optional)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

To the extent possible, and as required for performance testing, provide a selection of the tools listed for each session; alternatively, photos may be used to teach tool identification.
Module Five (27202-13) describes how to properly prepare the roof deck and install roofing for residential and commercial buildings.

Objectives

Learning Objective 1
- Explain the safety requirements for roofing projects.
  a. Identify potential hazards when working on roofs.
  b. Discuss the fall protection equipment required when working on roofs.
  c. Identify proper personal protective equipment (PPE) and hazard control devices used when working on roofs.

Learning Objective 2
- Identify the tools and fasteners used in roofing.
  a. Identify the hand tools used when working on roofing projects.
  b. Identify the power tools used when working on roofing projects.
  c. Identify fasteners used on roofing projects.

Learning Objective 3
- Identify the different roofing systems and their associated materials.
  a. Identify composition shingles and their applications.
  b. Identify roll-roofing applications.
  c. Identify wood shakes and shingles and their applications.
  d. Identify tile/slate roofing materials and their applications.
  e. Identify metal roofing and its applications.
  f. Identify built-up roofing and its applications.
  g. Identify single-ply roofing and its applications.
  h. Explain the purpose of underlayment and waterproof membrane.
  i. Discuss the purpose of drip edge, flashing, and roof ventilation.

Learning Objective 4
- Describe the installation techniques for common roofing systems.
  a. Describe how to properly prepare a roof deck.
  b. Explain how to install composition shingles.
  c. Explain how to install metal roofing.
  d. Describe how to install roll roofing.
  e. Discuss roof projections, flashing, and ventilation.

Learning Objective 5
- Describe the estimating procedure for roofing projects.

Performance Tasks

Performance Task 1 (Learning Objective 4)
- Demonstrate how to install composition shingles on a specified roof and valley.

Performance Task 2 (Learning Objective 4)
- Demonstrate the method to properly cut and install the ridge cap using composition shingles.

Performance Task 3 (Learning Objective 4)
- Lay out, cut, and install a cricket or saddle.

Performance Task 4 (Learning Objective 4)
- Demonstrate the techniques for installing other selected types of roofing materials.

Teaching Time: 25 hours
(Ten 2.5-hour classroom sessions)
Session time may be adjusted to accommodate your class size, schedule, and teaching style.

Prerequisites
Core Curriculum and Carpentry Level One

Before You Begin
As you prepare for each session, allow sufficient time to review the course objectives, content, visual aids (including the PowerPoint® presentation), and these lesson plans, and to gather the required equipment and materials. Consider time required for demonstrations, laboratories, field trips, and testing.

Using your access code, download the Module Examinations and Performance Profile Sheets from www.nccerirc.com. The passing score for submission into NCCER’s Registry is 70 percent or above for the Module Examination; performance testing is graded pass or fail.
### Classroom Equipment and Materials
- Whiteboard/chalkboard
- Markers/chalk
- Pencils and paper
- *Carpentry Level Two* PowerPoint® Presentation Slides
- Computer
- Copies of the Module Examination and Performance Profile Sheets
- Vendor-supplied videos/DVDs showing roofing applications (optional)
- TV/DVD player

### Equipment and Materials for Laboratories and Performance Testing
- Personal protective equipment (PPE):
  - Hard hat
  - Eye protection
  - Hearing protection
  - Fall protection, including body harness and lanyard
  - Gloves
- Assortment of fasteners used for roofing
- Assortment of flashing
- Assortment of hand and power roofing tools
- Assortment of vents
- Aviation snips
- Body harness
- Calculator
- Composition shingles
- Extension ladder
- Frame scaffold
- Framing square
- Hammer
- Ladder
- Measuring tape
- Metal roofing
- Photographs of various commercial roofs
- Photographs of various residential roofing systems
- Roll roofing
- Roof plan for a hip roof
- Roofing brackets
- Roofing nails
- Samples of built-up roofing
- Samples of composition shingles
- Samples of drip edges, flashing, and roof vents
- Samples of metal roofing
- Samples of roll roofing
- Samples of tile/slate roofing
- Samples of underlayment and waterproof membranes
- Samples of wood shakes and shingles
- Sets of constructions drawings, including residential and commercial drawings
- Tin ships
- Utility knife

### Additional Resources and References
This module presents thorough resources for task training. The following resource material is suggested for further study:

- Asphalt Manufacturers Association website. [www.asphaltroofing.org](http://www.asphaltroofing.org)
- National Roofing Contractors Association website. [www.nrca.net](http://www.nrca.net)
- Roof Coating Manufacturers Association website. [www.roofcoatings.org](http://www.roofcoatings.org)

There are a number of online resources available for trainees who would like more information on roofing applications. A search for additional information may be assigned as homework to interested trainees.

Instructors should view any videos that may be identified in the lesson plan before using them to ensure their suitability. The videos can provide teachable moments in both proper and improper work processes and behaviors. Be prepared to stop the videos at appropriate times to point out and discuss both proper and improper conduct and techniques.

Instructors are encouraged to locate additional audiovisual aids available on the Internet, make personal videos, and take photos related to the subject matter and add them to the PowerPoint® presentations throughout the program.
The lesson plan for this module is divided into ten 2.5-hour sessions. Each session includes 10 minutes for administrative tasks and one 10-minute break.

**SESSION ONE**

Session One introduces roofing safety.

1. Show Session One PowerPoint® presentation slides.
2. Identify safety hazards associated with roofing projects.
3. Review OSHA regulations regarding working at elevations.
4. Review fall protection and personal fall arrest equipment used for roofing.

**SESSION TWO**

Session Two introduces roofing tools and fasteners.

1. Show Session Two PowerPoint® presentation slides.
2. Review general safety guidelines and introduce safety guidelines pertaining to roofing projects.
3. Demonstrate the safe use of hand and power tools.

**SESSION THREE**

Session Three introduces roofing systems and materials.

1. Show Session Three PowerPoint® presentation slides.
2. Discuss the various types of roofing systems and roofing materials that may be used for each.
3. Show trainees different types of roofing materials.

**SESSION FOUR**

Session Four introduces roof deck preparation and installation of composition shingles on gable roofs.

1. Show Session Four PowerPoint® presentation slides.
2. Discuss and demonstrate how to properly prepare a roof deck for various types of roofing materials.
3. Discuss the proper installation of composition shingles on various types of roofs.
4. Demonstrate how composition shingles are installed on various types of roofs. Have trainees properly install composition shingles on gable roofs.

**SESSION FIVE**

Session Five introduces installation of composition shingles on hip roofs.

1. Show Session Five PowerPoint® presentation slides.
2. Discuss the proper installation of composition shingles on hip roofs.
3. Demonstrate how composition shingles are installed on hip roofs. Have trainees properly install composition shingles on hip roofs.

**SESSION SIX**

Session Six introduces installation of metal roofing.

1. Show Session Six PowerPoint® presentation slides.
2. Discuss the proper installation of metal roofing.
3. Demonstrate how metal roofing is installed. Have trainees properly install metal roofing on gable and hip roofs.
**SESSION SEVEN**

Session Seven introduces installation of roll roofing.

1. Show Session Seven PowerPoint® presentation slides.
2. Discuss the proper installation of roll roofing.
3. Demonstrate how roll roofing is installed. Have trainees properly install roll roofing on gable and hip roofs.

**SESSION EIGHT**

Session Eight introduces roofing projections, ridge rows, flashing, and ventilation.

1. Show Session Eight PowerPoint® presentation slides.
2. Discuss chimney projections through roofs, and demonstrate how to properly install saddles (crickets) for a chimney projection. Have trainees properly install saddles.
3. Discuss and demonstrate how to properly install ridge rows on gable and hip roofs.
4. Explain the importance of properly flashing a roof.
5. Discuss and demonstrate how to properly install box and ridge vents. Have trainees demonstrate the proper method of installing box and ridge vents.

**SESSION NINE**

Session Nine introduces trainees to estimating roofing materials.

1. Show Session Nine PowerPoint® presentation slides.
2. Demonstrate how to calculate the roof area.
3. Demonstrate how to calculate the roofing material required for a given roof. Have trainees estimate the amount of roofing material required for a simple gable roof.

**SESSION TEN**

Session Ten is a review and testing session. Have trainees complete the module Review Questions and Trade Terms Quiz. (Alternatively, these may be assigned as homework at the end of Session Nine.) Answer any questions that trainees may have.

