



Technology Engineering I & II

# HAND TOOL IDENTIFICATION

# Hand Tool Identification



**Adjustable wrench**—can be used on a variety of bolts and nuts. It should be used only when a box or open-end wrench is not available.

# Hand Tool Identification



**Auger bit**—for an electric drill.

An Auger bit is used to bore holes into soft materials such as wood. Can also be used with a hand drill or brace.

# Hand Tool Identification



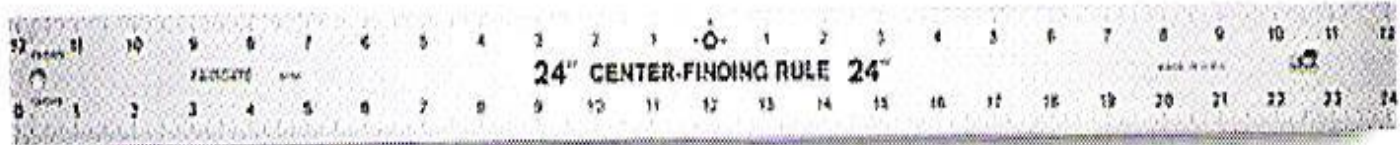
**Ball-peen hammer**—one face is used to strike cold chisels and punches; the other face is for shaping soft metal.

# Hand Tool Identification



**Band clamp**—clamps round, irregular, or box-shaped workpieces. Steel corners apply even pressure around irregular shapes.

# Hand Tool Identification



**Bench rule**—a steel or hardwood rule that is used for short measurements. One side is usually divided into eighths, the other into sixteenths.

# Hand Tool Identification



**Brace**—bores larger holes in wood by hand. Special auger bits must be used with the brace.

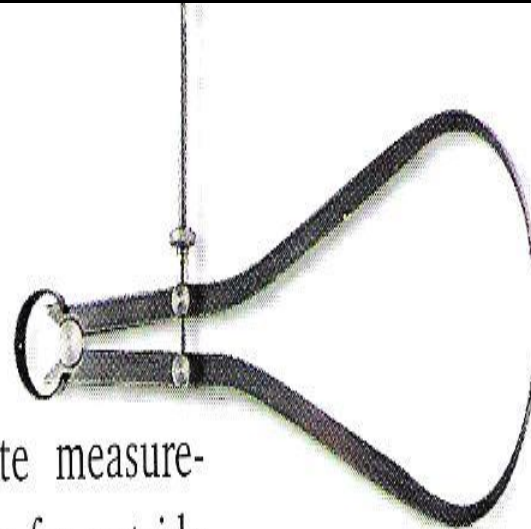
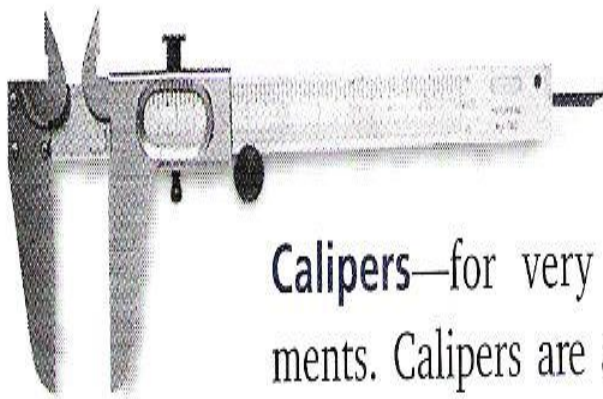
# Hand Tool Identification



**Brad-point bit**—has a center point to help guide the drill bit to the desired position. It drills a clean hole, like those needed for fine woodworking.



# Hand Tool Identification



**Calipers**—for very accurate measurements. Calipers are available for outside and inside measurements.

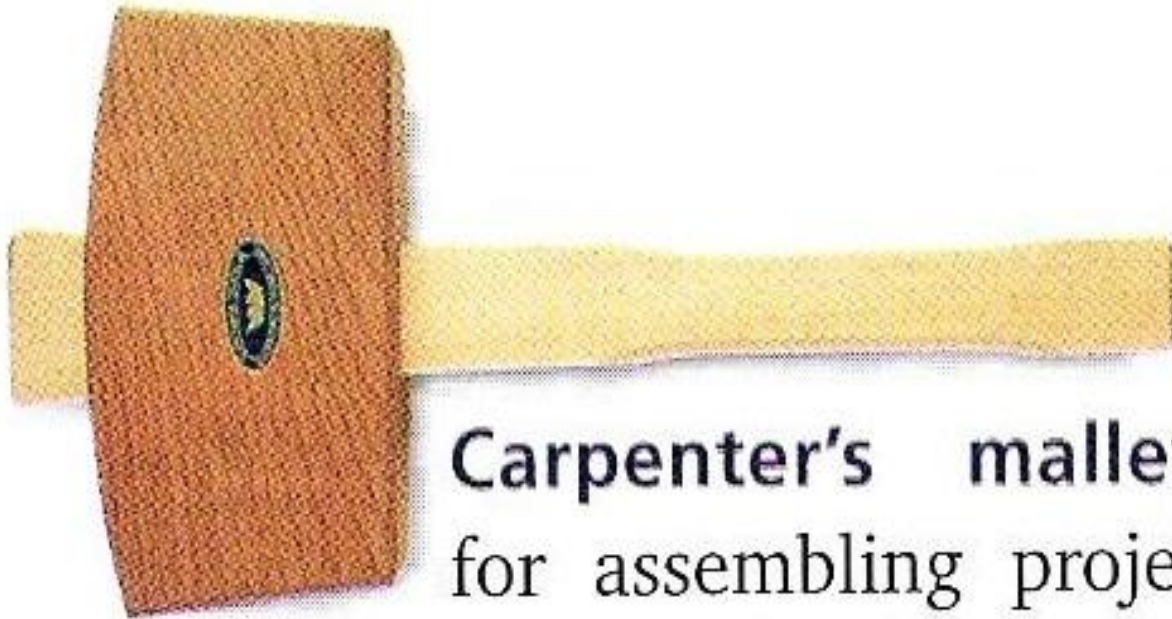
# Hand Tool Identification

ITS  
or

**Carpenter's level**—used to check level and plumb. Digital models are also available. Standard lengths are 24" and 48".



# Hand Tool Identification



**Carpenter's mallet**—used for assembling projects and striking chisels.

# Hand Tool Identification



**C-clamp**—good for small jobs and when a clamp is needed in a localized area.

# Hand Tool Identification



**Chalk line**—marks cutting or layout lines between two points. The case is filled with chalk and a long line of cord on a spool. Hold the line taut between the two points and snap it to leave a line of chalk.

# Hand Tool Identification



**Claw hammer**—the most commonly used hammer. The curved claw provides leverage for pulling nails. The face may be flat, bell-shaped, or checkered. For most work, a 13- or 16-ounce head weight is appropriate.

Rubb

# Hand Tool Identification



**Open-end wrench**—has a different size opening at each end.



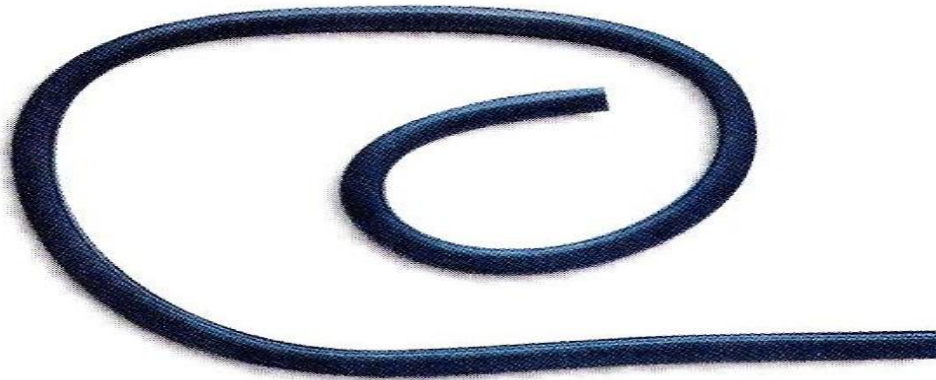
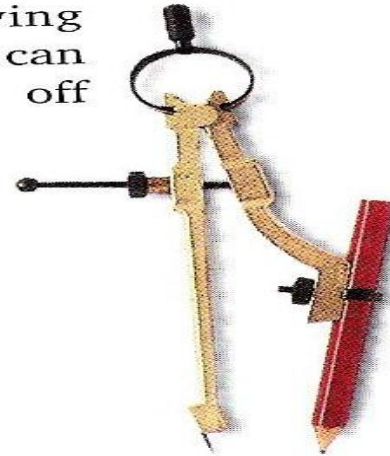
**Combination wrench**—has both box- and open-end heads. Both ends are for the same size bolt.

Combination wrench is also known as a box end-open end wrench.

# Hand Tool Identification

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**Compass**—for drawing circles and arcs. It can also be used to step off equal measurements.

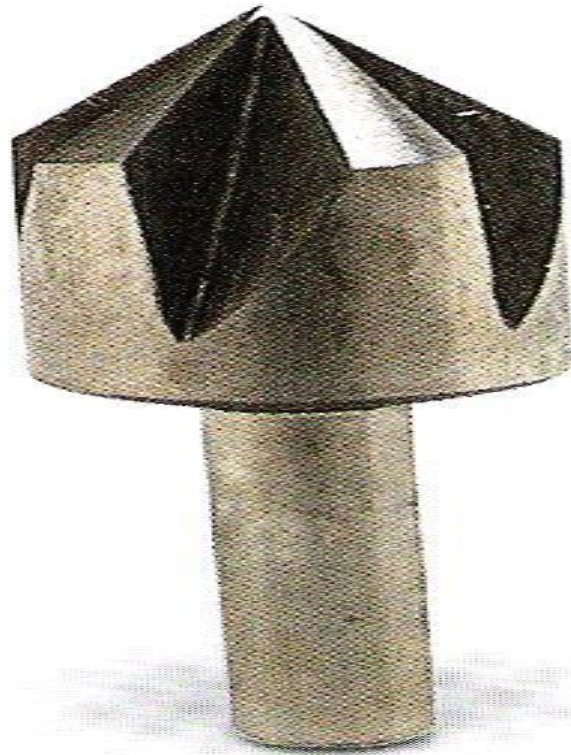


**Flexible curve**—bends to and holds any shape for drawing irregular curves.

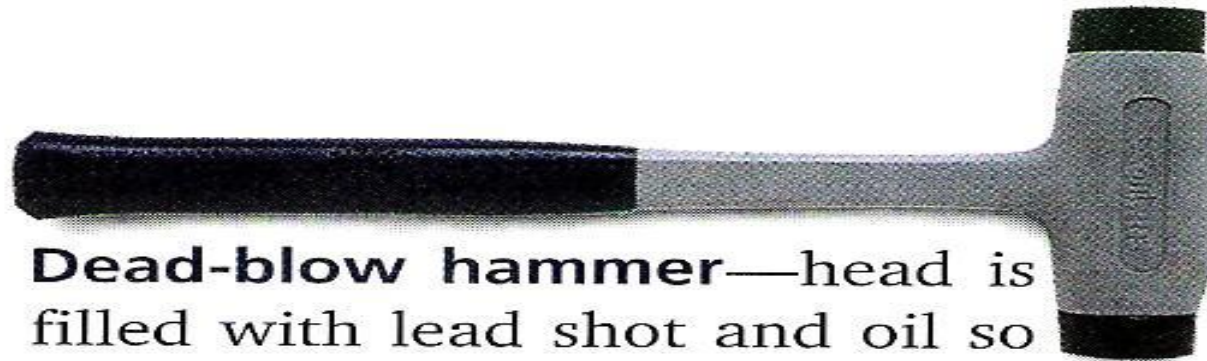


# Hand Tool Identification

**Countersink bit**—drills a neat taper for the head of a wood screw.



# Hand Tool Identification



**Dead-blow hammer**—head is filled with lead shot and oil so that the energy of the impact is absorbed in the head. This eliminates any rebound in assembly work.

