

### Lesson #5: Scale Model Truss Roof Framing (20 Days)

#### Objectives

##### Students will be able to...

- Layout, and construct a conventionally stacked roof in 1" scale from blueprints.
- Correctly spell and use the terminology associated with wood wall framing.
- Assess scale model roof framing; adherence to code, cleanliness, squareness, and accuracy (compared to the prints and to scale).
- Identify the name and purpose of the members involved in the construction of a conventionally stacked roof, and how they are assembled.
- What properly constructed roof sections look like.

#### Common Core Standards

LS 11-12.6

RLST 11-12.2

Health and Safety 6.0, 6.2, 6.3, 6.4, 6.5, 6.6

Technical Knowledge and Skills 10.0, 10.1, 10.2, 10.3, 10.4

Cabinetmaking and Wood Products Pathway A4.1, A4.4, A6.1

Residential and Commercial Pathway D2.1, D2.2, D2.3, D3.1, D3.2, D3.3, D4.1, D5.2, D6.13, D6.14, D6.15, D6.16

#### Materials

Model: Roof Lumber Package

Model: Ready to Be Stacked with Pre-Cut Rafters And Frieze Blocks Prepped

Model Truss Roof Framing Project Guidelines

Model: Prototype Roof with Blind Valley Installed

Construction Self-Evaluation

Roof Framing Test

### Lesson Sequence

- Have students gather around the workbench in the shop and have a couple of *roof lumber packages* and prototype roof on display.
- Have a model ready to *be stacked with several pre-cut rafters and frieze blocks prepped*.
- Demonstrate how to layout, cut, and stack a conventionally framed roof.
- Hand out the *Model Truss Roof Framing Project Guidelines*. Review the criteria that students will be graded on.
- Allow students to work on their roof framing.
- Around Day 11- have a *prototype roof with the blind valley installed* on a display. Have a model ready to be stacked and demonstrate how to install the blind valley.
- Allow students time to build their model roofs.
- Day 19- Display projects and have students look at each other's final projects. Have students fill out the *construction self-evaluation worksheet*. Grade student's projects.
- Day 20- *Roof Framing Test*

### Assessment

Monitor student understanding throughout the project through informal observations and checking for understanding. Clarify any misunderstandings as needed. Use student's self-evaluation and grading rubric to grade final project.  
Roofing Framing test

### Accommodations/Modifications

Extra Time If Needed  
Check for Understanding  
Visuals  
Test Read Aloud If Needed  
Peer Support

**Construction Self-Evaluation**

1. Two things I learned about this portion of framing so far are...

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2. Four terms and their definitions that I have learned about this portion of framing are...

1) \_\_\_\_\_

2) \_\_\_\_\_

3) \_\_\_\_\_

4) \_\_\_\_\_

3. Safety practices that I have been observing are...

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4. Two things I would still like to learn about framing is...

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**Model Truss Roof Framing Project Guidelines**

## **BUILDING INDUSTRY TECHNOLOGY ACADEMY: YEAR ONE CURRICULUM**

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	Grade out of 10 points (10 being the highest)	Comments
Perimeter dimensions accuracy		
Wall height accuracy		
Window/door placement accuracy		
Window/door dimension accuracy		
Interior wall placement accuracy		
Framed roof appearance (square, complete, strong)		
Top chords flat and level in relations to each other		
Ridge is accurately placed (height, placing on top plate)		
All framing parts are accurately placed (king studs, top plates etc.)		
	Total Score:        /90	

### Project Self-Evaluation

1. What I have learned from this project...

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2. Safety practices that I observed on this project...

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3. What I like and don't like about the structure/appearance of my project...

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4. What I could have done differently during this project...

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5. Skills I learned from this project...

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**BUILDING INDUSTRY TECHNOLOGY ACADEMY: YEAR ONE CURRICULUM**

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6. How much time did you put into this project?

