# *Residential Carpentry Framing*

- Wall Framing
- Roof Framing
- Floor Framing
- Ceiling Framing

meridian education corporation

## Instructor's Guide

## Program Objectives

After watching this series, viewers will know:

- How the frame carries the load of the house
- How to frame the floors, walls, ceiling, and roof using conventional framing materials
- Safety practices for the job site
- What framing carpenters do

## Pre-Viewing Activities

Before viewing this series, discussion of the topic may be initiated by:

- Inviting a framing carpenter, residential building contractor, or residential building architect to talk about their jobs
- Visiting a construction site to observe a house being framed

## Vocabulary Terms

### ANCHOR BOLT

An anchor bolt attaches objects to concrete. The wood plate on which the house framing bears is fastened to the foundation with anchor bolts. They are placed in the foundation not more than 4 feet apart.

### BAND RAFTER OR FASCIA

The board that is nailed to the end of the common rafters at the overhang cut.

### BEAM

A horizontal bearing member such as a joist.

### BIRD'S MOUTH

The notch cut into the roof rafter that allows it to fit snugly over the top plate.

### BOTTOM OR SOLE PLATE

The 2x4 which is the lowermost part of the wall frame. Laid horizontally on the subfloor, it carries the bottom ends of the studs.

### BRACING

The application of materials to framed construction to make it rigid and to keep comers square and plumb.

### CAP OR DOUBLE TOP PLATE

The uppermost part of the wall frame. Installed after all the walls are up and properly braced, it ties the walls and partitions together at the top and gives them extra strength.

CEILING JOISTS
In conventional roof construction, the beams that form the ceiling frame and support the ceiling load. They usually run parallel to the rafters.

COLUMN OR BEARING POST
Made of steel, timber, or concrete, it rests on footings and is the principal load-carrying vertical member of the structure.

COMMON RAFTER
An individual member of the roof frame. Common rafters usually run at a right angle from the exterior walls and rest on the ridge board.

CONVENTIONAL ROOF CONSTRUCTION
Also known as the joist and rafter method, it involves framing the roof by applying joists and rafters one piece at a time.

CRIPPLE STUD
A short stud that is sometimes added above or below the header of doors and windows. Also know as a "cripple."

FLOOR JOISTS
The beams that form the floor frame.

HEADER
The wood member that is installed where windows or doors occur in outside walls or partitions. It supports the lower ends of the studs that have been cut. For the same purpose, it is placed at the bottom of a window opening. In this case, it may be referred to as a "rough sill'' or "sill header."

HEADER JOIST
In platform construction, the band that is nailed to the ends of the floor joists, resting on the foundation wall.

LOOKOUTS
In roof framing, a series of horizontal members that are nailed to the rafters and extend from the rafter ends to the face of the sheathing.

PARTITION CHANNEL
A wall-framing component that is used to provide better anchorage where interior partitions intersect with one another or with an outside wall.

PLATFORM FRAMING
A type of conventional framing in which each floor of the structure forms a complete platform, fully independent of the walls. The subflooring extends to the outside edges of the platform-framed building, providing the surface upon which the exterior walls and interior partitions are erected.

RAKE OR FLY RAFTER
Rafters that run parallel to the slope of the roof and create the overhang between the gable wall and the exterior edge of the roof.

RIDGE OR RIDGE BOARD
The highest horizontal running member of the roof frame. It aligns the rafters and supports them at their upper ends.

ROOF SPAN OR SPAN
The distance between the outside edges of the exterior top plates.

SHEATHING
Material applied to the wall, roof, or floor (known as subflooring) frame to add strength and rigidity, provide a nailing surface, and help carry the load.

SILL OR SILL PLATE
One or two thicknesses of 2" treated lumber which are secured to the top of the foundation wall. It provides the bearing surface for the outside of the structure.

TAIL CUT OR OVERHANG CUT
The cut at the lowest edge of the rafter.

TOP, RIDGE, OR PLUMB CUT
The cut of the rafter where it meets the ridge board.

TOTAL RUN
The level distance over which any rafter passes.

TRIMMER OR TRIMMER STUD
A stud that supports the header over an opening. Because trimmers are shorter than regular studs, they are sometimes referred to as "cripples."

TRUSSED ROOF CONSTRUCTION
A style of roof framing in which prefabricated components are attached to the structure in units.

UNIT RISE
In roof framing, the degree of slope for every foot.

UNIT RUN
In roof framing, always 12 inches.

## Suggestions for a Post-Viewing Discussion and/or Exam

1. What part of the body is similar in function to the frame of a house?
2. Name three important functions of the house frame.
3. Why is it important to maintain accuracy throughout every stage of the framing process?
4. Name at least four of the basic tools and supplies used by a framing carpenter.
5. List at least five safety rules that should always be followed at the construction site.
6. What are the most common spacing intervals for joists?
7. How should all load-bearing lumber be installed?
8. What type of framing style is most commonly used throughout North America?
9. What is an important first step that the lead carpenter must take before beginning any new phase of building?
10. What symbol would be used in a wall layout to indicate where a full-length stud would be located? Cripple stud? Trimmer? Corner stud?
11. Why brace walls?
12. What is the function of the cap or double top plate?
13. How is a conventional roof constructed?
14. Name three cuts that must be laid out on a common roof rafter.
15. Define the term "unit rise."
16. When using the framing square, does one refer to the numbers on its inside, or outside edges?
17. What is a pattern rafter?
18. What does it mean to say that "the overhang rafters have been left to run wild"?
19. Explain the difference between framing an opening in a roof and an opening in a floor.
20. Name three major functions of sheathing.