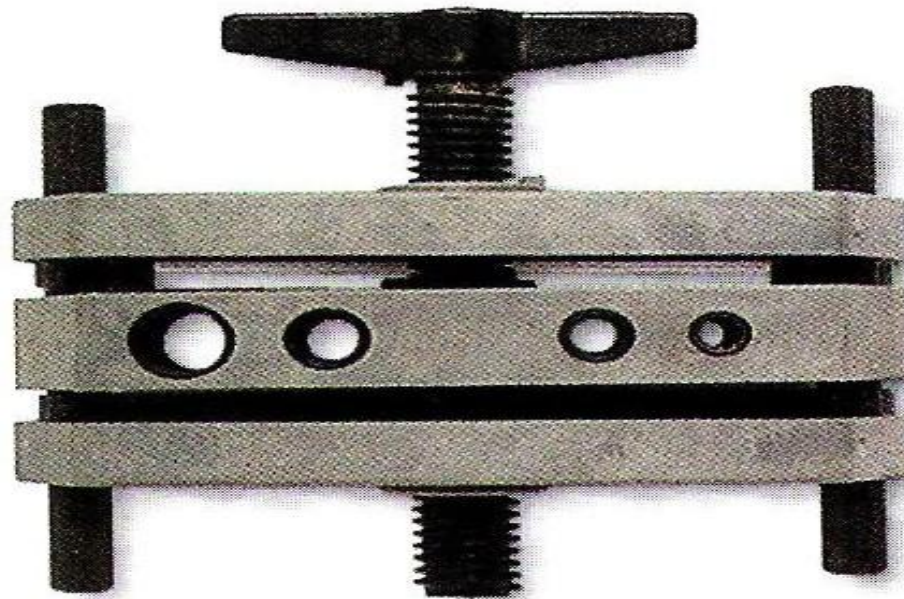
# Hand Tool Identification



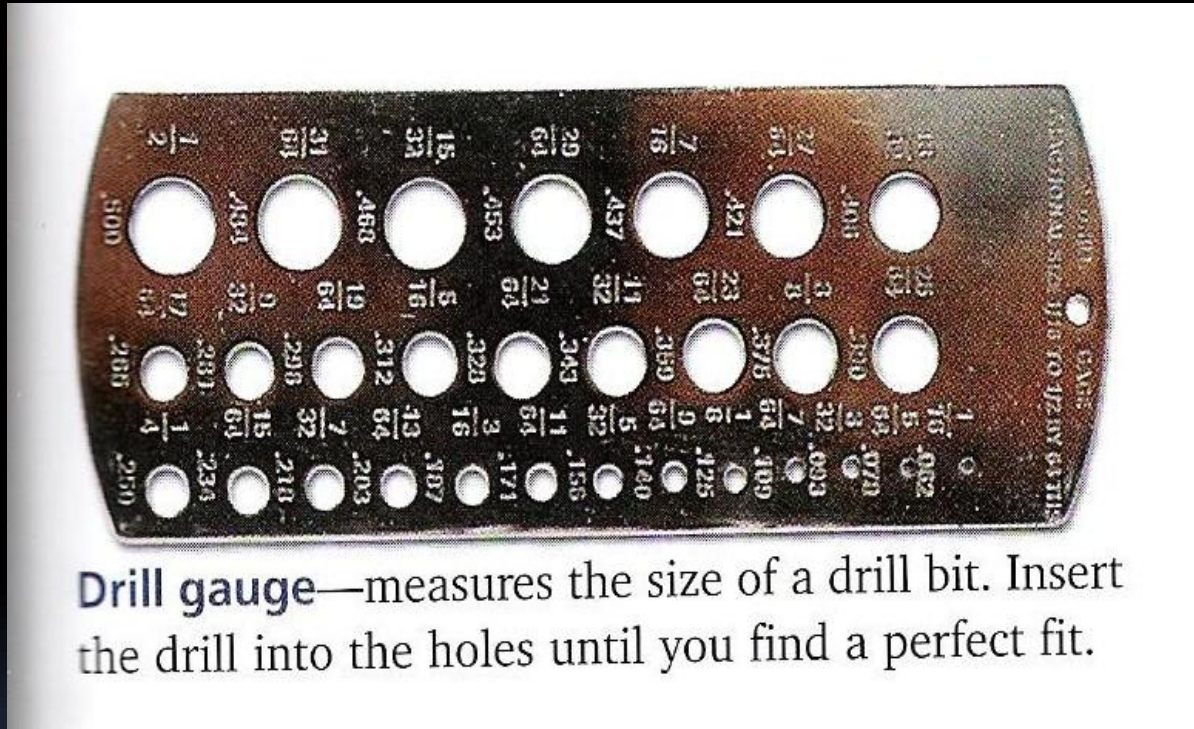
**Diagonal-cutting pliers**—sometimes called *side-cutting pliers*. They are designed for cutting wire and thin metal.

# Hand Tool Identification

**Doweling jig**—Centers dowel holes in the end or edge of wood. The jig clamps to the wood and centers itself on the edge.

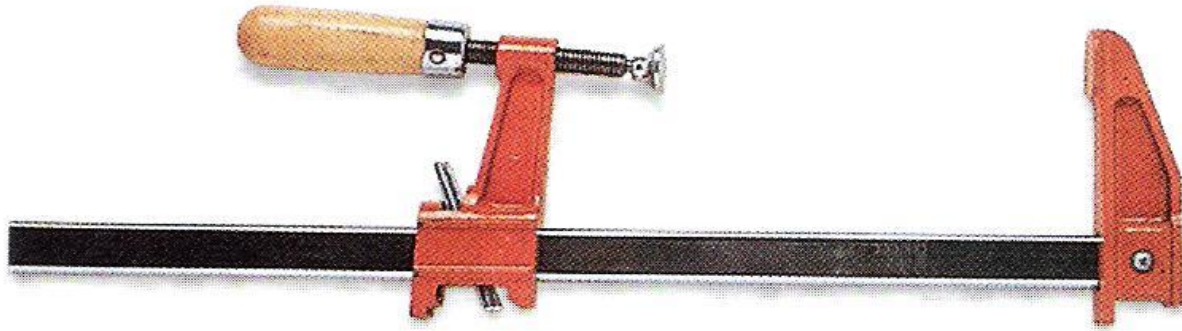


# Hand Tool Identification



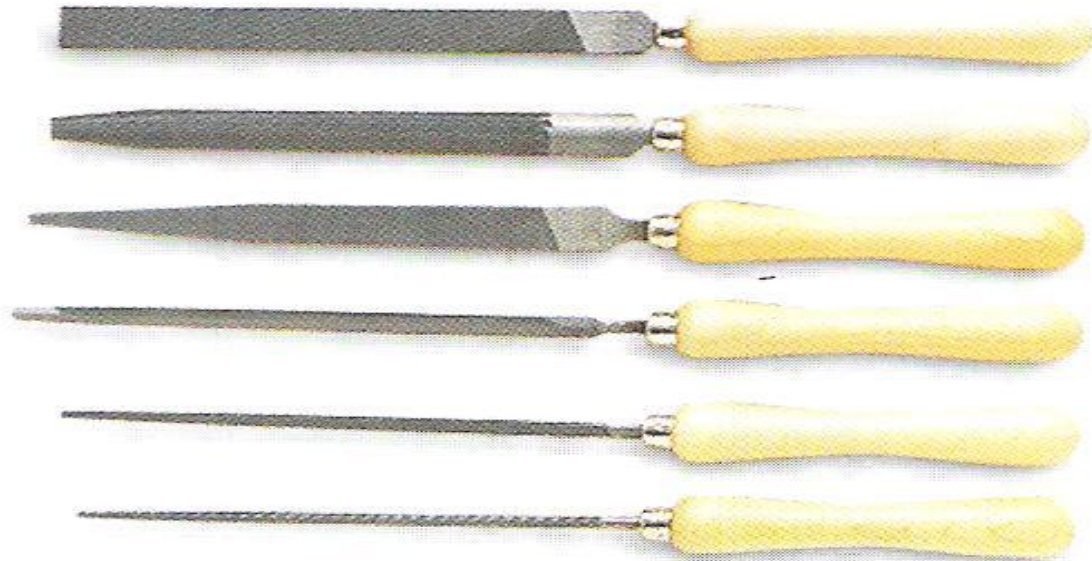
**Drill gauge**—measures the size of a drill bit. Insert the drill into the holes until you find a perfect fit.

# Hand Tool Identification



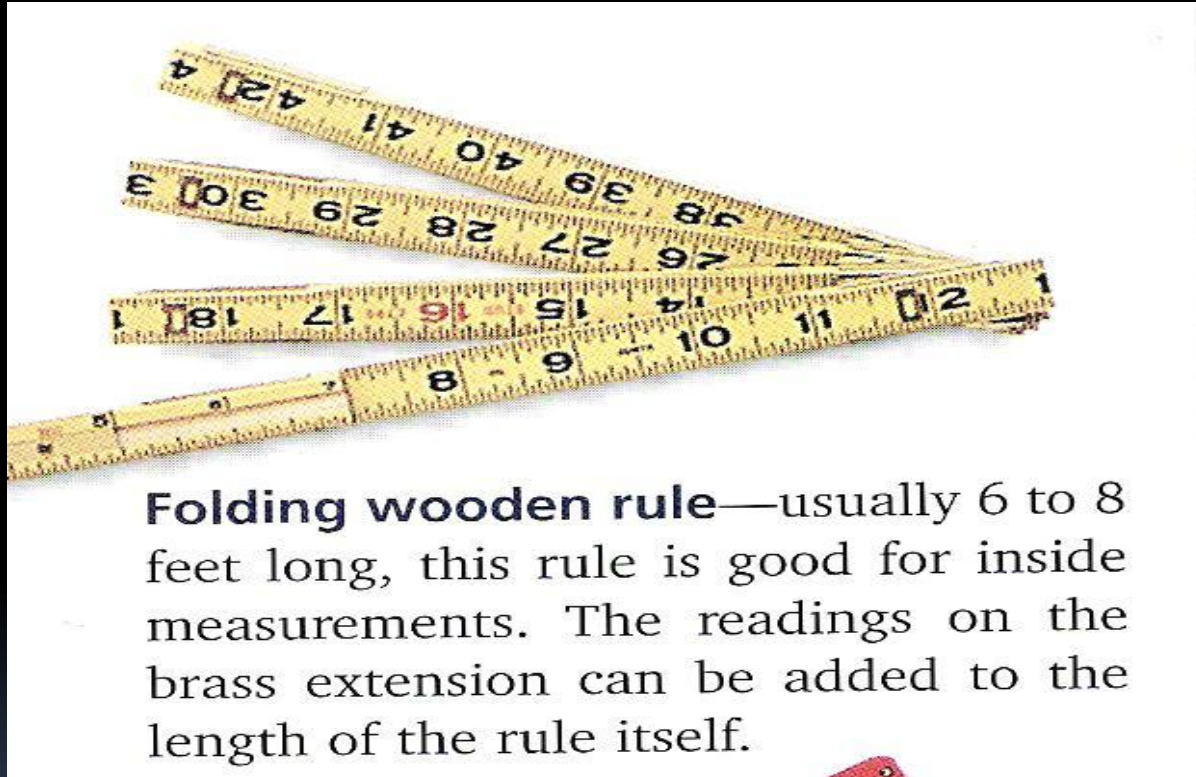
**Fast-action clamp**—small bar clamp that is quick and easy to operate; often used as a substitute for a C-clamp.