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7. If you had to make five of these projects, how you manage your time differently?

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8. The grade that I would give myself on this project is a(n) \_\_\_\_\_.

### Roof Framing Test

Directions: Fill in the missing words in each sentence using the word bank. Each term will be used once.

1. The end of the rafter that extends beyond the seat-cut is known as the \_\_\_\_\_, and makes up the eave, or overhang of the roof.

2. The angle, or slope of a roof is referred to as the \_\_\_\_\_, which is noted as the inches of vertical rise over 12 inches of horizontal run.

3. This horizontal framing member forms the peak of the roof. It is what we nail the top of the rafters to. It is the \_\_\_\_\_.

4. The Bird's Mouth, or \_\_\_\_\_ is the point where a rafter attaches to the double top plate of a wall.

5. The roof framing equivalent of the stud, the \_\_\_\_\_ is the primary load-bearing member of a conventionally stacked roof.

6. \_\_\_\_\_ and \_\_\_\_\_ are ways we create triangulation (thus greater strength) in conventionally stacked roofs.

7. We make a \_\_\_\_\_ at the top of a rafter where it is to be nailed to the ridge.

8. The two types of roof framing used in residential construction are the \_\_\_\_\_ and the \_\_\_\_\_.

9. Twisting, bending, or pulling forces are referred to as \_\_\_\_\_ forces.

Conventional stack
Ridge
Collar ties
Gang-nail plates
Truss
Compression
Seat cut
Pitch
Fink / W
Tail
Gable
Plumb cut
Chords
Tension
Hip
Rafter
Ceiling joists
Webs
Gussets
Scissors

10. Trusses are assembled using either metal \_\_\_\_\_, or plywood \_\_\_\_\_ to connect the joints.

11. The \_\_\_\_\_ truss is the most commonly used truss shape in residential construction.

12. The members of a truss that fit between the chords are referred to as the \_\_\_\_\_.

13. If you preferred vaulted (angled) ceilings in your home instead of flat ceilings, you would use a \_\_\_\_\_ truss.

14. The two most common **roof styles** in Southern California are the \_\_\_\_\_ and the \_\_\_\_\_.

15. The top and bottom members of a truss are referred to as the \_\_\_\_\_.

16. A framing member that experiences crushing forces is said to be under \_\_\_\_\_.

Conventional stack
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Ceiling joists
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Scissors

**Roof Framing Test - *Answer Key***

1. The end of the rafter that extends beyond the seat-cut is known as the **tail**, and makes up the eave, or overhang of the roof.
2. The angle, or slope of a roof is referred to as the **pitch**, which is noted as the inches of vertical rise over 12 inches of horizontal run.
3. This horizontal framing member forms the peak of the roof. It is what we nail the top of the rafters to. It is the **ridge**.
4. The Bird's Mouth, or **seat cut** is the point where a rafter attaches to the double top plate of a wall.
5. The roof framing equivalent of the stud, the **rafter** is the primary load-bearing member of a conventionally stacked roof.
6. **Ceiling joists** and **collar ties** are ways we create triangulation (thus greater strength) in conventionally stacked roofs.
7. We make a **plumb cut** at the top of a rafter where it is to be nailed to the ridge.
8. The two types of roof framing used in residential construction are the **truss** and the **conventional stack**.
9. Twisting, bending, or pulling forces are referred to as **tension** forces.
10. Trusses are assembled using either metal **gang-nail plates**, or plywood **gussets** to connect the joints.
11. The **fink / W** truss is the most commonly used truss shape in residential construction.
12. The members of a truss that fit between the chords are referred to as the **webs**.
13. If you preferred vaulted (angled) ceilings in your home instead of flat ceilings, you would use a **scissors** truss.
14. The two most common **roof styles** in Southern California are the **gable** and the **hip**.
15. The top and bottom members of a truss are referred to as the **chords**.
16. A framing member that experiences crushing forces is said to be under **compression**.