



Building Construction
SC Architecture and Construction State Standards

Unit Title	Unit: 7 Ceiling and Roof Framing
Unit Dates	Projected start and end dates; Weeks 24-26 March 3-13
State Standards Covered	Standard I: Details basic knowledge in residential ceiling and roof framing.
Unit Learning Target	SWBAT: By the end of this unit, students will be able to frame a basic gable roof and conduct a roof material takeoff using professional methods and tools, assessed through practical tasks and quizzes.

Unit summary

This unit introduces students to ceiling and roof framing concepts, methods, and materials. Students will engage with industry-standard techniques to frame roofs, understand truss use, and estimate material requirements. Activities include hands-on rafter layout, model building, and collaborative problem-solving, enhanced by visual aids and interactive discussions.

Skills for the teacher to teach

Roof Design and Styles

- Learning about various roof types (e.g., gable, hip, shed, gambrel).
- Adapting framing techniques to match roof styles.
- Understanding the impact of local building codes and climate on design.

Structural Integrity

- Ensuring load distribution and balance in roof structures.
- Incorporating safety measures like hurricane ties or straps.
- Recognizing and correcting structural defects.

Building Codes and Standards

- Familiarity with local and national building codes.
- Ensuring compliance with safety regulations.
- Understanding fire resistance and ventilation requirements.

Problem-Solving and Troubleshooting

- Identifying and resolving issues in framing and alignment.
- Making on-the-spot adjustments during construction.
- Repairing damaged or improperly framed structures.

Safety Practices

- Wearing appropriate personal protective equipment (PPE).
- Working safely at heights, including proper ladder and scaffold use.
- Recognizing and mitigating risks in a construction environment.

Task for students to complete

Basic Tasks

Blueprint Reading Activity

- Provide students with a set of blueprints or plans for a roof structure.
- Ask them to identify key elements (e.g., rafters, joists, pitch) and calculate dimensions.

Measuring and Marking

- Measure and mark lumber for ceiling joists or roof rafters based on given dimensions.
- Use tools like a speed square or framing square to mark angles and cuts.

Tool Safety Demonstration

- Demonstrate the safe use of specific tools, such as a circular saw or nail gun.
- Perform a checklist of safety protocols.

Intermediate Tasks

Ceiling Joist Assembly

- Cut and assemble a small section of ceiling joists.
- Ensure spacing and alignment meet building code standards.

Rafter Cutting and Fitting

- Calculate and cut a rafter to fit a given roof slope (e.g., 6/12 pitch).
- Test the fit on a mock ridge board.
- Construct group roof projects

Assessment students will complete / Product they will produce

- **Formative Assessments:** Quizzes, group presentations, and hands-on activities.
- **Summative Assessments:** Final project (ceiling and roof construction), written exam on theory and regulations, and a practical skills test. Students will combine skills learned from units 7 to complete an roof system installation project.

What resources/materials/supplies will be needed, and how will they be secured?

Tools and Equipment

Measuring and Marking Tools:

Tape measures, framing squares, speed squares, chalk lines, and protractors.

Cutting Tools:

Hand saws, circular saws, miter saws, and jigsaws.

Assembly Tools:

Hammers, nail guns, screwdrivers, and drills.

Clamping and Holding:

Bar clamps, C-clamps, sawhorses, and workbenches.

What business partner support (guest speaker, materials, resources) is available?

- BCT Advisory Committee
- Commercial Roofing

Will this unit include a certification? Is it an approved certification? Purchase plan?

- Yes, YouScience. This certification is under review by SC State standards.

How will students know they are making progress toward the overall learning target?

- [Exit tickets](#)

How will student reflect on their learning success, challenges, and take-aways?

- Student feedback/survey - Unit 7 Student Survey

Teacher reflection notes – What may need to be modified after completing the lesson?

- [Teacher reflection link](#)