# Hand Tool Identification



**File set**—a good set usually includes a flat file, cabinet file, triangle file, round file, and half-round file.

# Hand Tool Identification



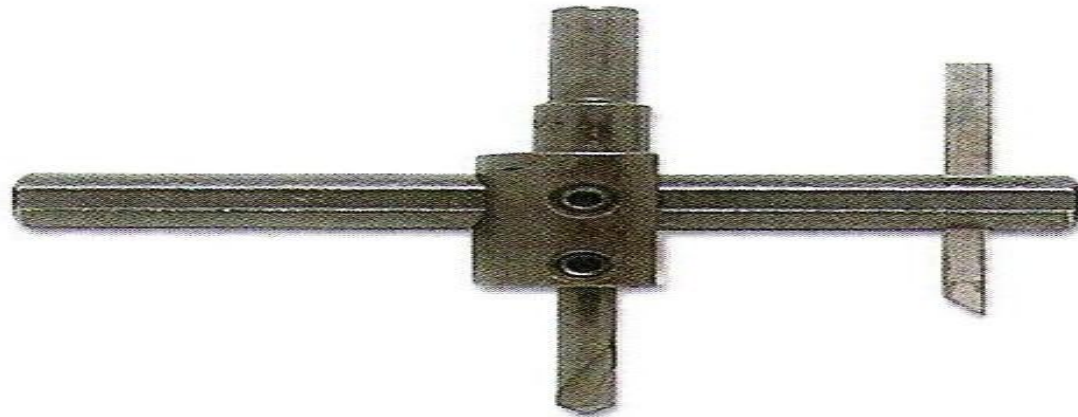
**Folding wooden rule**—usually 6 to 8 feet long, this rule is good for inside measurements. The readings on the brass extension can be added to the length of the rule itself.



# Hand Tool Identification

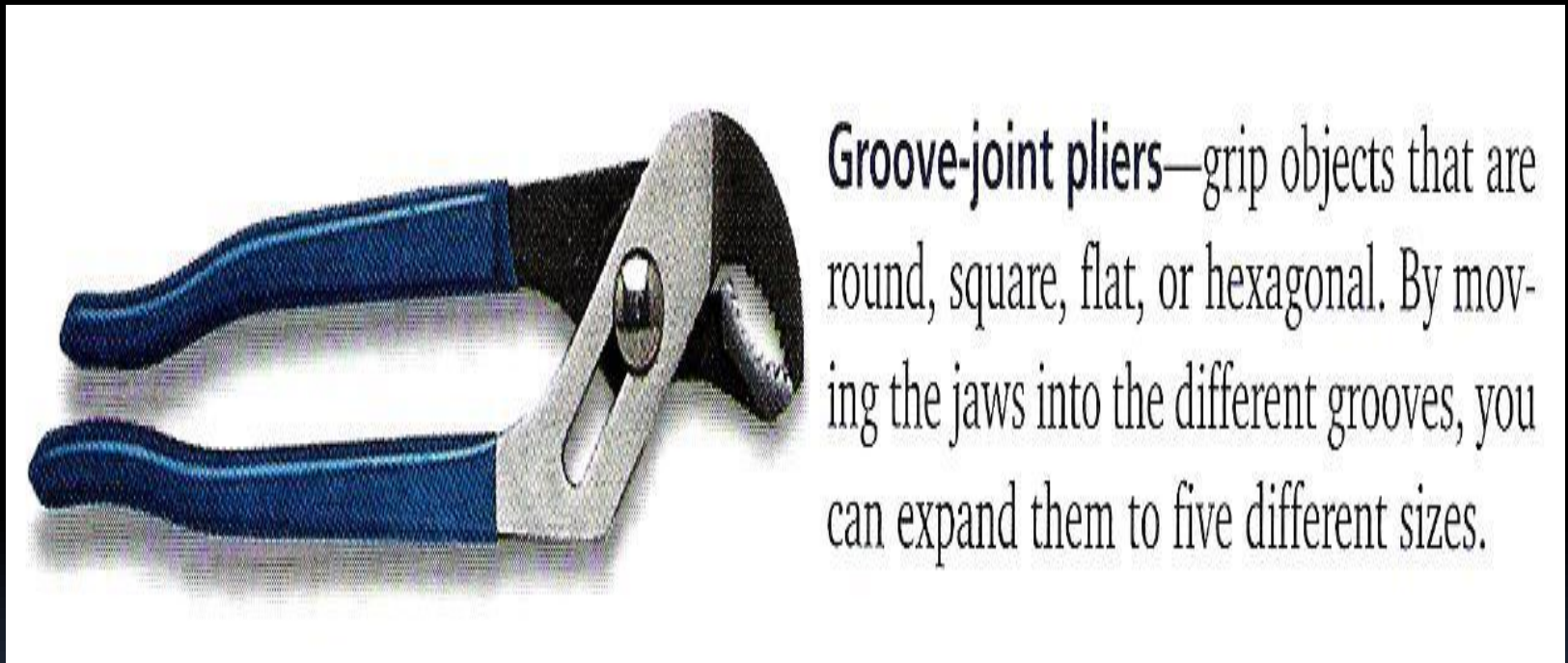


**Forstner bit**—drills a smooth, shallow hole. It has a small center spur, so it can drill a nearly flat-bottomed hole. Forstner bits should be used only in a drill press.



**Fly cutter**—also called a *circle cutter*. It should be used only in a drill press.

# Hand Tool Identification



**Groove-joint pliers**—grip objects that are round, square, flat, or hexagonal. By moving the jaws into the different grooves, you can expand them to five different sizes.

# Hand Tool Identification

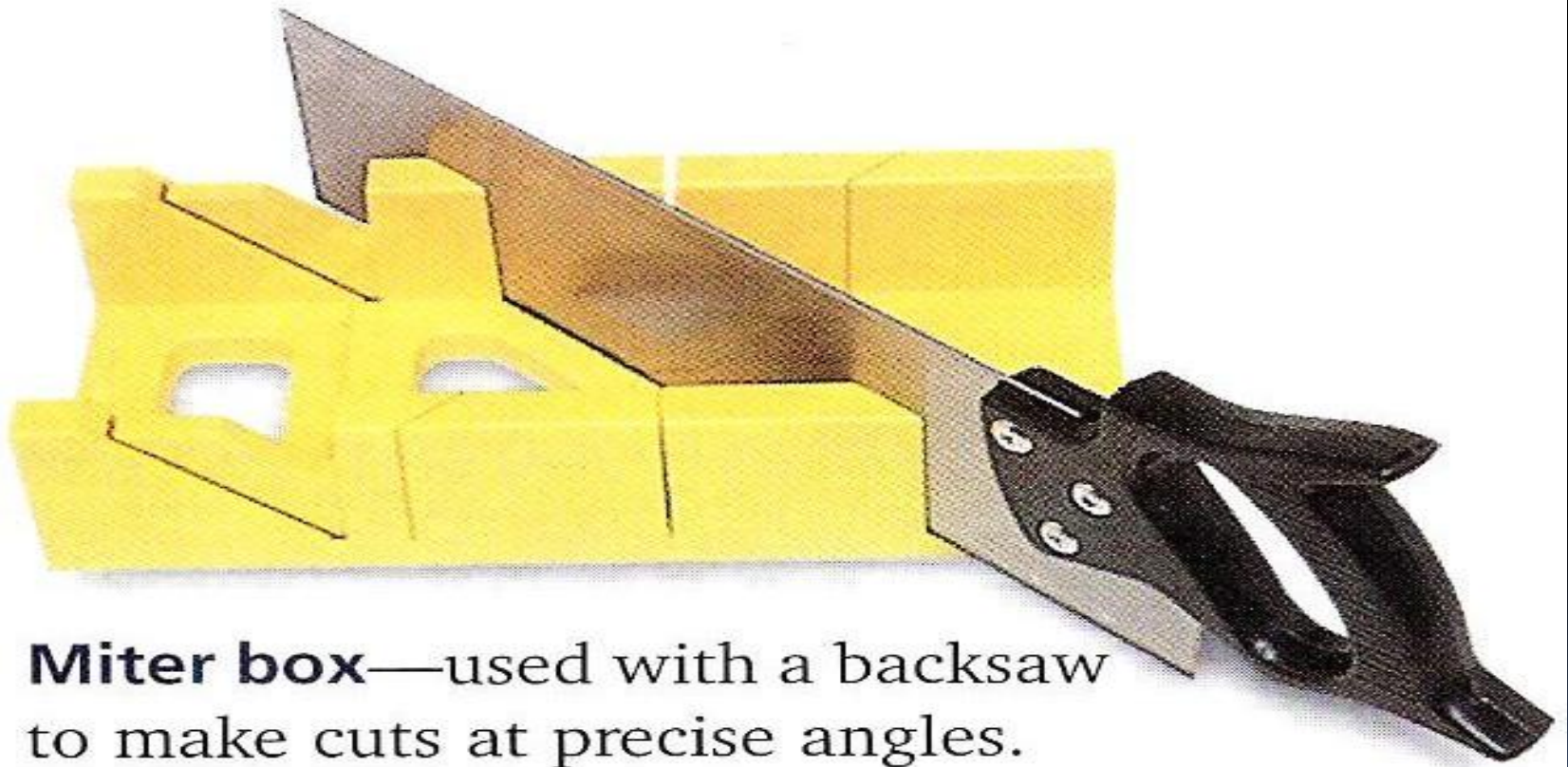


**Hand drill**—bores holes in wood, plastic, and soft metal. It uses twist drills with  $\frac{1}{4}$ " shank bits.



**Push drill**—operates by pushing the handle up and down in a repetitive motion. It drills holes up to  $\frac{11}{64}$ ".

# Hand Tool Identification



**Miter box**—used with a backsaw to make cuts at precise angles.

# Hand Tool Identification



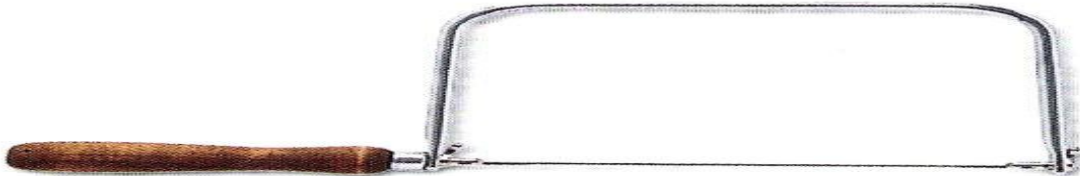
**Ripsaw**—cuts with the grain of the wood. Normal blade is 26" long and has 4-7 teeth per inch.



**Backsaw**—a fine-tooth crosscut saw with a heavy metal band across the back to strengthen the thin blade. It is used to make fine cuts for joinery and is often used in a miter box.