1. Have trainees complete the Module Examination. Any outstanding performance testing must be completed during this session.
2. Record the testing results on Training Report Form 200, and submit the report to your Training Program Sponsor.
## Materials Checklist for Module 27202-13, Roofing Applications

<table>
<thead>
<tr>
<th>Equipment and Materials</th>
<th>Assortment of flashing</th>
<th>Samples of metal roofing</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal protective equipment:</strong></td>
<td>Hard hat</td>
<td>Frame scaffold</td>
</tr>
<tr>
<td>Eye protection</td>
<td>Assortment of vents</td>
<td>Roll roofing</td>
</tr>
<tr>
<td>Hearing protection</td>
<td>Aviation snips</td>
<td>Roof plan for a hip roof</td>
</tr>
<tr>
<td>Fall protection, including body harness and lanyard</td>
<td>Calculator</td>
<td>Roofing brackets</td>
</tr>
<tr>
<td>Gloves</td>
<td>Composition shingles</td>
<td>Roofing nails</td>
</tr>
<tr>
<td><strong>Whiteboard/chalkboard</strong></td>
<td>Extension ladder</td>
<td>Samples of built-up roofing</td>
</tr>
<tr>
<td><strong>Markers/chalk</strong></td>
<td>Samples of drip edges, flashing, and roof vents</td>
<td>Tin ships</td>
</tr>
<tr>
<td><strong>Pencils and paper</strong></td>
<td>Framing square</td>
<td>Utility knife</td>
</tr>
<tr>
<td><strong>Carpentry Level Two</strong></td>
<td><strong>PowerPoint® Presentation Slides</strong></td>
<td>Hammer</td>
</tr>
<tr>
<td>Computer</td>
<td>Assortment of hand and power roofing tools</td>
<td>Samples of roll roofing</td>
</tr>
<tr>
<td><strong>Copies of the Module Examination and Performance Profile Sheets</strong></td>
<td>Photographs of various residential roofing systems</td>
<td>Samples of tile/slate roofing</td>
</tr>
<tr>
<td><strong>Vendor-supplied videos/DVDs showing roofing applications (optional)</strong></td>
<td>Measuring tape</td>
<td>Samples of underlayment and waterproof membranes</td>
</tr>
<tr>
<td><strong>TV/DVD player</strong></td>
<td>Samples of composition shingles</td>
<td>Samples of wood shakes and shingles</td>
</tr>
<tr>
<td></td>
<td>Photographs of various commercial roofs</td>
<td>Ladder</td>
</tr>
</tbody>
</table>

To the extent possible, and as required for performance testing, provide a selection of the tools listed for each session; alternatively, photos may be used to teach tool identification.
Module Six (27208-13) describes the installation of metal doors and related hardware in steel-framed, wood-framed, and masonry walls, along with their related hardware, such as locksets and door closers. A discussion on the installation of wood doors, folding doors, and pocket doors is also presented.

**Objectives**

**Learning Objective 1**
- Describe the safety hazards related to working with doors.

**Learning Objective 2**
- Identify the different types and composition of residential and commercial doors.
  a. Identify the different types and composition of residential doors.
  b. Identify the different types and composition of commercial doors.

**Learning Objective 3**
- Identify the various types of door jambs and frames.
  a. Describe the uses and benefits of wood door jambs and frames.
  b. Describe the uses and benefits of metal door jambs and frames.

**Learning Objective 4**
- Identify the different types of door hardware.
  a. Identify the different types of door hardware used in residential applications.
  b. Identify the different types of door hardware used in commercial applications.

**Learning Objective 5**
- Describe the various installation techniques for doors and hardware.
  a. Describe the various installation techniques for residential doors and hardware.
  b. Describe the various installation techniques for commercial doors and hardware.

**Learning Objective 6**
- List and identify specific items included on a typical door schedule.
  a. Describe the hardware finish classifications.
  b. Describe the information included in a typical door schedule.

**Performance Tasks**

**Performance Task 1** (Learning Objective 5)
- Demonstrate the proper installation of a hollow metal frame and door using the proper safety precautions.

**Performance Task 2** (Learning Objective 5)
- Install a prehung door unit or door hanging system using the proper safety precautions.

**Performance Task 3** (Learning Objective 5)
- Lay out and cut hinges in an instructor-selected project.

**Performance Task 4** (Learning Objective 5)
- Install a door closer using the proper safety precautions.

**Teaching Time: 20 hours**
(Eight 2.5-hour classroom sessions)
Session time may be adjusted to accommodate your class size, schedule, and teaching style.

**Prerequisites**
*Core Curriculum* and *Carpentry Level One.*

**Before You Begin**
As you prepare for each session, allow sufficient time to review the course objectives, content, visual aids (including the PowerPoint® presentation), and these lesson plans, and to gather the required equipment and materials. Consider time required for demonstrations, laboratories, field trips, and testing.

Using your access code, download the Module Examinations and Performance Profile Sheets from [www.nccerirc.com](http://www.nccerirc.com). The passing score for submission into NCCER's Registry is 70 percent or above for the Module Examination; performance testing is graded pass or fail.
**Safety Considerations**

This module requires that trainees lift doors and work with sharp cutting tools. Safety is paramount in the carpentry trade and safe habits and practices must be emphasized whenever possible. Performance Tasks must be completed under your supervision. Each trainee must use required PPE and follow safe tool practices and procedures.

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**Classroom Equipment and Materials**

- Whiteboard/chalkboard
- Markers/chalk
- Pencils and paper
- *Carpentry Level Two* PowerPoint® Presentation Slides
- Computer
- Copies of the Module Examination and Performance Profile Sheets
- Vendor-supplied videos/DVDs showing doors and door hardware (optional)
- TV/DVD player

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**Equipment and Materials for Laboratories and Performance Testing**

- Personal protective equipment (PPE):
  - Hard hat
  - Eye protection
  - Gloves
- Assortment of commercial door hinges
- Assortment of commercial locksets
- Assortment of external door stops, door holders, and door closers
- Assortment of finish nails
- Assortment of residential door hinges
- Assortment of residential locksets
- Assortment of screws
- Assortment of security hardware
- Assortment of touch-bar or crossbar hardware
- Assortment of weather stripping and thresholds
- Butt-hinge template
- Carpet samples
- Chisel
- Circular saw
- Commercial doors
- Door closers
- Door cutaways
- Door-stop strips
- Drill
- Drill bits
- Finish nails
- Hinges
- Locksets
- Masking tape
- Nails
- Photographs of rough-framed buildings
- Photographs of various types of residential doors
- Prehung doors
- Residential doors
- Router and bits
- Samples of metal door jambs
- Samples of wood door jambs
- Scrap lumber (2 × 4s, 2 × 6s, etc.)
- Set of commercial construction drawings with a door schedule
- Unassembled metal door frames
- Welded metal door frames
- Wood door jambs

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**Additional Resources and References**

This module presents thorough resources for task training. The following resource material is suggested for further study:


There are a number of online resources available for trainees who would like more information on doors and door hardware. A search for additional information may be assigned as homework to interested trainees.

Instructors should view any videos that may be identified in the lesson plan before using them to ensure their suitability. The videos can provide teachable moments in both proper and improper work processes and behaviors. Be prepared to stop the videos at appropriate times to point out and discuss both proper and improper conduct and techniques.

Instructors are encouraged to locate additional audiovisual aids available on the Internet, make personal videos, and take photos related to the subject matter and add them to the PowerPoint presentations throughout the program.
Session Outline for 27208-13

DOORS AND DOOR HARDWARE

The lesson plan for this module is divided into eight 2.5-hour sessions. Each session includes 10 minutes for administrative tasks and one 10-minute break.

SESSION ONE
Session One introduces doors and installation safety.
1. Show Session One PowerPoint® presentation slides.
2. Discuss safety hazards related to door installation.
3. Discuss construction of doors and door hand or door swing.
4. Provide an overview of residential and commercial doors.

SESSION TWO
Session Two introduces wood door jambs and frames.
1. Show Session Two PowerPoint® presentation slides.
2. Identify parts of a wood jamb and frame.
3. Discuss and demonstrate how to size and install door jambs and door-stop strips.

SESSION THREE
Session Three introduces metal door jambs and frames.
1. Show Session Three PowerPoint® presentation slides.
2. Discuss and demonstrate the installation of metal door frames over various base materials.

