

### Lesson #6: Nail types and Their Uses

#### Objectives

Students will be able to...

- Identify nail types and their uses.

#### Common Core Standards

Cabinetmaking and Wood Products Pathway

A1.4, A1.7, A2.1, A2.2, A3.1, A2.3, A6.1, A6.2 A3.4, A6.7, A4.1, A5.1, A5.2, & A5.4

Residential and Commercial Pathway

D2.1, D2.2, D3.1, D3.3, & D4.1

Reading 11-12.4

Writing 11-12.1

RIST 11-12.2

Problem Solving/Critical Thinking 5.4

Health and Safety 6.2, 6.3, 6.6, & 6.12

Responsibility and Leadership 7.4 & 9.3

Demonstration and Application 11.1

Technical Knowledge and Skills 10.1, 10.2, & 10.3

#### Materials

Nail Types and Their Uses Handout

Nail Types and Their Uses Chart

YouTube video <https://www.youtube.com/watch?v=CUTTmtLKD2g>

YouTube video <https://www.youtube.com/watch?v=ZBfkmPt-WYw>

#### Lesson Sequence

- Pass out *nail types and their uses handout*. Have students read this handout in partners and fill in the *nail types and their uses chart*. (20 minutes)
- Review the chart and the student's finding together as a class. (10-15 minutes)
- Watch the *YouTube video* <https://www.youtube.com/watch?v=CUTTmtLKD2g> (5 minutes)
- Watch the *YouTube video* <https://www.youtube.com/watch?v=ZBfkmPt-WYw> (3 minutes)
- Answer any questions students may have from the videos. (5 minutes)

**Assessment**

Collect student's charts they filled in and use this data to determine if students understand the material. Check for understanding by questioning and calling on random students.

**Accommodations/Modifications**

One-on-One Support  
Provide a Chart Already Filled in For Students  
Strategic Pairing  
Highlight Important Information on Handout

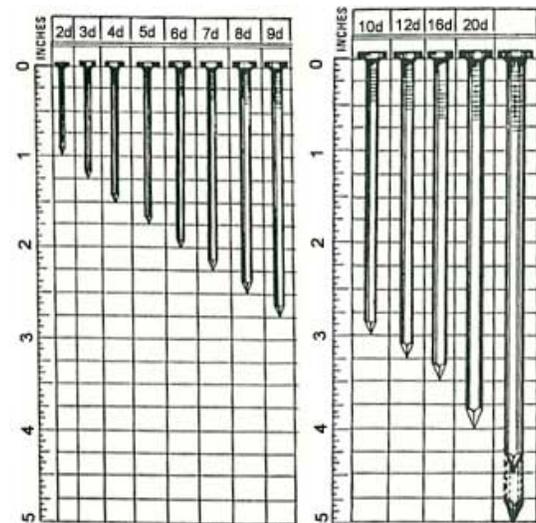
## Nail Types and Their Uses

Although nails are the most commonly used fastener, the use of staples to attach wood structural members is growing. For certain operations, screws and bolts are required. In addition, various metal devices exist for anchoring materials into concrete, masonry, and steel.

### NAILS

The parts of the nail are the head, shank or shaft, point, and the gripper marks – slight grooves incised into the shank near the head of most (but not all) varieties of nails.

Sometimes, nails are referred to by their length in inches, but more often the traditional terminology of the penny is used. Penny is abbreviated with the lowercase letter d. It

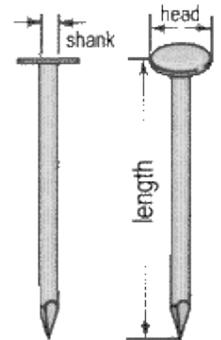


indicates the length of the nail. A 6d (6-penny) nail is 2-inches long. A 10d (10-penny) nail is 3-inches long. These measurements apply to common, box, casing, and finish nails only. Nails shorter than one inch are generally identified by fractions of an inch rather than by pennies. Brads and small box nails are identified by their actual length and gauge number.

Nails are made of brass, aluminum, and copper, though most often of steel. The steel may be plain or galvanized, the latter being the right choice for damp applications where a rust-resistant nail is required.

A nail, whatever the type, should be at least three times as long as the thickness of the wood it is intended to hold. Two-thirds of the length of the nail is driven into the other piece of wood for proper anchorage. The other one-third of the length provides the necessary anchorage of the piece being fastened. Protruding nails should be bent over to prevent damage to materials and injury to personnel.

There are a few general rules to be followed in the use of nails in building. Nails should be driven at an angle slightly toward each other to improve their holding power. You should be careful in placing nails to provide the greatest holding power. Nails driven with the grain do not hold as well as nails driven across the grain. A few nails of proper type and size, properly placed and properly driven, will hold better than a great many driven close together. Nails can generally be considered the cheapest and easiest fasteners to be applied.



## Basic Nail Types

Nails, the most common type of metal fasteners, are available in a wide range of types and sizes. Wire nails are indeed the rule today, but not all wire nails are the same. They vary in size and in other ways as well.



**Common Nail** - As the name suggests, these are your everyday nails.

Used for rough construction work, the common nail can be purchased in lengths varying from one to six inches (2d to 60d). The largest common nails are usually known as spikes.

**Box Nail** - These look like common nails but are thinner. This means they are less likely to cause splits in the wood; as they displace less wood, they also have less holding power, so are not generally used where structural strength is critical. Box nails are generally available in lengths from one inch to three and a half inches.

**Finishing Nail** - Finishing nails are (surprise, surprise) used for finish work. When the nail head will show in the final product (as with moldings, for example), finishing nails are often used because their barrel-shaped heads are small and can be driven below the surface of the wood using a nail set (a technique called countersinking). Finishing nails are generally available in lengths ranging from one to four inches (2d to 20d).