**Dovetail saw**—a small backsaw that is used for making fine joints. It has 16-20 teeth per inch.



**Coping saw**—has a U-shaped frame; used to cut curves, scroll work, and molding as finishing trim.

# Hand Tool Identification

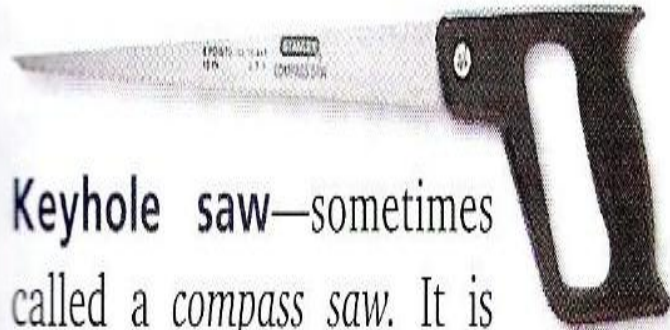


**Wallboard saw**—sometimes called a *dry-wall saw*; used to cut holes in drywall and plasterboard.

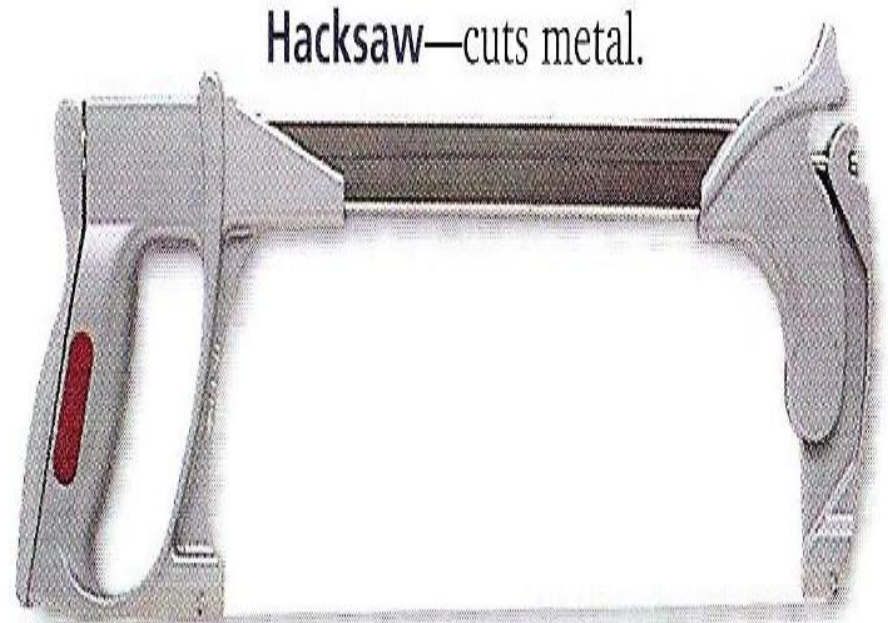
**Crosscut saw**—cuts across the grain of wood. Normal blade is 26" long and has 10-12 teeth per inch.



# Hand Tool Identification

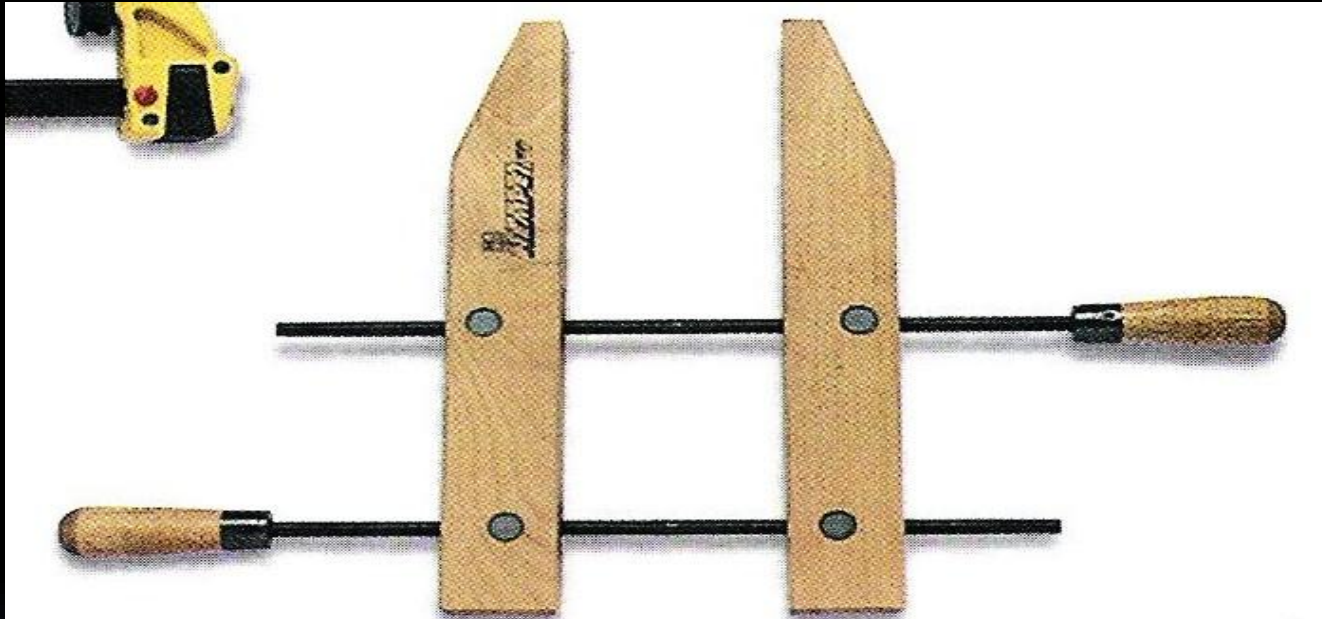


**Keyhole saw**—sometimes called a *compass saw*. It is used to cut curves and holes in plywood and wallboard.



**Hacksaw**—cuts metal.

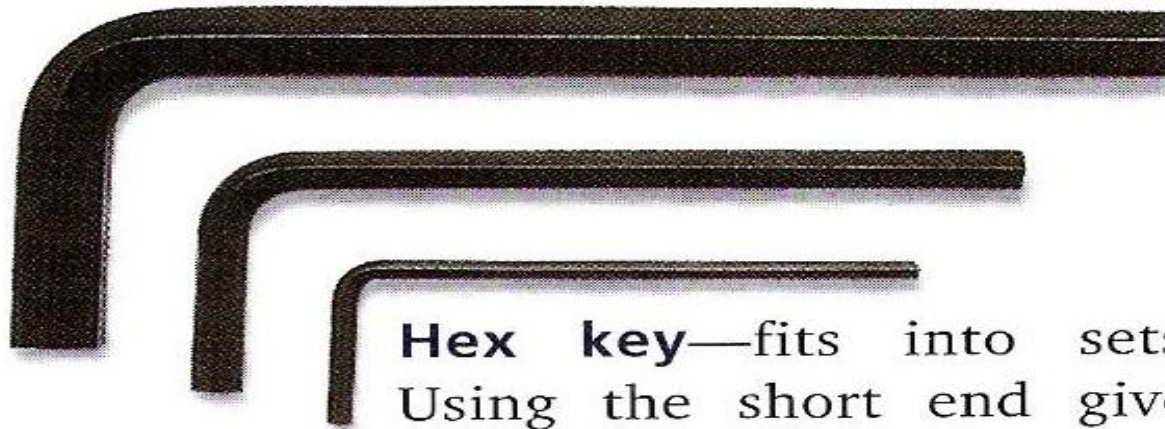
# Hand Tool Identification



**Hand-screw clamp**—perfect for odd-shaped assemblies; will even clamp round objects. Each jaw works independently, allowing the jaws to angle toward or away from each other.



# Hand Tool Identification



**Hex key**—fits into setscrews.  
Using the short end gives you  
greater torque.

# Hand Tool Identification



**Hole saw**—cuts large holes in wood, plastic, and thin metal. It is mounted onto a special arbor with a bit in the middle to guide the saw into the wood in the correct location.

# Hand Tool Identification



**Keyless drill chuck**—A chuck that does not require a key for tightening. Drill bits can be tightened by hand.

# Hand Tool Identification

**Line level**—a miniature level attached to a taut string line between two points. It is handy for landscaping, erecting fences, and doing masonry work.

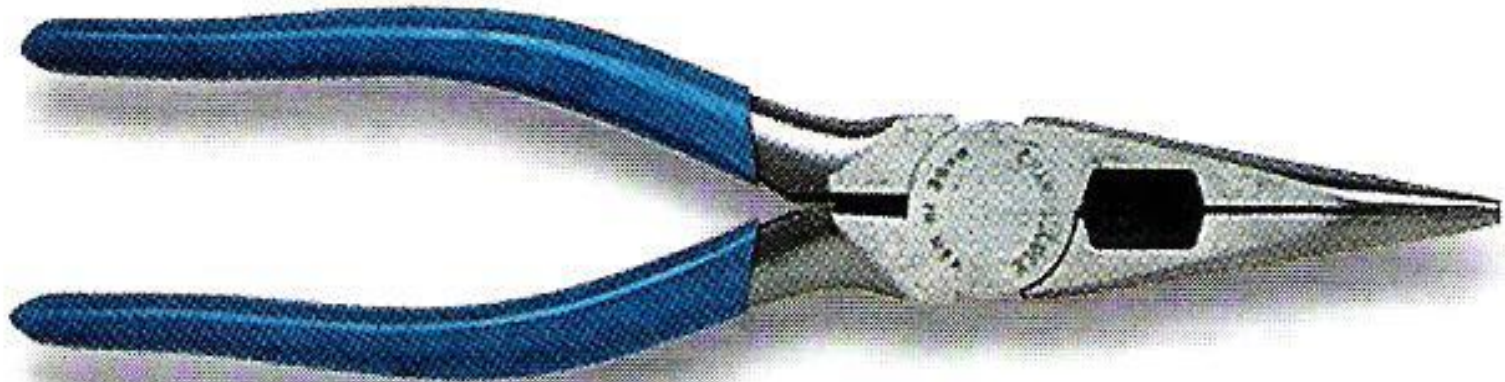


# Hand Tool Identification



**Lineman's pliers**—used mainly for twisting and cutting wire.

# Hand Tool Identification



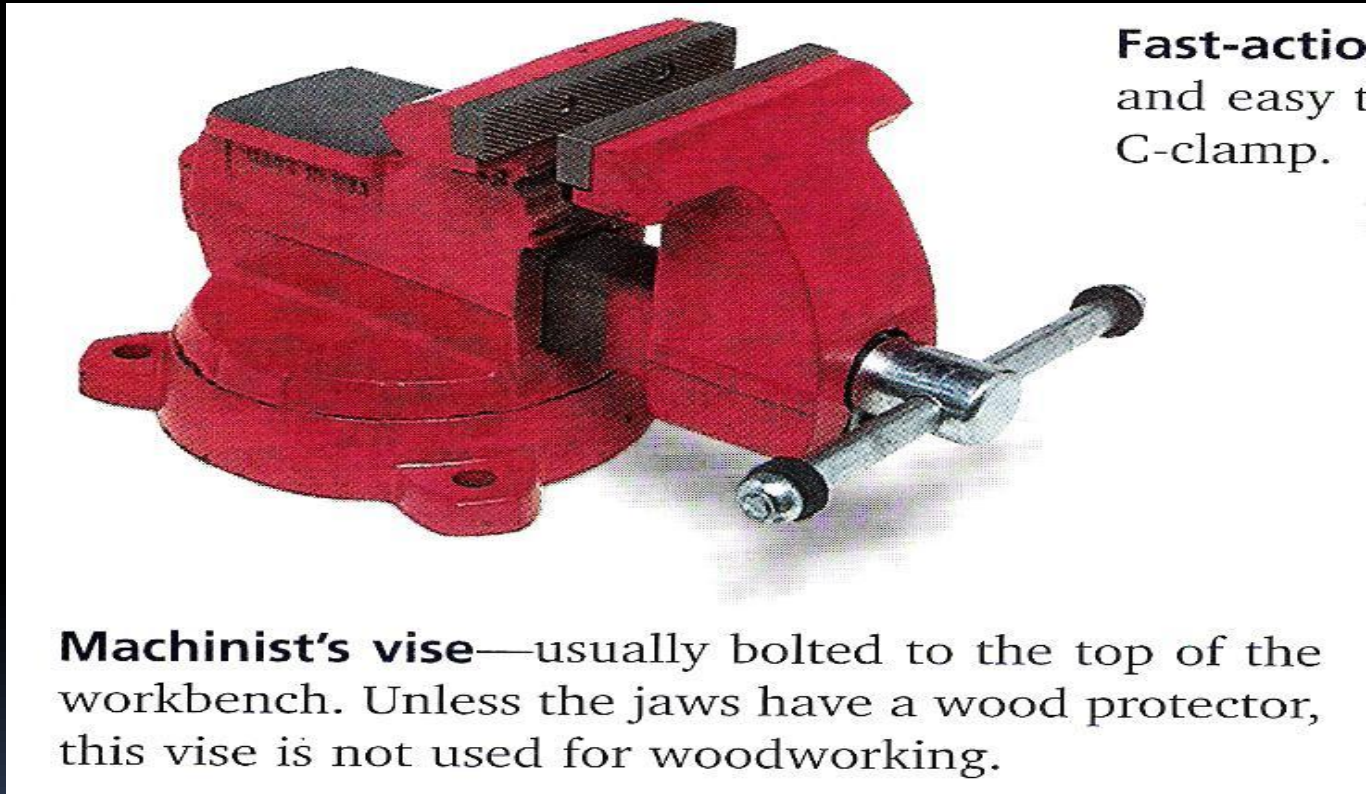
**Long-nose pliers**—used to hold a small object, especially in electrical work. Sometimes they have a wire cutter on the side for cutting small-gauge wire.