SESSION FOUR
Session Four introduces door hardware.
1. Show Session Four PowerPoint® presentation slides.
2. Review terminology related to door hardware.
3. Identify the most common hinges and locksets used in residential and commercial construction.
4. Identify various types of accessories and common types of security hardware for commercial doors.

SESSION FIVE
Session Five introduces installing residential doors.
1. Show Session Five PowerPoint® presentation slides.
2. Discuss the use of door jacks.
3. Discuss and demonstrate the installation of prehung doors.

SESSION SIX
Session Six introduces installing commercial doors.
1. Show Session Six PowerPoint® presentation slides.
2. Discuss and demonstrate how doors are fit into openings.
3. Discuss and demonstrate how to install door hinges.
Session Seven introduces installing commercial doors.

1. Show Session Seven PowerPoint® presentation slides.
2. Discuss and demonstrate the use of butt-hinge templates.
3. Discuss and demonstrate the installation of locksets and door closers.
4. Discuss the use of door schedules in commercial construction drawings.

Session Eight is a review and testing session. Have trainees complete the module Review Questions and Trade Terms Quiz. (Alternatively, these may be assigned as homework at the end of Session Seven.) Answer any questions that trainees may have.

1. Have trainees complete the Module Examination. Any outstanding performance testing must be completed during this session.
2. Record the testing results on Training Report Form 200, and submit the report to your Training Program Sponsor.
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<thead>
<tr>
<th>Equipment and Materials</th>
<th>Materials/Equipment</th>
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<tr>
<td><strong>Personal protective equipment:</strong></td>
<td>Assortment of finish nails, Door cutaways</td>
</tr>
<tr>
<td>Hard hat</td>
<td>Assortment of screws, Door-stop strips</td>
</tr>
<tr>
<td>Eye protection</td>
<td>Carpet samples, Drill</td>
</tr>
<tr>
<td>Gloves</td>
<td>Chisel, Drill bits</td>
</tr>
<tr>
<td>Whiteboard/chalkboard</td>
<td>Masking tape, Finish nails</td>
</tr>
<tr>
<td>Markers/chalk</td>
<td>Prehung doors, Hinges</td>
</tr>
<tr>
<td>Pencils and paper</td>
<td>Nails, Locksets</td>
</tr>
<tr>
<td><strong>Carpentry Level Two</strong></td>
<td>Assortment of external door stops, door holders, and door closers</td>
</tr>
<tr>
<td>PowerPoint® Presentation Slides</td>
<td>Photographs of rough-framed buildings</td>
</tr>
<tr>
<td>TV/DVD player</td>
<td>Assortment of residential door hinges</td>
</tr>
<tr>
<td>Computer</td>
<td>Residential doors, Router and bits</td>
</tr>
<tr>
<td>Copies of the Module Examination and Performance Profile Sheets</td>
<td>Assortment of commercial locksets, Set of commercial construction drawings with a door schedule</td>
</tr>
<tr>
<td>Vendor-supplied videos/DVDs showing doors and door hardware (optional)</td>
<td>Assortment of security hardware, Assortment of commercial door hinges</td>
</tr>
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<td></td>
<td>Assortment of touch-bar or crossbar hardware, Scrap lumber (2 × 4s, 2 × 6s, etc.)</td>
</tr>
<tr>
<td></td>
<td>Assortment of weather stripping and thresholds, Assortment of residential locksets</td>
</tr>
<tr>
<td></td>
<td>Butt-hinge template, Samples of metal door jambs</td>
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<tr>
<td></td>
<td>Circular saw, Samples of wood door jambs</td>
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<tr>
<td></td>
<td>Commercial doors, Unassembled metal door frames</td>
</tr>
<tr>
<td></td>
<td>Door closers, Welded metal door frames</td>
</tr>
<tr>
<td></td>
<td>Wood door jambs</td>
</tr>
</tbody>
</table>

To the extent possible, and as required for performance testing, provide a selection of the tools listed for each session; alternatively, photos may be used to teach tool identification.
**Module Seven** (27206-13) describes the various types of gypsum drywall, their uses, and the fastening devices and methods used to install them. The module also contains detailed instructions for installing drywall on walls and ceilings using nails, drywall screws, and adhesives. A discussion of fire- and sound-rated walls is also presented.

**Objectives**

**Learning Objective 1**
- Identify components of a drywall assembly.
  a. List the types of gypsum products.
  b. Identify drywall fasteners and list their uses.
  c. Identify drywall accessories and state their applications.

**Learning Objective 2**
- Describe the installation of drywall.
  a. Describe the purpose of a finish schedule.
  b. List the tools used for drywall application.
  c. Identify methods of sound-isolation construction.
  d. Describe the procedure for drywall construction.
  e. List special applications for drywall.

**Learning Objective 3**
- Contrast rated assemblies to nonrated assemblies.
  a. Describe single-ply drywall application.
  b. Describe how fire-rated walls are constructed.
  c. List multi-ply drywall applications.
  d. Describe how to prioritize walls.

**Learning Objective 4**
- Identify how to calculate a quantity takeoff for proper drywall installation.
  a. Explain how to perform a material takeoff for drywall.
  b. Explain how to perform a material takeoff for drywall fasteners.

**Performance Tasks**

**Performance Task 1** (Learning Objective 1)
- Select the type and thickness of drywall required for an installation.

**Performance Task 2** (Learning Objective 2)
- Install gypsum drywall panels on a stud wall and a ceiling using any or all of the following fastening systems:
  - Nails
  - Screws
  - Adhesives

**Performance Task 3** (Learning Objective 4)
- Estimate material quantities for an installation.

**Teaching Time: 15 hours**
(Six 2.5-hour classroom sessions)
Session time may be adjusted to accommodate your class size, schedule, and teaching style.

**Prerequisites**
*Core Curriculum* and *Carpentry Level One*

**Before You Begin**
As you prepare for each session, allow sufficient time to review the course objectives, content, visual aids (including the PowerPoint® presentation), and these lesson plans, and to gather the required equipment and materials. Consider time required for demonstrations, laboratories, field trips, and testing.

Using your access code, download the Module Examinations and Performance Profile Sheets from [www.nccerirc.com](http://www.nccerirc.com). The passing score for submission into NCCER's Registry is 70 percent or above for the Module Examination; performance testing is graded pass or fail.
Safety Considerations
This module requires that trainees work with sharp cutting tools. In addition, sharp metal edges of furring channels and steel framing members may be encountered. Safety is paramount in the carpentry trade and safe habits and practices must be emphasized whenever possible. Performance Tasks must be completed under your supervision. Each trainee must use required PPE and follow safe tool practices and procedures.

Classroom Equipment and Materials
Whiteboard/chalkboard
Markers/chalk
Pencils and paper
*Carpentry Level Two PowerPoint® Presentation Slides
Computer
Copies of the Module Examination and Performance Profile Sheets
Vendor-supplied videos/DVDs showing drywall installation (optional)
TV/DVD player

Equipment and Materials for Laboratories and Performance Testing
Personal protective equipment (PPE):
- Hard hat
- Eye protection
- Gloves
- Hearing protection
- Respiratory protection

- 4’ T-square
- Adhesive applicator
- Assortment of drywall adhesives
- Assortment of drywall nails
- Assortment of drywall screws
- Assortment of fire-stopping materials
- Assortment of furring channels
- Assortment of gypsum product samples
- Calculator
- Carbide cutter
- Circle cutter
- Drywall adhesive
- Drywall hammer

- Drywall lifter
- Drywall nails
- Drywall panels
- Drywall saw
- Drywall screws
- Hammer
- Hook-bill knife
- *International Building Code®
- *International Residential Code®
- Jab saw
- Light box cutter
- Local building code
- Rasp
- Screwgun
- Set of commercial construction drawings containing a fastening schedule
- Set of residential construction drawings
- T-brace
- Utility knife

Additional Resources and References
This module presents thorough resources for task training. The following resource material is suggested for further study:


There are a number of online resources available for trainees who would like more information on drywall installation. A search for additional information may be assigned as homework to interested trainees.

Instructors should view any videos that may be identified in the lesson plan before using them to ensure their suitability. The videos can provide teachable moments in both proper and improper work processes and behaviors. Be prepared to stop the videos at appropriate times to point out and discuss both proper and improper conduct and techniques.