**Casing Nail** - A near relation of the finishing nail, the casing nail is slightly larger and has increased holding power. It is most often used for attaching moldings such as window and door casings where added strength is required.

**Brad** - Brads are essentially diminutive finishing nails, proportionately smaller in diameter and length (one inch or less). They are used in making frames, attaching plywood paneling, and in cabinet-work.

## Specialty Nails

Various nails are manufactured for specific purposes, with differently proportioned and shaped heads and shafts. Some nails are specially coated with zinc, cement, or resin materials. Some have threading for increased holding power of the nails. Nails are made from many materials, such as iron, steel, copper, bronze, aluminum, and stainless steel.

**Annular Ring Nail** - Often sold in galvanized steel, annular ring nails are commonly used as siding nails, to hold clapboards or shingles in place, or for underlayment or paneling. They are thin, lined with rings for added holding power, and resistant to rust.

**Spiral Flooring Nail** - Spiral flooring nails feature a spiraled shaft and were traditionally used for nailing subfloors. Nail guns and the specially designed nails used in them have superseded these nails in much construction work today.

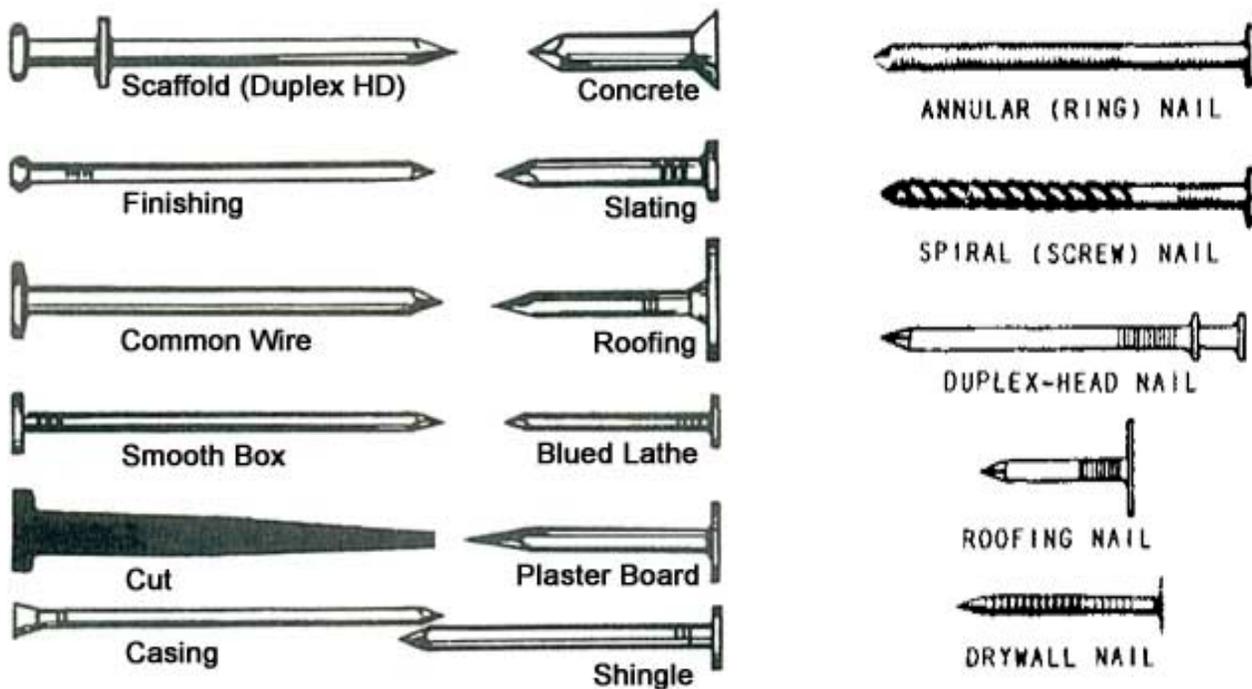
**Duplex Nail** - This is a variation of the common nail. Featuring a second head formed a short distance down the shaft from the end of the nail, the duplex nail is used for temporary construction (like scaffolding and staging) because it can be driven snug yet be easily removed.

**Roofing Nail** - Roofing nails have disproportionately large, round heads and heavier shafts for their length. They are designed to hold roofing materials in place, composition and asphalt-based materials. In order to resist rust, roofing nails are heavily galvanized or made of aluminum. Three-quarter inch to one-and-three-quarter-inch sizes are usual; the penny system is not used in reference to roofing nails.

**Drywall Nails** - Drywall nails, which feature rings on their shafts, are sold for hanging wallboard; their heads are traditionally driven slightly below the surface of the plaster panel (the hammer stroke creates a dimple that is then filled in with joint compound or plaster). Cement-coated nails are roughly the size and weight of box nails but are coated with a resin for added holding power. They're used to nail outside sheathing.

**Masonry Nail** - Several types of masonry nails are sold; all are designed to be driven into brick or concrete walls. These hard nails may be rectangular in section or have fluted shafts, but all are hardened to resist bending and breaking as they are driven into almost rock-hard materials. Given the nature of masonry materials, be sure to wear safety glasses or goggles when nailing masonry nails, as flying chips pose a danger to your eyes.

**Cut Flooring Nail** - The lone surviving direct descendant of the once dominant cut nail is the flooring nail. These nails are large, strong, and are often used in a nailing machine.



**Nail Types and Their Uses Chart**

Name	Description & Picture	Uses	Sizes