# Hand Tool Identification



**Long tape measure**—used for large measuring jobs such as measuring a building site or laying out a house.

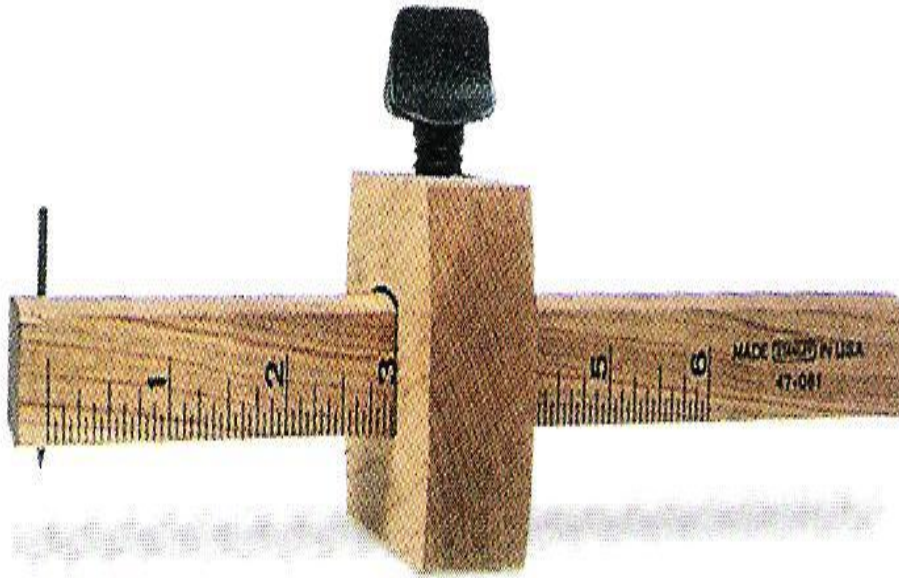
# Hand Tool Identification



**Machinist's vise**—usually bolted to the top of the workbench. Unless the jaws have a wood protector, this vise is not used for woodworking.

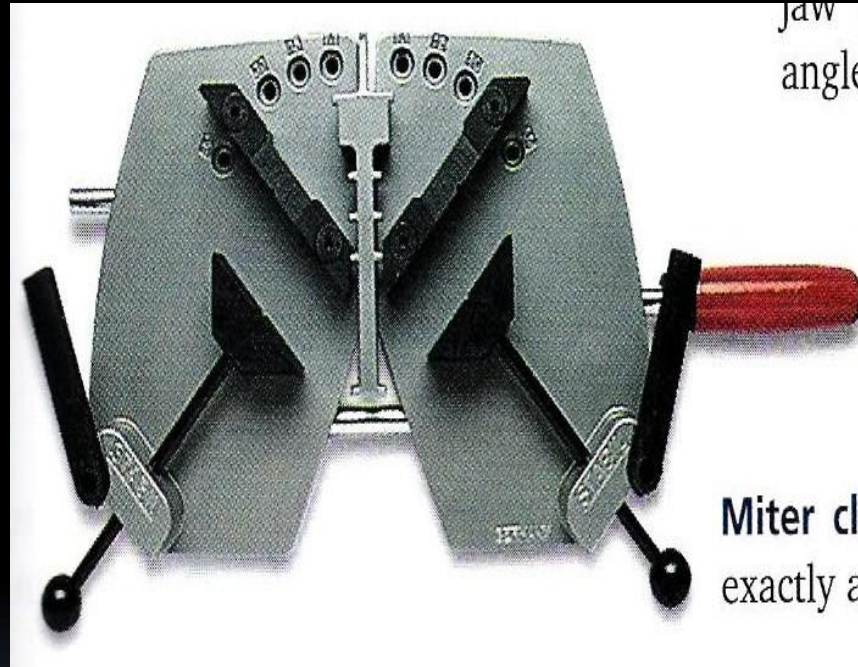


# Hand Tool Identification



**Marking gauge**—accurately draws a line parallel to any straight edge at a distance you specify.

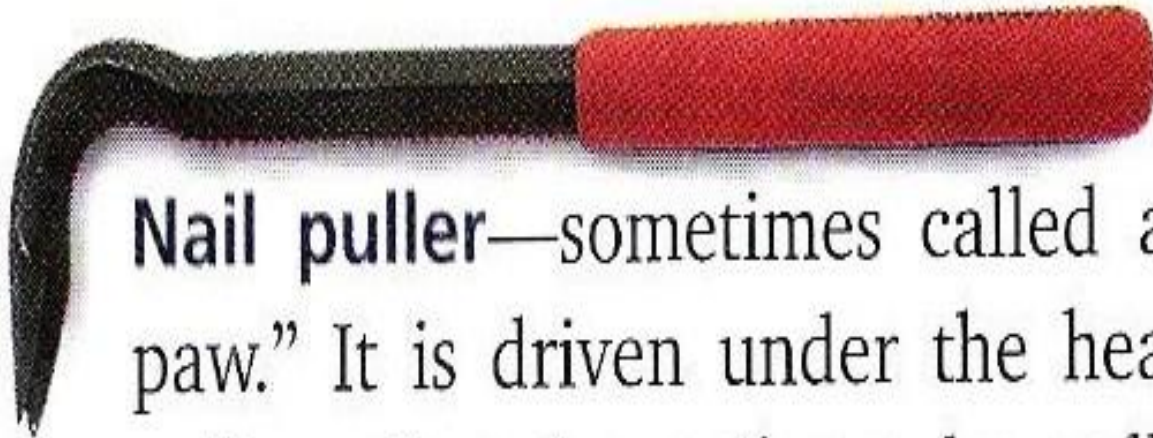
# Hand Tool Identification



Each jaw works independently, allowing the jaws to angle toward or away from each other.

**Miter clamp**—designed to hold the workpieces at exactly a 90° angle.

# Hand Tool Identification



**Nail puller**—sometimes called a “cat’s paw.” It is driven under the head of a nail so that the nail can be pulled out more easily.

# Hand Tool Identification

## Nails & Fasteners

Nails, glue, or some kind of fastener is almost always needed to hold a project together. It is important to become familiar with the many types of fasteners because they are so often used in woodworking.

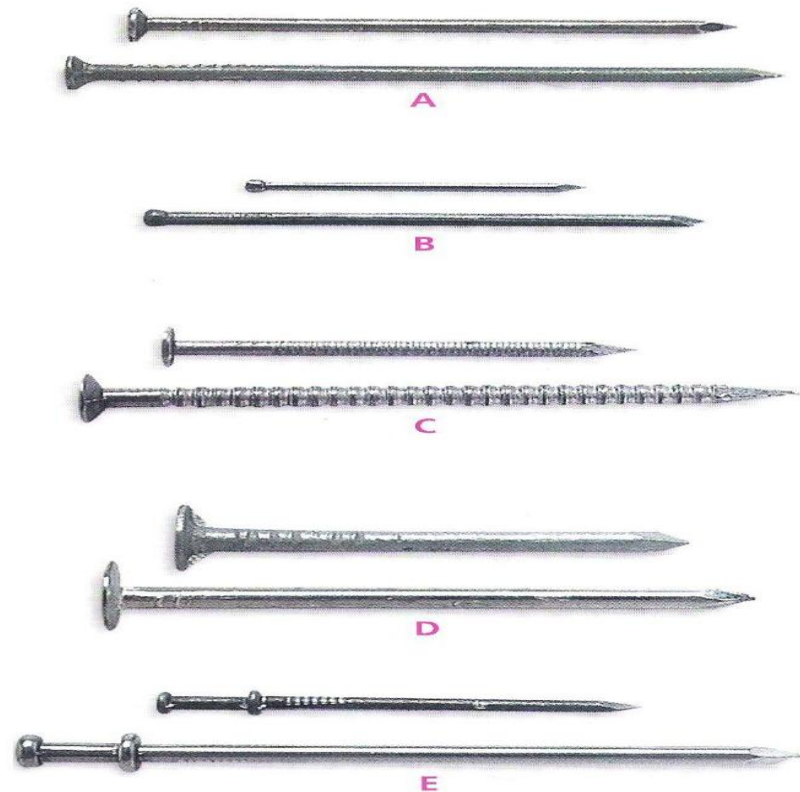
**Common nail (A)**—the most commonly used nail for building construction. It is a heavy-duty nail with a flat head that will not pull through the wood.

**Finishing nail (B)**—used when the nail head is to be concealed. It is set into the wood with a nail set.

**Underlayment nail (C)**—has deep, closely spaced rings; used for installing subfloors because of its good holding power.

**Roofing nail (D)**—usually galvanized and has a large head, so it will not pull through the roofing material.

**Double-headed nail (E)**—for nailing pieces together temporarily. The second head projects above the first so it can be pulled out easily.



# Hand Tool Identification



**Masonry nail (A)**—made of very hard steel that does not bend easily; used to nail into concrete.

**Wood screws (B)**—can have flat or round heads. They are usually zinc-plated or brass.

**Sheet-metal screws (C)**—have a very sharp, self-tapping tip; can pull two pieces of sheet metal together. (Round- and hex-head screws are shown here).

**Drywall screws (D)**—have a bugle-shaped head that cuts through the drywall and anchors in a wood stud.

**Lag screws (E)**—sometimes called *lag bolts*; a heavy-duty wood screw with a hex or square head so that it can be turned by a wrench or ratchet.

**Thumb screws (F)**—machine screws that can be turned by hand because of the wide, thin head on the screw.

# Hand Tool Identification

**Hanger bolt (A)**—has machine-screw threads on one end and wood-screw threads on the other.

**Machine bolt (B)**—a bolt with a square or hex head.

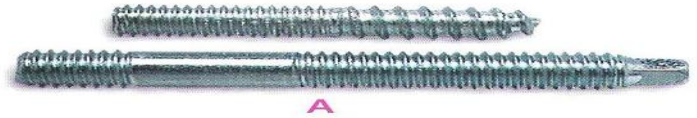
**Stove bolt (C)**—has a round or flat head that can be countersunk.

**Machine screw (D)**—similar to a wood screw, but threaded into metal.

**Carriage bolt (E)**—the square shoulder sinks into the wood and keeps the bolt from turning.

**U-Bolt (F)**—used on pipes and other round objects.

**Eye-bolt (G)**—holds wire or ropes in place.



A



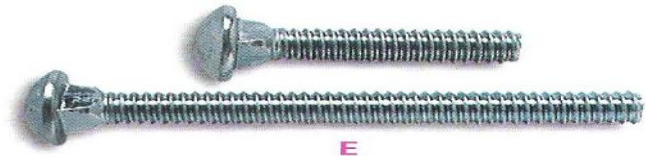
B



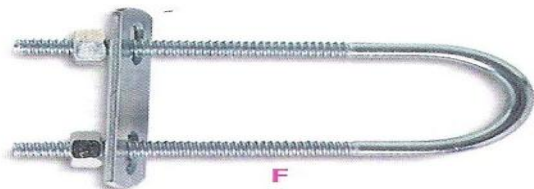
C



D



E



F



G

# Hand Tool Identification



A



B



C



D



E



F



G



**Turnbuckle bolt (A)**—has threaded eyes or hooks that can be moved in or out by turning.

**Threaded rod (B)**—the whole rod is threaded so that objects can be joined over a span.

**Flat washer (C)**—used under a bolt head or nut to spread the load and protect the surface of the wood.

**Lock washer (D)**—sometimes called a *split-ring washer*; helps keep a nut from loosening.

**Toothed washer (E)**—the teeth give additional gripping power to a bolt.

**Nuts (F)**—left to right: hex nut, square nut, lock nut, and cap nut.

**Wing nut (G)**—used when the nut will need to be removed and refastened repeatedly.

# Hand Tool Identification

**Plastic or lead anchor (A)**—inserted into a hole in a concrete or block wall; expands when a screw is driven into it to anchor the screw in place.