Instructors are encouraged to locate additional audiovisual aids available on the Internet, make personal videos, and take photos related to the subject matter and add them to the PowerPoint® presentations throughout the program.
The lesson plan for this module is divided into six 2.5-hour sessions. Each session includes 10 minutes for administrative tasks and one 10-minute break.

**Session One**
Session One introduces gypsum products and their manufacture.
1. Show Session One PowerPoint® presentation slides.
2. Discuss the various types of gypsum products and their applications.
3. Discuss methods to attach drywall panels to the base materials.

**Session Two**
Session Two introduces hand and power tools used for drywall installation and the use of furring channels.
1. Show Session Two PowerPoint® presentation slides.
2. Discuss and demonstrate the use of hand and power tools on drywall.
3. Discuss the application and installation of furring channels.

**Session Three**
Session Three introduces drywall installation.
1. Show Session Three PowerPoint® presentation slides.
2. Discuss how to properly prepare a job site for drywall installation.
3. Discuss and demonstrate how to properly install drywall.

**Session Four**
1. Session Four introduces rated and nonrated assemblies.
2. Show Session Four PowerPoint® presentation slides.
3. Discuss the use of single- and multi-ply applications.
4. Discuss the use of fire-stops in wall construction.

**Session Five**
Session Five introduces the trainees to estimating drywall quantities.
1. Show Session Five PowerPoint® presentation slides.
2. Discuss and demonstrate how to estimate quantities of drywall.
3. Discuss and demonstrate how to estimate quantities of drywall fasteners.

**Session Six**
Session Six is a review and testing session. Have trainees complete the module Review Questions and Trade Terms Quiz. (Alternatively, these may be assigned as homework at the end of Session Five.) Answer any questions that trainees may have.
1. Have trainees complete the Module Examination. Any outstanding performance testing must be completed during this session.
2. Record the testing results on Training Report Form 200, and submit the report to your Training Program Sponsor.
## Materials Checklist for Module 27206-13, Drywall Installation

<table>
<thead>
<tr>
<th>Equipment and Materials</th>
<th>Drywall lifter</th>
<th>Drywall nails</th>
<th>Drywall panels</th>
<th>Drywall saw</th>
<th>Drywall screws</th>
<th>Drywall screws</th>
<th>Hammer</th>
<th>Hook-bill knife</th>
<th>Assortment of fire-stopping materials</th>
<th>Assortment of furring channels</th>
<th>Set of commercial construction drawings containing a fastening schedule</th>
<th>Assortment of gypsum product samples</th>
<th>Set of residential construction drawings</th>
<th>Drywall hammer</th>
<th>Rasp</th>
<th>Screwgun</th>
<th>T-brace</th>
<th>Utility knife</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal protective equipment:</td>
<td>4’ T-square</td>
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<td>Hard hat</td>
<td>Adhesive applicator</td>
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<td>Eye protection</td>
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<td>Gloves</td>
<td>Assortment of drywall nails</td>
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<td>Hearing protection</td>
<td>Assortment of drywall screws</td>
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<td>Respiratory protection</td>
<td>Calculator</td>
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<td>Whiteboard/chalkboard</td>
<td>Assortment of furring channels</td>
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<tr>
<td>Vendor-supplied videos/DVDs showing drywall installation (optional)</td>
<td>Set of commercial construction drawings containing a fastening schedule</td>
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<tr>
<td>Pencils and paper</td>
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<td>International Residential Code&lt;sup&gt;®&lt;/sup&gt;</td>
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<tr>
<td>Carpentry Level Two PowerPoint&lt;sup&gt;®&lt;/sup&gt; Presentation Slides</td>
<td>Carbide cutter</td>
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<td>Jab saw</td>
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<td>Markers/chalk</td>
<td>Circle cutter</td>
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<td>Light box cutter</td>
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<tr>
<td>Copies of the Module Examination and Performance Profile Sheets</td>
<td>Assortment of gypsum product samples</td>
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<td></td>
<td>Set of residential construction drawings</td>
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<td>Computer</td>
<td>Drywall hammer</td>
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<td>Rasp</td>
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<tr>
<td>TV/DVD player</td>
<td>Local building code</td>
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<td>Screwgun</td>
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<td>Assortment of drywall adhesives</td>
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<td>T-brace</td>
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</tbody>
</table>

To the extent possible, and as required for performance testing, provide a selection of the tools listed for each session; alternatively, photos may be used to teach tool identification.
Module Eight (27207-13) describes the materials, tools, and methods used to finish and patch gypsum drywall. A discussion of both automatic and manual taping and finishing tools is presented.

Objectives

Learning Objective 1
• Identify differences between the six levels of finish established by industry standards.

Learning Objective 2
• Identify the different materials for proper drywall finishing.
  a. Describe how to select the proper trim.
  b. Describe the purposes of tapes, compounds, coatings, and sanding materials.

Learning Objective 3
• Identify the proper tools used in drywall finishing.
  a. Identify the hand tools used in drywall finishing.
  b. Identify the automatic tools used in drywall finishing.

Learning Objective 4
• Describe proper drywall finishing procedures.
  a. Identify ideal site conditions for drywall finishing.
  b. Describe the process for finishing drywall.
  c. Describe the hand-finishing procedures involved in drywall finishing.
  d. Describe the automatic taping and finishing procedures involved in drywall finishing.
  e. Identify common joint problems when finishing drywall.
  f. Identify common compound problems when finishing drywall.
  g. Identify common fastener problems when finishing drywall.
  h. Identify common problems when finishing drywall.

Learning Objective 5
• Explain how to estimate the proper amount of drywall finishing materials.

Performance Tasks

Performance Task 1 (Learning Objective 1)
• State the differences between the six levels of finish established by industry standards and distinguish a finish level by observation.

Performance Task 2 (Learning Objective 4)
• Properly apply a corner bead, tape, and finish to a drywall panel.

Performance Task 3 (Learning Objective 4)
• Patch damaged drywall.

Teaching Time: 17.5 hours
(Seven 2.5-hour classroom sessions)
Session time may be adjusted to accommodate your class size, schedule, and teaching style.

Prerequisites
Core Curriculum and Carpentry Level One

Before You Begin
As you prepare for each session, allow sufficient time to review the course objectives, content, visual aids (including the PowerPoint® presentation), and these lesson plans, and to gather the required equipment and materials. Consider time required for demonstrations, laboratories, field trips, and testing.

Using your access code, download the Module Examinations and Performance Profile Sheets from www.nccerirc.com. The passing score for submission into NCCER’s Registry is 70 percent or above for the Module Examination; performance testing is graded pass or fail.
**Safety Considerations**

This module requires that trainees work with dry joint compound powder. Based on the manufacturer’s SDS, respiratory protection may be required. Safety is paramount in the carpentry trade and safe habits and practices must be emphasized whenever possible. Performance Tasks must be completed under your supervision. Each trainee must use required PPE and follow safe tool practices and procedures.

### Classroom Equipment and Materials
- Whiteboard/chalkboard
- Markers/chalk
- Pencils and paper
- *Carpentry Level Two PowerPoint® Presentation Slides*
- Computer
- Copies of the Module Examination and Performance Profile Sheets
- Vendor-supplied videos/DVDs showing drywall finishing (optional)
- TV/DVD player

### Equipment and Materials for Laboratories and Performance Testing
- Personal protective equipment (PPE):
  - Hard hat
  - Eye protection
  - Gloves
  - Hearing protection
  - Respiratory protection
- 4’ T-square
- Automatic loading pump
- Automatic taping tool
- Broad knife
- Calculator
- Caulking gun
- Circle cutter
- Corner applicators and finishers
- Corner tool
- Drywall hammer
- Drywall panels
- Drywall saw
- Flat finisher
- Joint compound
- Joint tape
- Joint trowel
- Mud pan or hawk
- Nail spotter
- Nails and/or screws
- Photographs of drywall finishes
- Samples of joint tape
- Samples of trim materials
- Sanding block, pole sander, or electric sander
- Sandpaper/drywall screen
- Screwdriver
- Set of commercial drawings
- Set of residential drawings
- Sponge sander
- Trim materials
- Utility knife with plenty of blades
- Vacuum sander

### Additional Resources and References

This module presents thorough resources for task training. The following resource material is suggested for further study:


There are a number of online resources available for trainees who would like more information on drywall finishing. A search for additional information may be assigned as homework to interested trainees.