## Answers to Post-Viewing Discussion and/or Exam Questions

1. What part of the body is similar in function to the frame of a house?
   *The skeleton.*

2. Name three important functions of the house frame.
   - *Encloses the structure*
   - *Distributes the load of the structure downward, ultimately to the ground*
   - *Provides the framework for the interior and exterior skins, doors, and windows*
   - *Creates spaces where the plumbing, heating/cooling and electrical systems, and the installation will be installed*

3. Why is it important to maintain accuracy throughout every stage of the framing process?
   *To ensure that the structure will be straight, square, and plumb.*

4. Name at least four of the basic tools and supplies used by a framing carpenter.
   - *Circular power saw*
   - *Level*
   - *Framing square*
   - *Carpenter's pencil*
   - *Hammer*
   - *Chalk and chalkline*
   - *Nail gun*
   - *Metal tape measure*

5. List at least five safety rules that should always be followed at the construction site.
   - *Wear safety glasses, goggles, or a face shield when sawing or using chemicals*
   - *Wear gloves when handling rough materials*
   - *Wear a hard hat whenever there is overhead construction*
   - *Wear appropriate footwear: heavy-soled work boots for the job site, rubber-soled shoes when working on the roof*
   - *Learn how to use power tools properly*
   - *If you're uncertain about something, ask for information or help*
   - *Stay alert at all times: be aware of the areas above, below, and around you*
   - *Wear sunscreen*
   - *Drink plenty of fluids*
   - *Never enter a job site after using drugs or consuming alcohol*
   - *Never leave tools resting on above-ground areas*
   - *Always keep the job site well organized and clear of debris*

6. What are the most common spacing intervals for joists?
   *16 or 24 inches on-center.*

7. How should all load-bearing lumber be installed?
   *Crown-up.*

8. What type of framing style is most commonly used throughout North America?
   *Platform framing.*

9. What is an important first step that the lead carpenter must take before beginning any new phase of building?
   *Review the plans.*

10. What symbol would be used in a wall layout to indicate where a full-length stud would be located? Cripple stud? Trimmer? Corner stud?
    - (X) Full-length stud
    - (O) Cripple stud
    - (T) Trimmer
    - (C) Corner stud

11. Why brace walls?
    *To make them rigid and to keep corners square and plumb.*

12. What is the function of the cap or double top plate?
    *To tie the walls and partitions together at the top and give them extra strength.*

13. How is a conventional roof constructed?
    *One piece at a time.*

14. Name three cuts that must be laid out on a common roof rafter.
    - *Top, ridge, or plumb cut*
    - *Bird's mouth*
    - *Tail cut*

15. Define the term "unit rise."
    *It is the degree of slope for every foot of the roof.*

16. When using the framing square, does one refer to the numbers on its inside, or outside edges?
    *Always use the numbers on the outside edge of the framing square.*

17. What is a pattern rafter?
    *Often the first rafter that's cut. Once it has been checked for accuracy, it is used as a guide to lay out the rest of the rafters.*

18. What does it mean to say that "the overhang rafters have been left to run wild"?
    *It means that they have not yet been cut to uniform length.*

19. Explain the difference between framing an opening in a roof and an opening in a floor.
    *Basically, there is no difference. Just as trimmers are used as double joists in floor construction, they are used as double rafters to frame roof openings. Headers are also used similarly in roof and floor framing.*

20. Name three major functions of sheathing.
    - *Add strength and rigidity*
    - *Provide a nailing surface*
    - *Help carry the load*

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### Inside the Carpenter's Toolbox

- VHS/DVD
- Correlates to educational standards
- Includes viewable/printable instructor's guide
- Recommended for high school, vocational/technical school, and adult education
- Order #37046

How do carpenters turn building materials into buildings? To find out, this program takes a look at the tools and construction materials carpenters depend on every day. After a rundown on manufactured wood products like plywood, OSB, I-beam joists, and glu-lams as well as the fasteners that hold them all together, the video covers a variety of carpentry tools divided into four groups: planning and drawing, measuring and marking, cutting and shaping, and fastening and assembly. Types of carpenters—rough, finish, and general—are also mentioned, and safety is reinforced throughout. A Shopware Production. (20 minutes) © 2007.

### Carpenters (from the series *Made with the Trades)*

- VHS/DVD/Digital On-Demand
- Preview clip online (search on 32261)
- Correlates to educational standards
- Order #32261

What's it like working as a carpenter? How do you get started and what kind of wages can you expect? This program takes you to actual work sites to provide a real-world introduction to carpentry. Apprentice and journeyman carpenters discuss what they enjoy about their trade and how they began their careers. Footage of ongoing projects highlights the work itself, while interviews answer many practical questions students might have about the trade. A Shopware Production. (13 minutes) © 2003.

### Carpentry (from the series *Vo/Tech Ins and Outs*)

- VHS/DVD/Digital On-Demand
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This fast-paced, entertaining, and intriguing series introduces several occupations in the vast career pathway of vocational and technical trades. Viewers are taken on a journey through many different areas including welding, masonry, electrical, residential construction, and HVAC. Each program focuses on one of these particular trades and includes interviews with students preparing for each career and working professionals on the job. The programs carefully define how the participant began in the field, what the vocation means to them, educational requirements, immediate job opportunities, and how they envision the future of each particular occupation. Important contact information is also provided for students interested in finding out more about vocational training programs. A Shopware Production. (15 minutes) © 2001.


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