**Hollow-wall anchor (B)**—sometimes called a *molly bolt*. Push it into a pilot hole in the wall; it expands as a screw is driven into it to anchor the screw in place.

**Toggle bolt (C)**—a machine screw that has spring-loaded wings. The wings open behind the wallboard when pushed through a pre-drilled hole. It can then be tightened.

**Corrugated fastener (D)**—used on lightweight butt and miter joints.

**Cotter pin (E)**—holds a rod or shaft in place when put through a hole in the shaft.

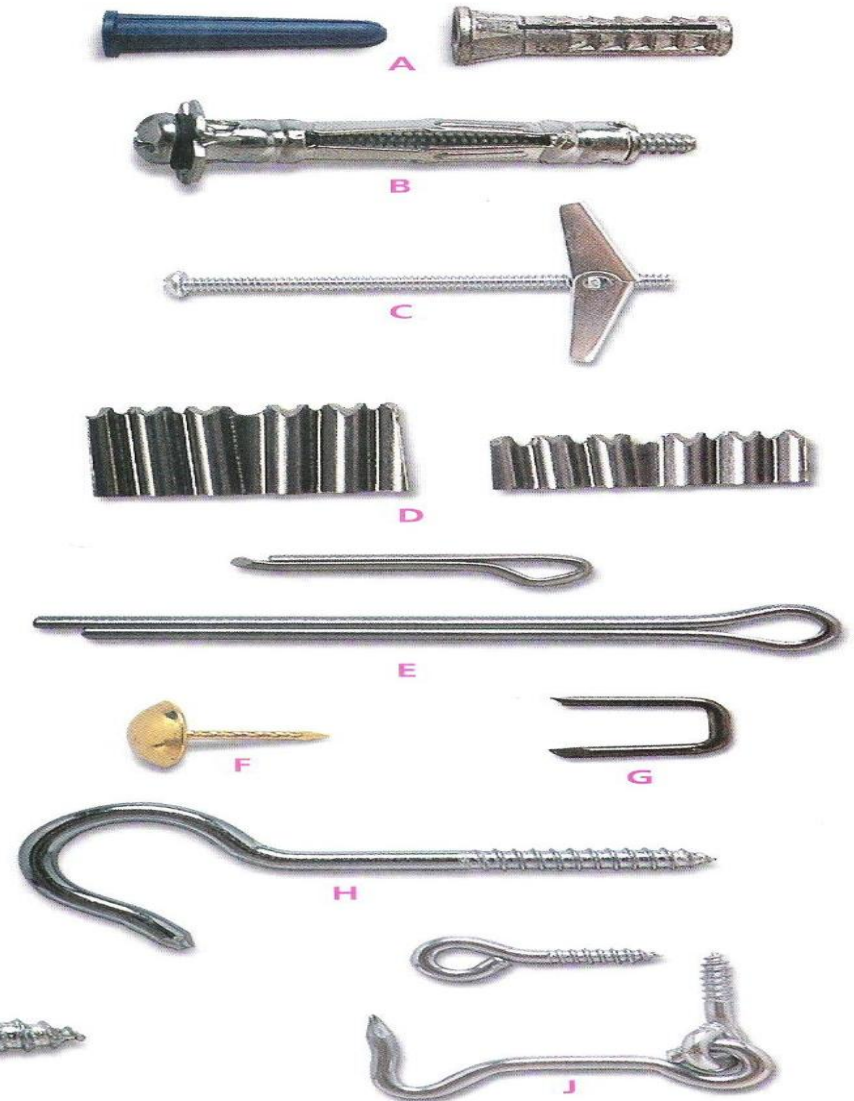
**Upholstery tack (F)**—tacks that come with many different kinds of decorative heads; used to hold upholstery in place.

**Staple (G)**—different sizes and forms are used to hold fabric on furniture, for holding wire in place, and for insulation.

**Screw hook (H)**—screws into wood; open end can support various items.

**screw eye (I)**—similar to a screw hook, except the hook is closed.

**Hook and eye (J)**—often used with a screw eye to fasten a door or a gate.





# Hand Tool Identification



**Nail set**—conceals the heads of finishing nails by driving them below the surface of the wood.

# Hand Tool Identification



**Nutdriver**—acts like a screwdriver but turns hexagonal nuts and bolts instead of screws.

# Hand Tool Identification

**Offset screwdriver**—used in hard-to-reach places where a normal screwdriver cannot be used; may be slotted or Phillips.



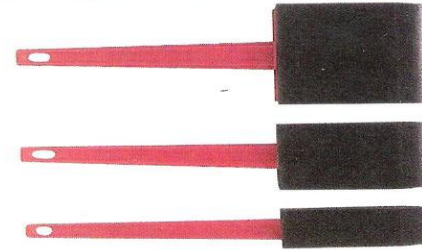
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# Hand Tool Identification

## Painting Tools

You can make even a so-so project look beautiful if you take the time to use the correct finishing tools and processes. Likewise, the most perfectly built project may be ruined if you do not finish it properly. Choose the appropriate tools to apply the finish to your project.



**Wand and sponge applicators**—mainly used for utility painting where a fine finish is not needed. The sponges are usually disposed of when the job is finished.



**Chisel-edge brush**—has angled bristles to paint a clean edge along trim.



**Wall brush**—used to cover a large area. Wall brushes are at least 4" wide.



**Trim brush**—comes in widths up to 2"; useful in areas where rollers cannot reach.

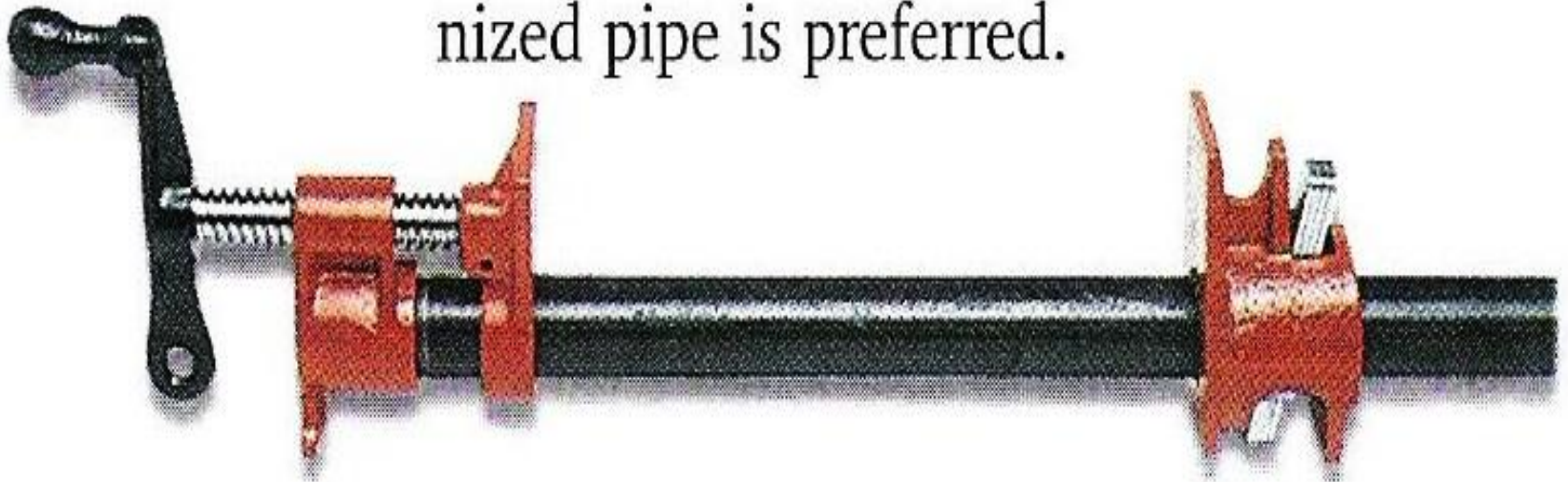


**Varnish brush**—has natural "split end" bristles that hold more varnish and other finishes.

# Hand Tool Identification

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**Pipe clamp**—fittings will fit any length of pipe. The sliding jaw operates with a spring-lock device. Black, nongalvanized pipe is preferred.

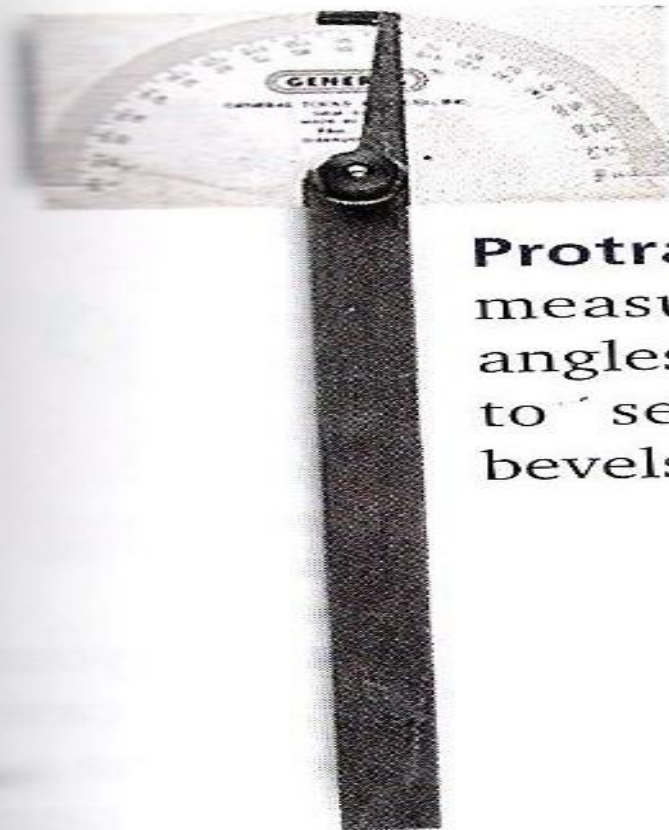


# Hand Tool Identification



**Plumb bob**—establishes a plumb (vertical) line.

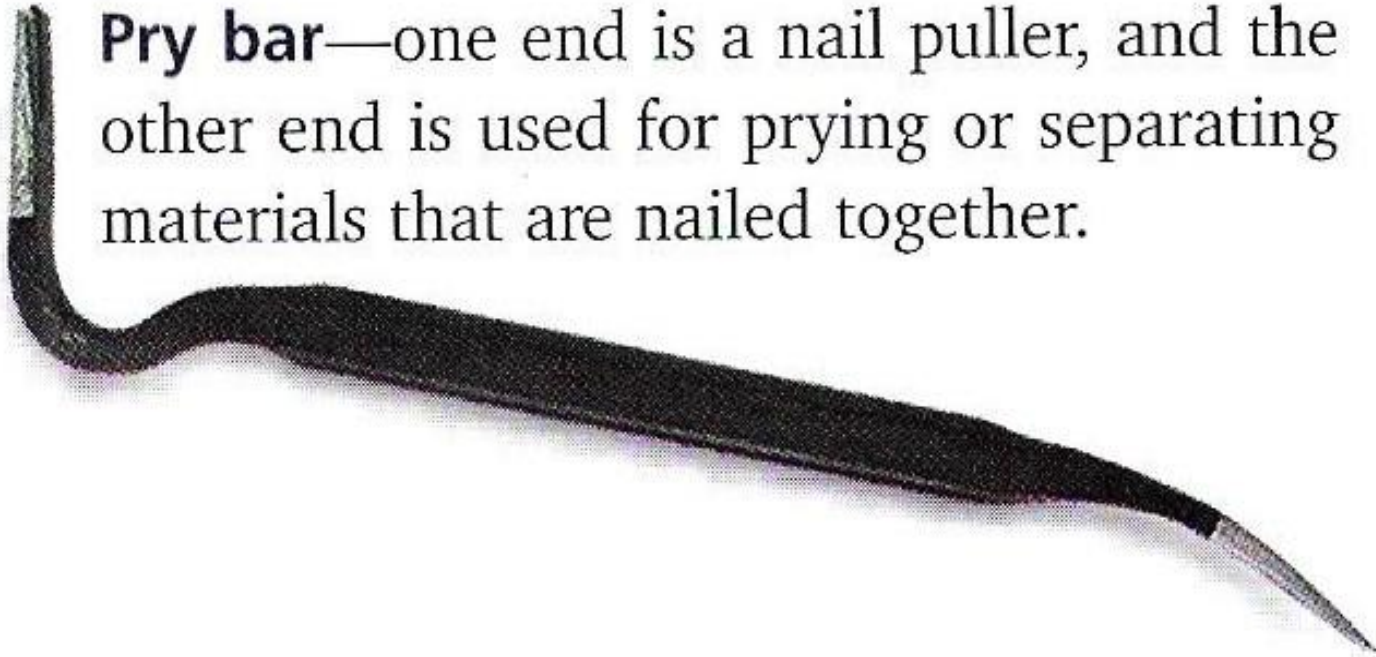
# Hand Tool Identification



**Protractor**—used to measure and mark angles. It is often used to set and transfer bevels accurately.

# Hand Tool Identification

**Pry bar**—one end is a nail puller, and the other end is used for prying or separating materials that are nailed together.