Instructors should view any videos that may be identified in the lesson plan before using them to ensure their suitability. The videos can provide teachable moments in both proper and improper work processes and behaviors. Be prepared to stop the videos at appropriate times to point out and discuss both proper and improper conduct and techniques.

Instructors are encouraged to locate additional audiovisual aids available on the Internet, make personal videos, and take photos related to the subject matter and add them to the PowerPoint® presentations throughout the program.
The lesson plan for this module is divided into seven 2.5-hour sessions. Each session includes 10 minutes for administrative tasks and one 10-minute break.

**SESSION ONE**

Session One introduces drywall finishing standards, materials, and tools.

1. Show Session One PowerPoint® presentation slides.
2. Discuss the six levels of drywall finish.
3. Identify the types of trim materials and their applications.
4. Discuss the various types of tape and joint compounds and their applications.
5. Identify and demonstrate the hand tools used to cut, install, and finish drywall. Ensure trainees understand proper safety guidelines.
6. Identify and demonstrate the automatic tools used to finish drywall. Ensure trainees understand proper safety guidelines.

**SESSION TWO**

Session Two introduces trainees to site conditions and hand-finishing procedures.

1. Show Session Two PowerPoint® presentation slides.
2. Discuss how to properly ready a site for drywall installation.
3. Provide an overview of the taping and finishing process.
4. Discuss and demonstrate the proper procedure for finishing drywall using hand tools.
5. Discuss and demonstrate the proper procedure for sanding drywall using hand tools.

**SESSION THREE**

Session Three introduces automatic taping and finishing procedures.

1. Show Session Three PowerPoint® presentation slides.
2. Discuss and demonstrate the proper procedure for loading a pump for automatic taping and finishing tools.
3. Discuss and demonstrate how to use an automatic taping tool.
4. Discuss and demonstrate how to use an automatic finishing tool.
5. Discuss and demonstrate how to use a nail spotter.
6. Discuss and demonstrate how to use a corner tool.
7. Discuss and demonstrate how to use a flat finisher.

**SESSION FOUR**

Session Four introduces finished joint and compound problems.

1. Show Session Four PowerPoint® presentation slides.
2. Discuss problems that may be encountered with finished joints.
3. Discuss problems that may be encountered with finished compound.
**SESSION FIVE**

Session Five introduces fastener and wallboard problems.
1. Show Session Five PowerPoint® presentation slides.
2. Identify and discuss common fastener problems encountered with drywall.
3. Demonstrate how to fix nail pops.
4. Discuss other drywall problems and demonstrate how they are repaired.

**SESSION SIX**

Session Six introduces trainees to estimating drywall finishing.
1. Show Session Six PowerPoint® presentation slides.
2. Discuss the rules of thumb for estimating joint tape and joint compound.
3. Demonstrate how to properly estimate drywall finishing materials.

**SESSION SEVEN**

Session Seven is a review and testing session. Have trainees complete the module Review Questions and Trade Terms Quiz. (Alternatively, these may be assigned as homework at the end of Session Six.) Answer any questions that trainees may have.
1. Have trainees complete the Module Examination. Any outstanding performance testing must be completed during this session.
2. Record the testing results on Training Report Form 200, and submit the report to your Training Program Sponsor.
# Materials Checklist for Module 27207-13, Drywall Finishing

<table>
<thead>
<tr>
<th>Equipment and Materials</th>
<th>4’ T-square</th>
<th>Joint compound</th>
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</thead>
<tbody>
<tr>
<td><strong>Personal protective equipment:</strong></td>
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<tr>
<td>Hard hat</td>
<td>Automatic loading pump</td>
<td>Joint tape</td>
</tr>
<tr>
<td>Eye protection</td>
<td>Automatic taping tool</td>
<td>Joint trowel</td>
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<tr>
<td>Gloves</td>
<td>Broad knife</td>
<td>Mud pan or hawk</td>
</tr>
<tr>
<td>Hearing protection</td>
<td>Calculator</td>
<td>Nail spotter</td>
</tr>
<tr>
<td>Respiratory protection</td>
<td>Caulking gun</td>
<td>Nails and/or screws</td>
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<tr>
<td>Whiteboard/chalkboard</td>
<td>Circle cutter</td>
<td>Drywall hammer</td>
</tr>
<tr>
<td>Markers/chalk</td>
<td>Corner applicators and finishers</td>
<td>Samples of joint tape</td>
</tr>
<tr>
<td>Pencils and paper</td>
<td>Corner tool</td>
<td>Samples of trim materials</td>
</tr>
<tr>
<td><strong>Carpentry Level Two PowerPoint® Presentation Slides</strong></td>
<td>Utility knife with plenty of blades</td>
<td>Sanding block, pole sander, or electric sander</td>
</tr>
<tr>
<td>Computer</td>
<td>Drywall panels</td>
<td>Sandpaper/drywall screen</td>
</tr>
<tr>
<td>Copies of the Module Examination and Performance Profile Sheets</td>
<td>Drywall saw</td>
<td>Screwdriver</td>
</tr>
<tr>
<td>Vendor-supplied videos/DVDs showing drywall finishing (optional)</td>
<td>Photographs of drywall finishes</td>
<td>Set of commercial drawings</td>
</tr>
<tr>
<td>TV/DVD player</td>
<td>Flat finisher</td>
<td>Set of residential drawings</td>
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<td></td>
<td>Sponge sander</td>
<td>Vacuum sander</td>
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<td></td>
<td>Trim materials</td>
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</tr>
</tbody>
</table>

To the extent possible, and as required for performance testing, provide a selection of the tools listed for each session; alternatively, photos may be used to teach tool identification.
Module Nine (27209-13) describes the materials, layout, and installation procedures for many types of suspended ceilings used in commercial construction, as well as ceiling tiles, drywall suspension systems, and pan-type ceilings.

### Objectives

**Learning Objective 1**
- Identify the components necessary to properly install a suspended ceiling system.
  - a. Identify the system components necessary to properly frame a suspended ceiling system.
  - b. Identify the suspension systems and hardware necessary to properly install a suspended ceiling system.
  - c. Identify the safe material handling and storage procedures required when installing a suspended ceiling system.

**Learning Objective 2**
- Interpret a reflected ceiling plan.
  - a. Interpret the layout information.
  - b. Interpret the MEP locations.

**Learning Objective 3**
- Identify the procedures to lay out and install a suspended ceiling system.
  - a. Identify the layout and takeoff procedures to procure materials to lay out and install a suspended ceiling system.
  - b. Identify the tools and equipment to lay out and install a suspended ceiling system.
  - c. Identify the installation methods and procedures for a suspended ceiling system.

### Performance Tasks

**Performance Task 1** (Learning Objective 2)
- Estimate the quantities of materials needed to install a lay-in suspended ceiling system in a typical room from an instructor-supplied drawing.

**Performance Task 2** (Learning Objective 3)
- Establish a level line at ceiling level such as is required when installing the wall angle for a suspended ceiling.

**Performance Task 3** (Learning Objective 3)
- Lay out and install a lay-in suspended ceiling system according to an instructor-supplied drawing.

### Teaching Time: 15 hours

(Six 2.5-hour classroom sessions)

Session time may be adjusted to accommodate your class size, schedule, and teaching style.

### Prerequisites

*Core Curriculum* and *Carpentry Level One*

### Before You Begin

As you prepare for each session, allow sufficient time to review the course objectives, content, visual aids (including the PowerPoint® presentation), and these lesson plans, and to gather the required equipment and materials. Consider time required for demonstrations, laboratories, field trips, and testing.

Using your access code, download the Module Examinations and Performance Profile Sheets from [www.nccerirc.com](http://www.nccerirc.com). The passing score for submission into NCCER’s Registry is 70 percent or above for the Module Examination; performance testing is graded pass or fail.
Safety Considerations

This module requires that trainees work at elevated locations and with metal trim members, which may have sharp edges. Safety is paramount in the carpentry trade and safe habits and practices must be emphasized whenever possible. Performance Tasks must be completed under your supervision. Each trainee must use required PPE and follow safe tool practices and procedures.