# Hand Tool Identification

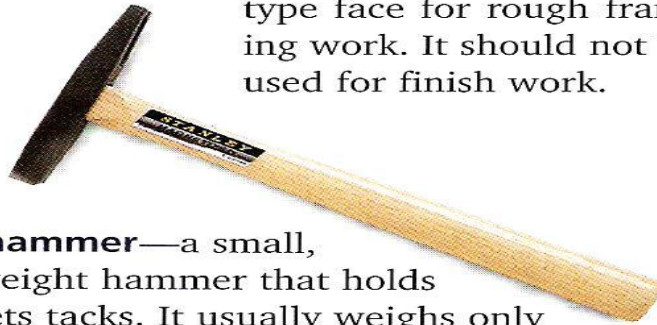
**Rafter angle square**—marked with degrees for fast layout. Its small size makes it handy for quick layouts.



# Hand Tool Identification



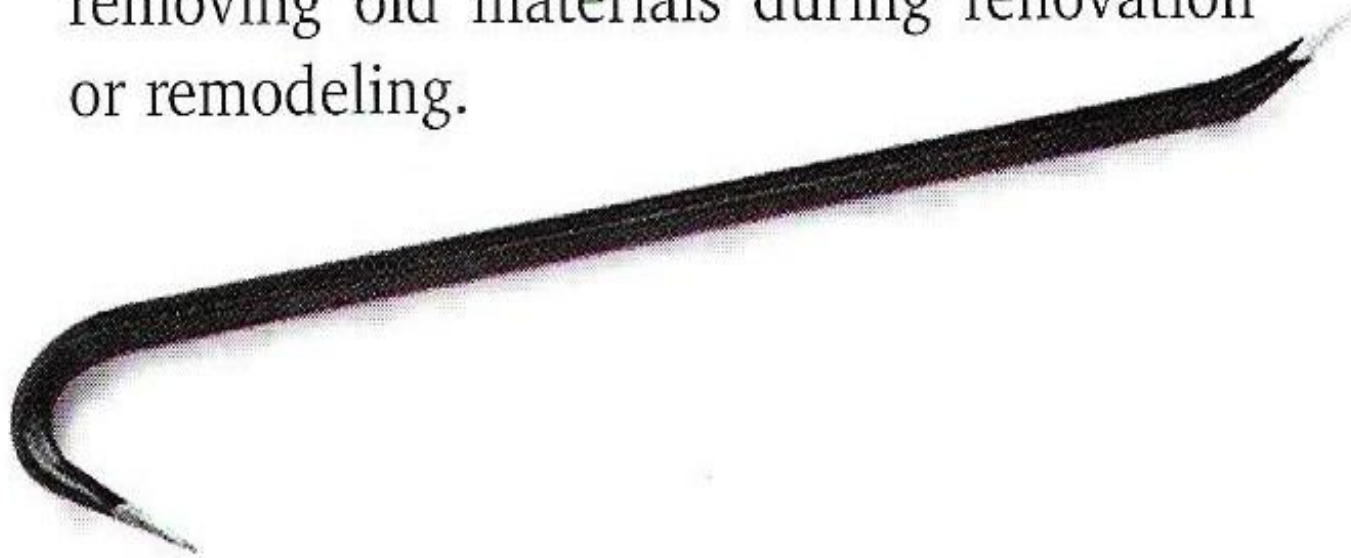
**Ripping hammer**—has a wedge-shaped claw used for prying apart pieces that have been nailed together. It has a mesh-type face for rough framing work. It should not be used for finish work.



**Tack hammer**—a small, lightweight hammer that holds and sets tacks. It usually weighs only 5 to 8 ounces. It is used for picture framing, cabinetmaking, trim, and upholstery.

# Hand Tool Identification

**Ripping bar**—for pulling large nails and removing old materials during renovation or remodeling.

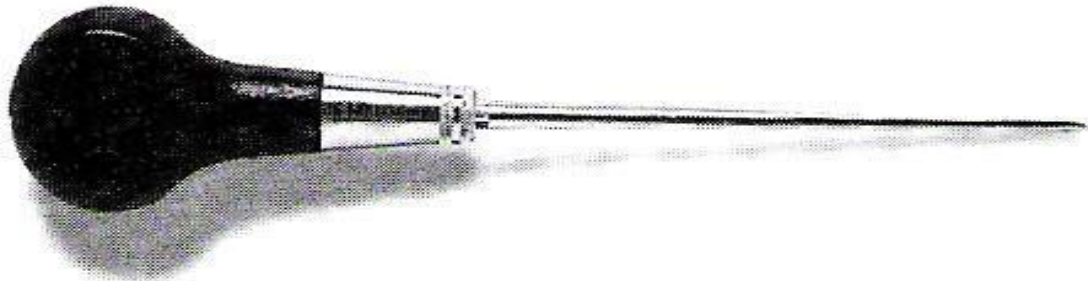


# Hand Tool Identification



**Rubber mallet**—used mainly for assembling projects.

# Hand Tool Identification



**Scratch awl**—used instead of a pencil to make fine layout lines, especially on metal. It can also be used to make small holes for starting drill bits, nails, or screws.

# Hand Tool Identification



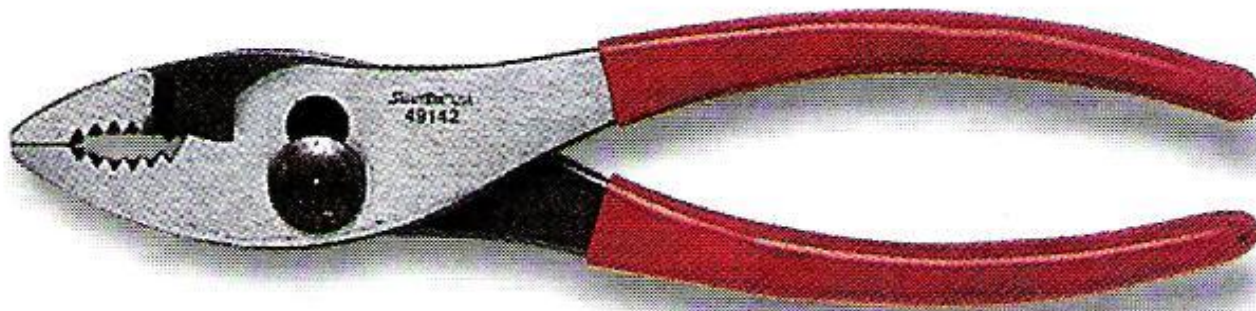
**Screwdriver set**—top and bottom left: Phillips-head and standard stubby screwdriver; middle: standard (slotted) screwdriver; right: Phillips-head screwdriver.

# Hand Tool Identification



**Sliding T-bevel**—for checking and transferring angles. The blade pivots and can be locked to match any angle.

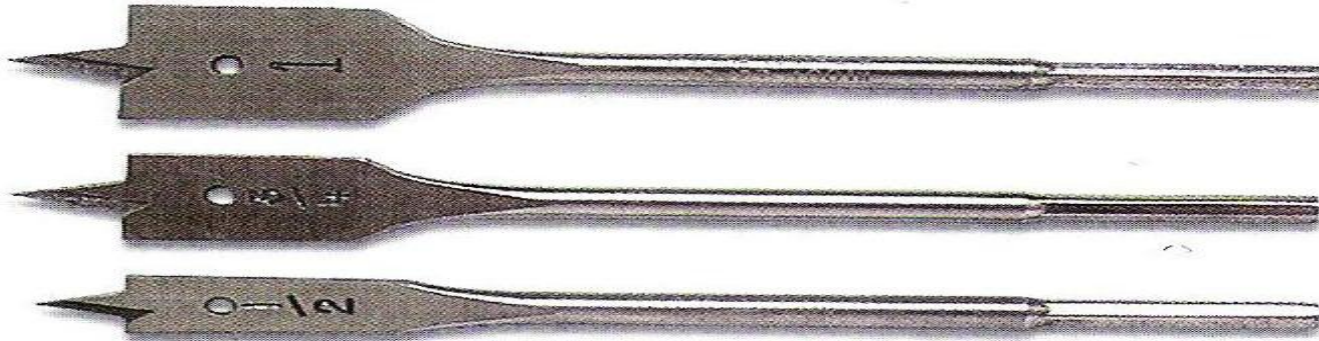
# Hand Tool Identification



**Slip-joint pliers**—have small and large teeth to grip objects. The jaw size can be expanded by slipping the pivot into different positions.



# Hand Tool Identification



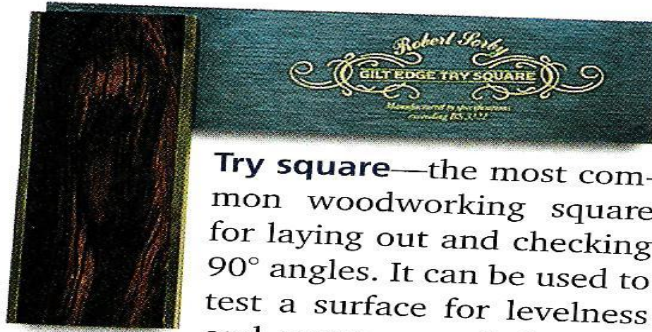
**Spade bit**—the long point makes it easy to locate the hole exactly where you want it. Start the drill at a slow speed as it enters the wood. If you are not careful, it will leave a splintered exit hole.

# Hand Tool Identification

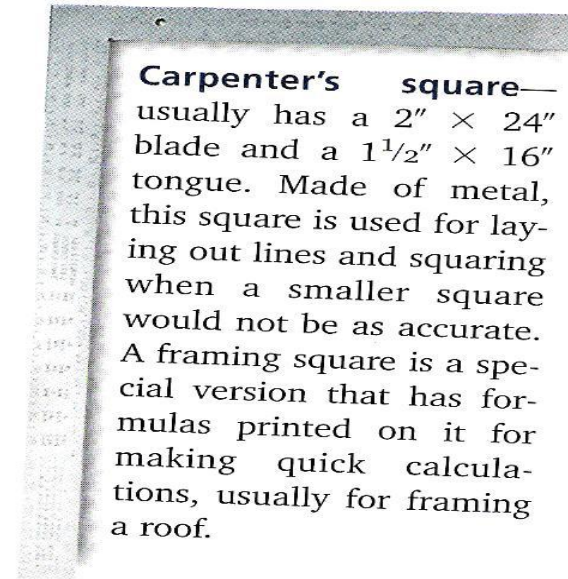


**Spring clamp**—used for quick, light pressure; a protective covering prevents it from scratching the surface.

# Hand Tool Identification



**Try square**—the most common woodworking square for laying out and checking 90° angles. It can be used to test a surface for levelness and squareness. It is often used to make lines across the face or edge of stock.