Classroom Equipment and Materials

- Whiteboard/chalkboard
- Markers/chalk
- Pencils and paper
- **Carpentry Level Two PowerPoint® Presentation Slides**
- Computer
- Copies of the Module Examination and Performance Profile Sheets
- Vendor-supplied videos/DVDs showing suspended ceilings (optional)
- TV/DVD player

Equipment and Materials for Laboratories and Performance Testing

- Personal protective equipment (PPE):
  - Hard hat
  - Eye protection
  - Gloves
  - Respiratory protection
- 50' or 100' tape
- 6' folding rule
- Acoustical panels
- Assortment of nails and screws
- Aviation snips (tin snips)
- Awl
- Baker’s scaffold
- Board
- Calculator
- Ceiling tiles
- Chalk box and chalkline
- Clamping pliers or vise grips with plastic or rubber corners
- Cross runners
- Direct-hung concealed grid system components
- Dry line
- Suspended drywall ceiling components
- Eye pins
- Furring channels
- Graph paper and pencil
- Hammer
- Hanger inserts and clips
- Hanger wire
- Hangers
- Hold-down clips
- Keyhole saw
- Ladders
- Laser level
- Lath nippers
- Level
- Magnetic punch
- Main runners
- Metal pan system components
- Photographs of poorly installed suspended ceilings
- Plumb bob
- Pop rivets
- Pop-rivet gun
- Powder-actuated tool
- Reflective ceiling plan
- Samples of suspended ceiling system tiles and panels
- Scaffold
- Scribe or compass
- Set of commercial construction drawings
- Shop drawings for a nonstandard luminous system
- Special dies for cutting suspension members
- Standard luminaire system components
- Straightedge for cutting
- Tile knife
- Wall angles
- Water level
- Whitney punch

Additional Resources and References

This module presents thorough resources for task training. The following resource material is suggested for further study:


There are a number of online resources available for trainees who would like more information on suspended ceilings. A search for additional information may be assigned as homework to interested trainees.

Instructors should view any videos that may be identified in the lesson plan before using them to ensure their suitability. The videos can provide teachable moments in both proper and improper work processes and behaviors. Be prepared to stop the videos at appropriate times to point out and discuss both proper and improper conduct and techniques.

Instructors are encouraged to locate additional audiovisual aids available on the Internet, make personal videos, and take photos related to the subject matter and add them to the PowerPoint® presentations throughout the program.
The lesson plan for this module is divided into six 2.5-hour sessions. Each session includes 10 minutes for administrative tasks and one 10-minute break.

**SESSION ONE**

Session One introduces suspended ceiling system components.
1. Show Session One PowerPoint® presentation slides.
2. Identify and discuss the various types of suspended ceiling systems.
3. Discuss the safety hazards associated with suspended ceiling installation.

**SESSION TWO**

Session Two introduces reflected ceiling plans, and laying out and estimating suspended ceiling systems.
1. Show Session Two PowerPoint® presentation slides.
2. Discuss the use of reflected ceiling plans when installing suspended ceilings.
3. Discuss and demonstrate how to sketch a ceiling plan.
4. Discuss and demonstrate how to establish room center lines.

**SESSION THREE**

Session Three introduces suspended ceiling system tools, equipment, and installation.
1. Show Session Three PowerPoint® presentation slides.
2. Identify tools that may be unfamiliar to trainees and focus instruction on these tools.
3. Discuss and demonstrate the use of water levels and laser levels when leveling the ceiling grids.
4. Discuss and demonstrate the proper procedure for installing an exposed grid system.

**SESSION FOUR**

Session Four introduces the installation of other suspended ceiling systems.
1. Show Session Four PowerPoint® presentation slides.
2. Discuss and demonstrate the installation of the following suspended ceiling systems:
   - Metal pan systems
   - Direct-hung concealed grid system
   - Standard and nonstandard luminous systems

**SESSION FIVE**

Session Five introduces the installation of suspended drywall ceilings, acoustical panels, and furring channels.
1. Show Session Five PowerPoint® presentation slides.
2. Discuss and demonstrate the installation of suspended drywall ceilings, acoustical panels, and furring channels.
3. Discuss the proper methods to clean ceiling tile.

**SESSION SIX**

Session Six is a review and testing session. Have trainees complete the module Review Questions and Trade Terms Quiz. (Alternatively, these may be assigned as homework at the end of Session Five.) Answer any questions that trainees may have.
1. Have trainees complete the Module Examination. Any outstanding performance testing must be completed during this session.
2. Record the testing results on Training Report Form 200, and submit the report to your Training Program Sponsor.
### Materials Checklist for Module 27209-13, Suspended Ceilings

<table>
<thead>
<tr>
<th>Equipment and Materials</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Personal protective equipment:</strong></td>
<td></td>
</tr>
<tr>
<td>50' or 100' tape</td>
<td>Keyhole saw</td>
</tr>
<tr>
<td>Hard hat</td>
<td>6' folding rule</td>
</tr>
<tr>
<td>Eye protection</td>
<td>Acoustical panels</td>
</tr>
<tr>
<td>Gloves</td>
<td>Assortment of nails and screws</td>
</tr>
<tr>
<td>Respiratory protection</td>
<td>Aviation snips (tin snips)</td>
</tr>
<tr>
<td>Whiteboard/chalkboard</td>
<td>Awl</td>
</tr>
<tr>
<td>Markers/chalk</td>
<td>Baker's scaffold</td>
</tr>
<tr>
<td>Pencils and paper</td>
<td>Board</td>
</tr>
<tr>
<td><strong>Carpentry Level Two PowerPoint® Presentation Slides:</strong></td>
<td></td>
</tr>
<tr>
<td>Samples of suspended ceiling system tiles and panels</td>
<td>Photographs of poorly installed suspended ceilings</td>
</tr>
<tr>
<td>Computer</td>
<td>Ceiling tiles</td>
</tr>
<tr>
<td>Copies of the Module Examination and Performance Profile Sheets</td>
<td>Chalk box and chalkline</td>
</tr>
<tr>
<td>Vendor-supplied videos/DVDs showing suspended ceilings (optional)</td>
<td>Clamping pliers or vise grips with plastic or rubber corners</td>
</tr>
<tr>
<td>TV/DVD player</td>
<td>Special dies for cutting suspension members</td>
</tr>
<tr>
<td>Dry line</td>
<td>Set of commercial construction drawings</td>
</tr>
<tr>
<td>Pencils and paper</td>
<td>Pop-rivet gun</td>
</tr>
<tr>
<td><strong>Suspended drywall ceiling components:</strong></td>
<td></td>
</tr>
<tr>
<td>Eye pins</td>
<td>Scribe or compass</td>
</tr>
<tr>
<td>Furring channels</td>
<td>Reflective ceiling plan</td>
</tr>
<tr>
<td>Graph paper and pencil</td>
<td>Straightedge for cutting</td>
</tr>
<tr>
<td>Hammer</td>
<td>Powder-actuated tool</td>
</tr>
<tr>
<td><strong>Direct-hung concealed grid system components:</strong></td>
<td></td>
</tr>
<tr>
<td>Hanger wire</td>
<td>Hanger inserts and clips</td>
</tr>
<tr>
<td>Hangers</td>
<td>Tile knife</td>
</tr>
<tr>
<td>Hold-down clips</td>
<td>Wall angles</td>
</tr>
<tr>
<td>Cross runners</td>
<td>Water level</td>
</tr>
</tbody>
</table>

To the extent possible, and as required for performance testing, provide a selection of the tools listed for each session; alternatively, photos may be used to teach tool identification.
Module Ten (27210-13) describes the different types of trim used in finish work and focuses on the proper methods for selecting, cutting, and fastening trim to provide a professional finished appearance.

**Objectives**

**Learning Objective 1**
- Describe the safety hazards related to working with window, door, floor, and ceiling trim.
  a. Identify the proper personal protection equipment required when working with window, door, floor, and ceiling trim.
  b. Identify tool and equipment safety guidelines when working with window, door, floor, and ceiling trim tools.

**Learning Objective 2**
- Identify the different types of standard moldings and materials.
  a. Identify the different types of base moldings.
  b. Identify the different types of wall moldings.
  c. Identify the different types of ceiling moldings.
  d. Identify the different types of window and door trim.

**Learning Objective 3**
- Explain how to install different types of molding.
  a. Explain how to properly cut trim.
  b. Explain how to properly fasten trim.
  c. Explain how to properly install base molding.
  d. Explain how to properly install ceiling molding.
  e. Explain how to properly install door trim.
  f. Explain how to properly install window trim.

**Learning Objective 4**
- Explain how to estimate window, door, floor, and ceiling trim.

**Performance Tasks**

**Performance Task 1** (Learning Objective 3)
- Make square and miter cuts to selected moldings using a hand miter box.

**Performance Task 2** (Learning Objective 3)
- Make square and miter cuts to selected moldings using a power miter/compound miter saw.

**Performance Task 3** (Learning Objective 3)
- Make a coped joint using a coping saw.

**Performance Task 4** (Learning Objective 3)
- Install interior trim using a finish nailer and hand nailing methods.
  - Door trim
  - Window trim
  - Base trim
  - Ceiling trim

**Performance Task 5** (Learning Objective 4)
- Estimate the quantities of different trim materials required for selected rooms.

**Teaching Time: 25 hours**
(Ten 2.5-hour classroom sessions)
Session time may be adjusted to accommodate your class size, schedule, and teaching style.

**Prerequisites**

*Core Curriculum* and *Carpentry Level One*

**Before You Begin**
As you prepare for each session, allow sufficient time to review the course objectives, content, visual aids (including the PowerPoint® presentation), and these lesson plans, and to gather the required equipment and materials. Consider time required for demonstrations, laboratories, field trips, and testing.

Using your access code, download the Module Examinations and Performance Profile Sheets from [www.nccerirc.com](http://www.nccerirc.com). The passing score for submission into NCCER’s Registry is 70 percent or above for the Module Examination; performance testing is graded pass or fail.
Safety Considerations
This module requires that trainees use power miter boxes and power nailers. Safety is paramount in the carpentry trade and safe habits and practices must be emphasized whenever possible. Performance Tasks must be completed under your supervision. Each trainee must use required PPE and follow safe tool practices and procedures.

Classroom Equipment and Materials
- Whiteboard/chalkboard
- Markers/chalk
- Pencils and paper
- PowerPoint® Presentation Slides
- Computer
- Copies of the Module Examination and Performance Profile Sheets
- Vendor-supplied videos/DVDs showing window, door, floor, and ceiling trim (optional)
- TV/DVD player

Equipment and Materials for Laboratories and Performance Testing
- Personal protective equipment (PPE):
  - Hard hat
  - Eye protection
  - Gloves
  - Hearing protection
- Baseboard
- Bed molding
- Calculator
- Catalogs from molding manufacturers
- Compound miter saw
- Compressor and hose
- Coping saw
- Cove molding
- Crosscut saw
- Crown molding
- Door trim
- Dust mask
- Finish nails (for nailer)
- Finish nails (std.)
- Floor plan
- Half-mask respirator
- Hammer
- Hand miter box
- Jamb extensions
- Miter box
- Miter saw
- Photographs of various job sites with safety infractions
- Pieces of trim
- Pneumatic finish nailer and operator’s manual
- Power miter box
- Quarter round
- Ripsaw
- Router and bits
- Sample floor plan
- Samples of coped joints
- Samples of various types of moldings
- Samples of wood and nonwood finish materials
- Section of uneven floor
- Set of residential construction drawings
- Stock molding shapes
- Stools
- Trim specifications
- Window trim

Additional Resources and References
This module presents thorough resources for task training. The following resource material is suggested for further study:


There are a number of online resources available for trainees who would like more information on window, door, floor, and ceiling trim. A search for additional information may be assigned as homework to interested trainees.

Instructors should view any videos that may be identified in the lesson plan before using them to ensure their suitability. The videos can provide teachable moments in both proper and improper work processes and behaviors. Be prepared to stop the videos at appropriate times to point out and discuss both proper and improper conduct and techniques.

Instructors are encouraged to locate additional audiovisual aids available on the Internet, make personal videos, and take photos related to the subject matter and add them to the PowerPoint® presentations throughout the program.
Session Outline for 27210-13

**WINDOW, DOOR, FLOOR, AND CEILING TRIM**

The lesson plan for this module is divided into ten 2.5-hour sessions. Each session includes 10 minutes for administrative tasks and one 10-minute break.

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**SESSION ONE**

Session One introduces safety when installing trim.
1. Show Session One PowerPoint® presentation slides.
2. Discuss safety hazards and proper personal protective equipment (PPE) to be worn when installing trim.
3. Review the use and safety guidelines related to power miter saws, routers, and pneumatic finish nailers.

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**SESSION TWO**

Session Two introduces types of molding and trim materials.
1. Show Session Two PowerPoint® presentation slides.
2. Identify types of moldings used for interior trim and their applications.

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**SESSION THREE**

Session Three introduces how to cut trim.
1. Show Session Three PowerPoint® presentation slides.
2. Discuss the importance of making accurate finish cuts.
3. Discuss and demonstrate the safe use of power miter saws and compound miter saws.
4. Discuss and demonstrate how to cut flat miters and crown, bed, and cove moldings using a hand miter box and power miter saws.
5. Discuss and demonstrate how to cut a coped joint.

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**SESSION FOUR**

Session Four introduces how to fasten trim.
1. Show Session Four PowerPoint® presentation slides.
2. Review and demonstrate the safe use of a pneumatic finish nailer.

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**SESSION FIVE**

Session Five introduces how to install base molding using the hand-nailing method.
1. Show Session Five PowerPoint® presentation slides.
2. Discuss the proper sequence in which to install base molding.
3. Discuss and demonstrate how to install base molding using the hand-nailing method.

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**SESSION SIX**

Session Six introduces how to install base molding using a pneumatic finish nailer.
1. Show Session Six PowerPoint® presentation slides.
2. Discuss and demonstrate how to install base molding using a pneumatic finish nailer.

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**SESSION SEVEN**

Session Seven introduces installing ceiling molding and door trim.
1. Show Session Seven PowerPoint® presentation slides.
2. Discuss and demonstrate how to install ceiling molding using the hand-nailing method and a pneumatic finish nailer.
3. Discuss and demonstrate how to install door trim using the hand-nailing method and a pneumatic finish nailer.
**Session Eight**

Session Eight introduces installing window trim.

1. Show Session Eight PowerPoint® presentation slides.
2. Identify the two methods used to trim windows.
3. Discuss and demonstrate how to cut and install a stool.
4. Discuss and demonstrate how to trim out a window.

**Session Nine**

Session Nine introduces estimating trim quantities.

1. Show Session Nine PowerPoint® presentation slides.
2. Identify the two general categories of trim for estimating purposes.
3. Discuss and demonstrate how to estimate the amount of running trim.
4. Discuss and demonstrate how to estimate the amount of standing trim.

**Session Ten**

Session Ten is a review and testing session. Have trainees complete the module Review Questions and Trade Terms Quiz. (Alternatively, these may be assigned as homework at the end of Session Nine.) Answer any questions that trainees may have.

1. Have trainees complete the Module Examination. Any outstanding performance testing must be completed during this session.
2. Record the testing results on Training Report Form 200, and submit the report to your Training Program Sponsor.
### Equipment and Materials

| Equipment and Materials:                              | Baseboard | Jamb extensions | Hard hat | Bed molding | Miter box | Eye protection | Calculator | Miter saw | Gloves | Samples of cope joints | Ripsaw | Hearing protection | Compound miter saw | Pieces of trim | Whiteboard/chalkboard | Compressor and hose | Dust mask | Markers/chalk | Coping saw | Power miter box | Powerpoint® Presentation | Slides | Computer | Crown molding | Router and bits | Copies of the Module Examination and Performance Profile Sheets | Door trim | Sample floor plan | Vendor-supplied videos/DVDs showing window, door, floor, and ceiling trim (optional) | Photographs of various job sites with safety infractions | Samples of wood and nonwood finish materials | TV/DVD player | Catalogs from molding manufacturers | Samples of various types of moldings | Finish nails (std.) | Finish nails (for nailer) | Floor plan | Section of uneven floor | Half-mask respirator | Stock molding shapes | Hammer | Stools | Hand miter box | Trim specifications | Crosscut saw | Window trim |

To the extent possible, and as required for performance testing, provide a selection of the tools listed for each session; alternatively, photos may be used to teach tool identification.
Module Eleven (27211-13) provides detailed instructions for the selection and installation of base and wall cabinets and countertops.