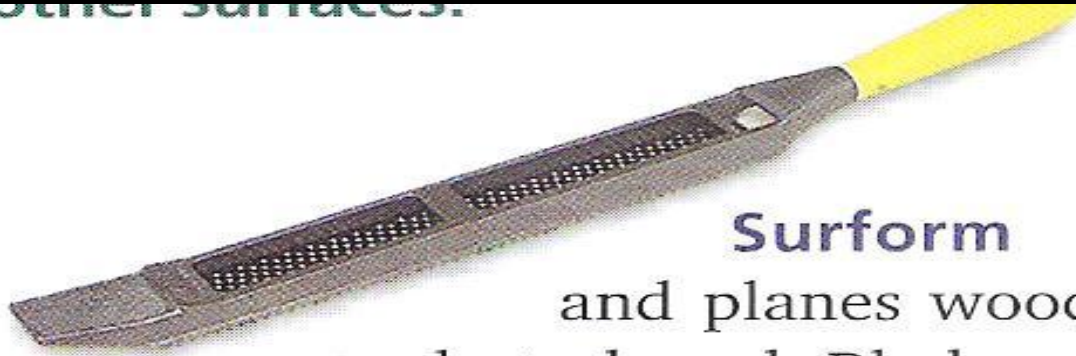
**Carpenter's square**—usually has a 2" × 24" blade and a 1½" × 16" tongue. Made of metal, this square is used for laying out lines and squaring when a smaller square would not be as accurate. A framing square is a special version that has formulas printed on it for making quick calculations, usually for framing a roof.



**Combination square**—used to check and lay out 90° and 45° angles. The handle slides on the blade so that it can be used as a depth gauge. A spirit level in the handle can be used to check level and plumb.

# Hand Tool Identification

Other surfaces:



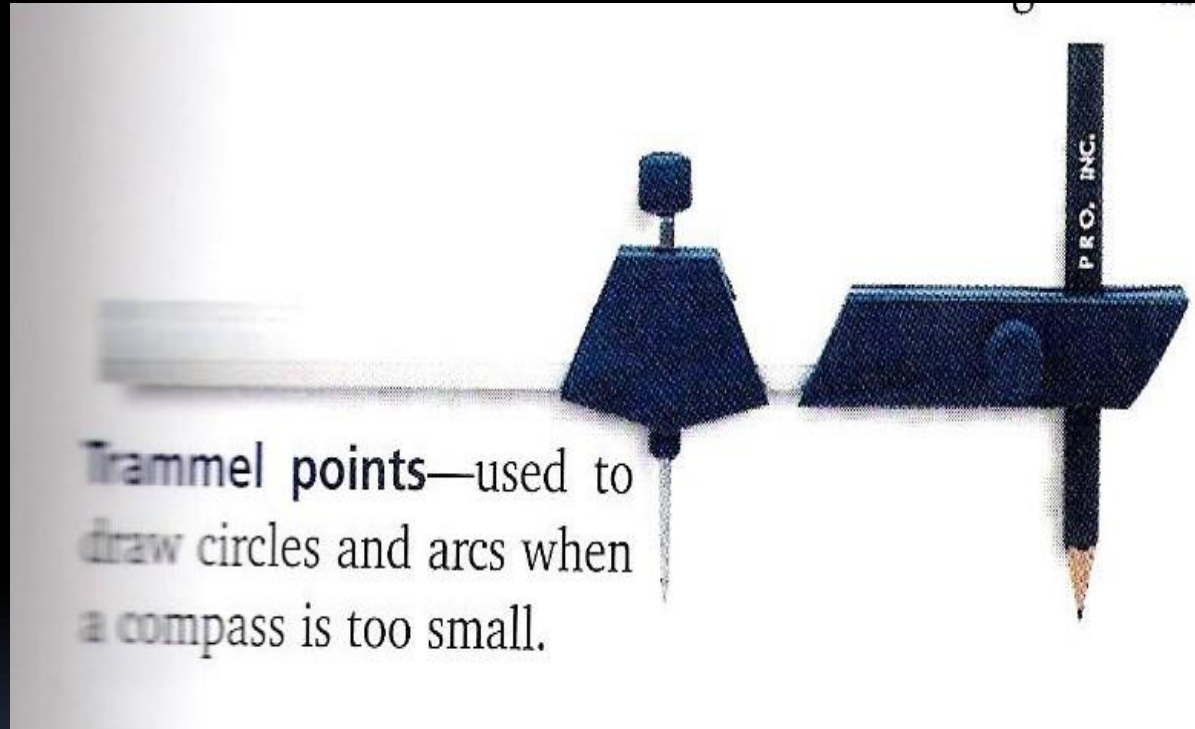
**Surform plane**—shapes and planes wood, plywood, and plasterboard. Blades are replaced, not sharpened, when they become dull.

# Hand Tool Identification

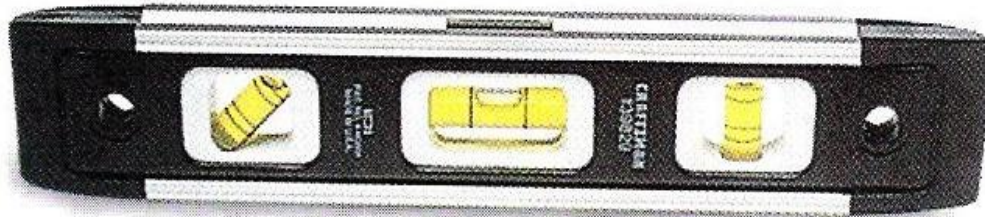


**Tape measure**—a flexible tape that slides into a case. The tape has a hook on the end that adjusts to true zero.

# Hand Tool Identification



# Hand Tool Identification



**Torpedo level**—preferred by plumbers. It is shorter than other levels and can be used in small areas.

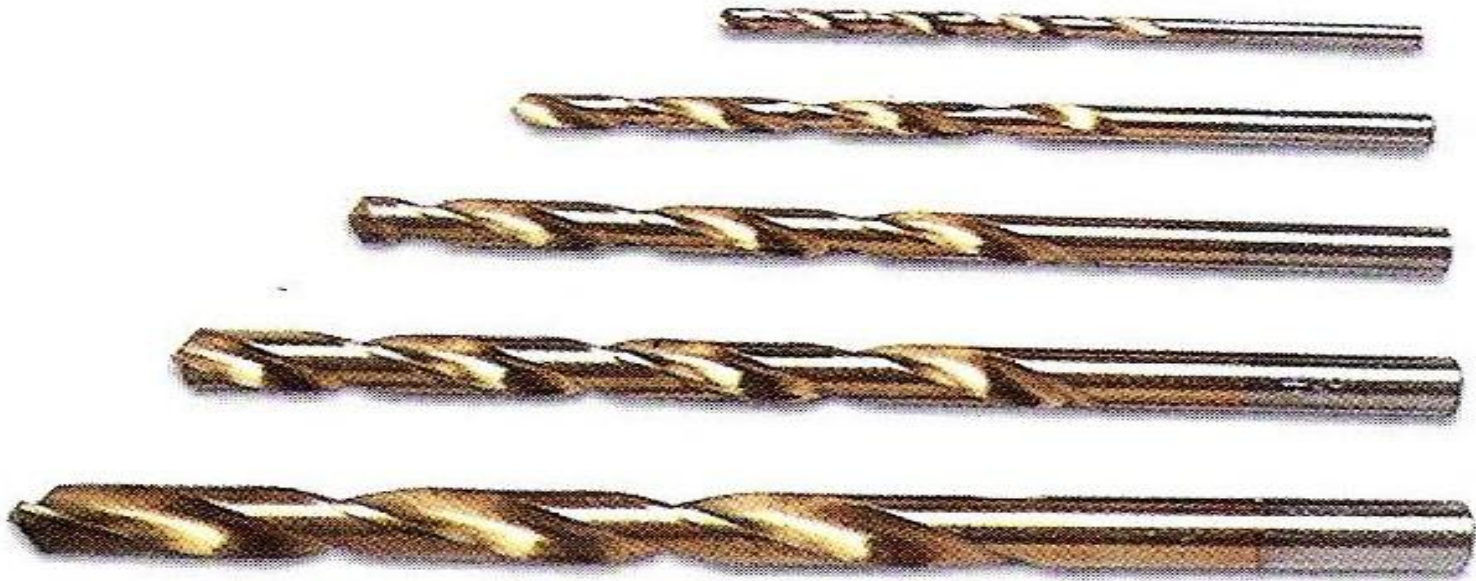
# Hand Tool Identification

**Trigger clamp**—all-purpose clamp with built-in anti-marring pad; requires only one hand to operate.





# Hand Tool Identification



**Twist bit**—designed for wood. If you use it with metal, lubricate it with machine oil.

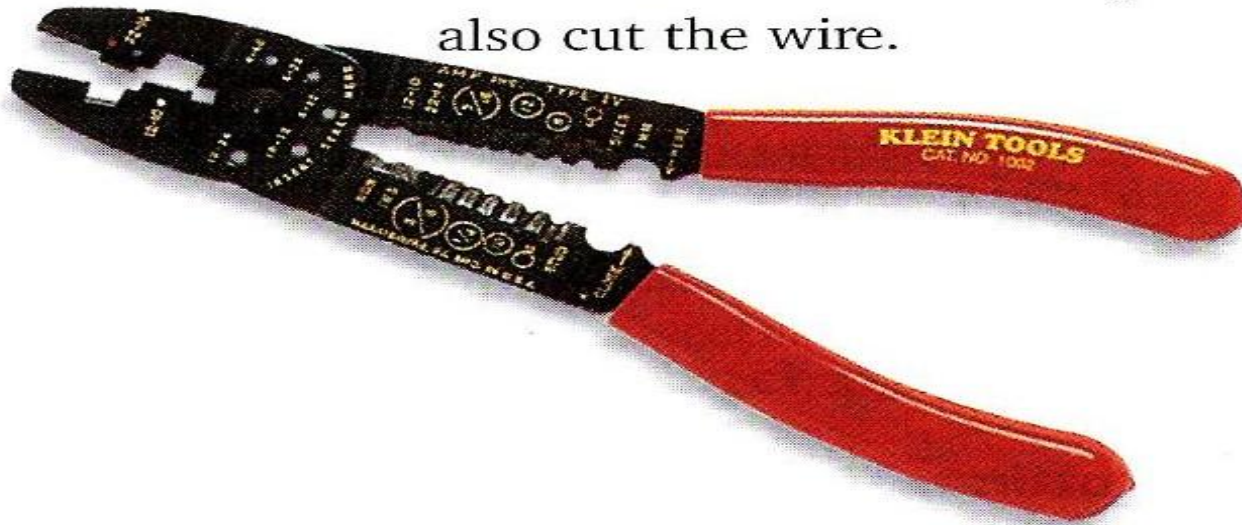
# Hand Tool Identification



**Straight-jaw locking pliers**—clamp firmly to an object. The jaws can be adjusted to clamp to objects of different sizes.

# Hand Tool Identification

**Wire stripper and cutter—** designed to strip off the insulation on electrical wire; can also cut the wire.



# Hand Tool Identification



**Woodworker's bench vise**—mounts on the underside of a workbench. Wood inserts are usually used on the jaws to protect the wood held in the vise.



# Hand Tool Identification

- End of Tool Identification
  - Complete quiz and turn in.
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