### Objectives

<table>
<thead>
<tr>
<th>Learning Objective 1</th>
<th>Learning Objective 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Describe the safety hazards when installing cabinets.</td>
<td>• Explain how to lay out and install a basic set of cabinets.</td>
</tr>
<tr>
<td>a. Identify tool and material hazards that may be present when installing cabinets.</td>
<td>a. Describe the surface preparation needed before cabinet installation.</td>
</tr>
<tr>
<td>b. Explain how to prevent back injuries through proper ergonomics.</td>
<td>b. Explain how to install wall cabinets.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Learning Objective 2</th>
<th>Learning Objective 3</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Identify the different types of cabinets.</td>
<td>• Identify cabinet components and hardware and describe their purpose.</td>
</tr>
<tr>
<td>a. Identify wall cabinets.</td>
<td>a. Identify cabinet components.</td>
</tr>
<tr>
<td>b. Identify base cabinets.</td>
<td>b. Describe various types of hardware used on cabinets.</td>
</tr>
<tr>
<td>c. Describe the purpose of a countertop.</td>
<td></td>
</tr>
</tbody>
</table>

### Teaching Time: 10 hours

(Four 2.5-hour classroom sessions)

Session time may be adjusted to accommodate your class size, schedule, and teaching style.

### Prerequisites

*Core Curriculum and Carpentry Level One*

### Before You Begin

As you prepare for each session, allow sufficient time to review the course objectives, content, visual aids (including the PowerPoint® presentation), and these lesson plans, and to gather the required equipment and materials. Consider time required for demonstrations, laboratories, field trips, and testing.

Using your access code, download the Module Examinations and Performance Profile Sheets from [www.nccerirc.com](http://www.nccerirc.com). The passing score for submission into NCCER’s Registry is 70 percent or above for the Module Examination; performance testing is graded pass or fail.
**Safety Considerations**

This module requires that trainees lift cabinets, which may be heavy. Safety is paramount in the carpentry trade and safe habits and practices must be emphasized whenever possible. Performance Tasks must be completed under your supervision. Each trainee must use required PPE and follow safe tool practices and procedures.

**Classroom Equipment and Materials**
- Whiteboard/chalkboard
- Markers/chalk
- Pencils and paper

*Carpentry Level Two PowerPoint® Presentation Slides
- Computer
- Copies of the Module Examination and Performance Profile Sheets
- Vendor-supplied videos/DVDs showing cabinet installation (optional)
- TV/DVD player

**Equipment and Materials for Laboratories and Performance Testing**
- Personal protective equipment (PPE):
  - Hard hat
  - Eye protection
- 4’ level
- Bar clamps
- Belt sander
- Broom and dustpan
- Cabinet manufacturers’ catalogs
- Chalk box and chalkline
- Chisel
- Compass or dividers
- Countertop
- Drill and drill bits
- Framing square
- Laser level
- Photographs of base cabinets
- Photographs of countertops
- Photographs of wall cabinets
- Plumb bob
- Power planer
- Power screwdriver
- Samples of cabinet doors
- Samples of cabinet drawers
- Samples of drawer guides
- Samples of hinges, catches, knobs, and pulls
- Screws
- Set of construction drawings
- Shims
- Spring-loaded clamps
- Story pole
- Straightedge
- Tape measure
- T-braces
- Utility knife
- Wall cabinets
- Water level

**Additional Resources and References**

This module presents thorough resources for task training. The following resource material is suggested for further study:

- Cabinet Makers Association website. [www.cabinetmakers.org](http://www.cabinetmakers.org)
- Kitchen Cabinet Makers Association website. [www.kcma.org](http://www.kcma.org)
- Mill’s Pride Cabinetry website. [www.millspridekitchens.com](http://www.millspridekitchens.com)

There are a number of online resources available for trainees who would like more information on cabinet installation. A search for additional information may be assigned as homework to interested trainees.

Instructors should view any videos that may be identified in the lesson plan before using them to ensure their suitability. The videos can provide teachable moments in both proper and improper work processes and behaviors. Be prepared to stop the videos at appropriate times to point out and discuss both proper and improper conduct and techniques.

Instructors are encouraged to locate additional audiovisual aids available on the Internet, make personal videos, and take photos related to the subject matter and add them to the PowerPoint® presentations throughout the program.
Session Outline for 27211-13

CABINET INSTALLATION

The lesson plan for this module is divided into four 2.5-hour sessions. Each session includes 10 minutes for administrative tasks and one 10-minute break.

**SESSION ONE**

Session One introduces the types of cabinets and installation safety.

1. Show Session One PowerPoint® presentation slides.
2. Review general tool and equipment safety.
3. Discuss the types of base and wall cabinets that are available and applications for each.
4. Discuss countertops and the types of materials used in their manufacture.

**SESSION TWO**

Session Two introduces cabinet components and hardware.

1. Show Session Two PowerPoint® presentation slides.
2. Discuss two types of cabinet construction.
3. Discuss cabinet components, including doors, drawers, and hardware.

**SESSION THREE**

Session Three introduces cabinet installation.

1. Show Session Three PowerPoint® presentation slides.
2. Discuss surface preparation that is needed prior to cabinet installation.
3. Discuss and demonstrate the procedure for laying out and installing wall cabinets.
4. Discuss and demonstrate the procedure for laying out and installing base cabinets.
5. Demonstrate the proper method for scribing adjoining pieces.

**SESSION FOUR**

Session Four is a review and testing session. Have trainees complete the module Review Questions and Trade Terms Quiz. (Alternatively, these may be assigned as homework at the end of Session Three.) Answer any questions that trainees may have.

1. Have trainees complete the Module Examination. Any outstanding performance testing must be completed during this session.
2. Record the testing results on Training Report Form 200, and submit the report to your Training Program Sponsor.
# Materials Checklist for Module 27211-13, Cabinet Installation

<table>
<thead>
<tr>
<th>Equipment and Materials</th>
<th>4' level</th>
<th>Plumb bob</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eye protection</td>
<td>Bar clamps</td>
<td>Power planer</td>
</tr>
<tr>
<td>Hard hat</td>
<td>Base cabinets</td>
<td>Power screwdriver</td>
</tr>
<tr>
<td>Whiteboard/chalkboard</td>
<td>Belt sander</td>
<td>Samples of cabinet doors</td>
</tr>
<tr>
<td>Markers/chalk</td>
<td>Broom and dustpan</td>
<td>Samples of cabinet drawers</td>
</tr>
<tr>
<td>Pencils and paper</td>
<td>Cabinet manufacturers’ catalogs</td>
<td>Samples of drawer guides</td>
</tr>
<tr>
<td><strong>Carpentry Level Two</strong></td>
<td>Chalk box and chalkline</td>
<td>Samples of hinges, catches, knobs, and pulls</td>
</tr>
<tr>
<td>PowerPoint® Presentation</td>
<td>TV/DVD player</td>
<td>Chisel</td>
</tr>
<tr>
<td><strong>Slides</strong></td>
<td>Computer</td>
<td>Compass or dividers</td>
</tr>
<tr>
<td>Copies of the Module</td>
<td>Countertop</td>
<td>Shims</td>
</tr>
<tr>
<td><strong>Examination and Performance</strong></td>
<td>Vendor-supplied videos/DVDs showing cabinet installation (optional)</td>
<td>Drill and drill bits</td>
</tr>
<tr>
<td><strong>Profile Sheets</strong></td>
<td>Framing square</td>
<td>Story pole</td>
</tr>
<tr>
<td><strong>Copies of the Module</strong></td>
<td>Laser level</td>
<td>Straightedge</td>
</tr>
<tr>
<td>Examination and Performance</td>
<td>Photographs of base cabinets</td>
<td>Tape measure</td>
</tr>
<tr>
<td><strong>Profile Sheets</strong></td>
<td>Photographs of countertops</td>
<td>T-braces</td>
</tr>
<tr>
<td>Vendor-supplied videos/DVDs showing cabinet installation (optional)</td>
<td>Photographs of wall cabinets</td>
<td>Utility knife</td>
</tr>
<tr>
<td>Wall cabinets</td>
<td>Wall cabinets</td>
<td></td>
</tr>
<tr>
<td>Water level</td>
<td>Water level</td>
<td></td>
</tr>
</tbody>
</table>

To the extent possible, and as required for performance testing, provide a selection of the tools listed for each session; alternatively, photos may be used to teach tool identification.