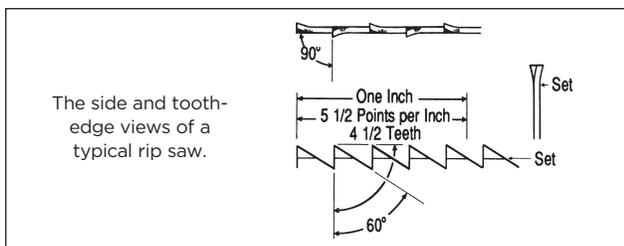
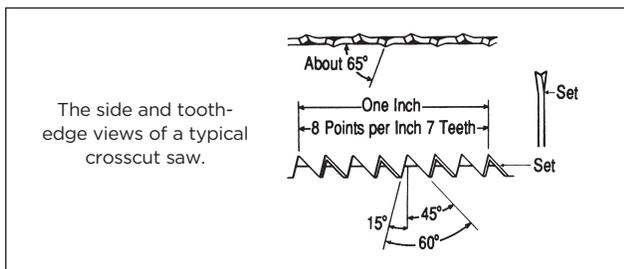


### 36 HAND TOOLS

Injuries with hand tools are not often serious but they do involve lost time. Common causes include using the wrong tool, using the right tool improperly, haste, and lack of training or experience.

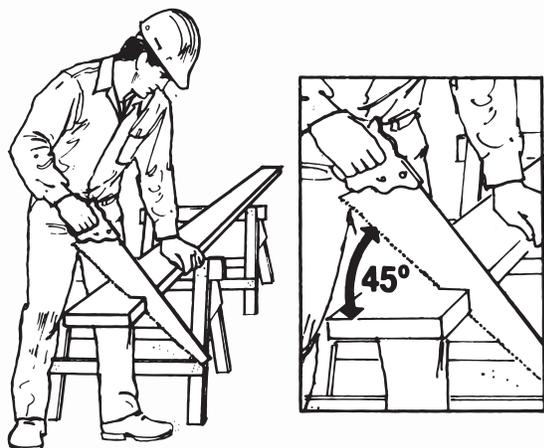
#### Hand Saws

Select the right hand saw for the job—either a crosscut saw or a rip saw. A **crosscut saw** should be used when cutting across the grain of the wood. A **rip saw** is best for cutting with the grain. The illustrations below show the differences in teeth between rip and crosscut saws.



A 9-point hand saw is best for cutting softwood. For crosscutting hardwood, the best choice is an 11-point saw.

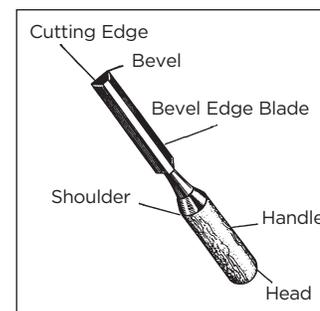
When starting a cut, keep your thumb up high to guide the saw and avoid injury. Once you start crosscutting, maintain an angle of 45 degrees between the saw and wood (see illustration below). When using a rip saw, the best angle is 60 degrees.



**Best Method for Crosscutting**

#### Wood Chisels

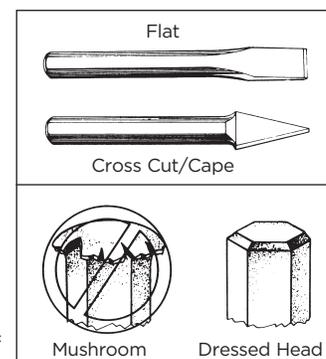
Most injuries with this tool can be prevented by keeping the hand that holds the work **behind**, not in front of, the chisel. In addition, follow the safe work practices listed below:



- Keep the tool sharp. A dull or incorrectly sharpened chisel is difficult to control and tedious to work with.
- Chisels not in use or stored in a toolbox should have protective caps.
- Wood chisels are tempered to be very hard. The metal is brittle and will shatter easily against hard surfaces.
- Never use a chisel for prying.
- Repeatedly striking the chisel with the palm of your hand may lead to a musculoskeletal disorder.
- With chisels and other striking tools, **always wear eye protection**. Gloves are recommended to help prevent cuts and bruises.

#### Cold Chisels

Cold chisels are used to cut or shape soft metals as well as concrete and brick. They come in a variety of different shapes such as flat, cross cut (or cape), half round, and diamond point.

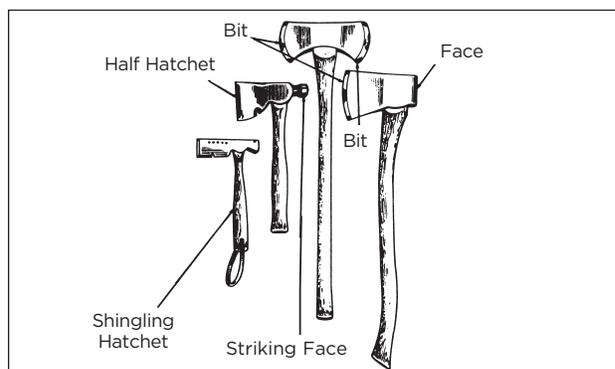


In time, the struck end of a chisel will mushroom.

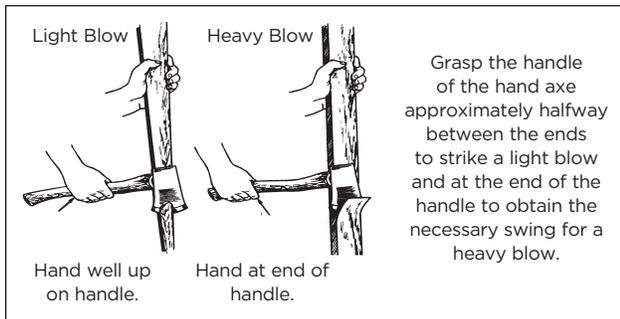
This can cause striking tools to slip off the end. Also, fragments can fly off and the sharp edges can cause injury. ALWAYS wear eye protection. Grind off mushroomed heads and keep the struck end properly dressed. The top should be flat and the sides chamfered (i.e., cut at a 45° angle).

#### Axes and Hatchets

In construction, axes are mainly used for making stakes or wedges and splitting or shaping rough timbers.



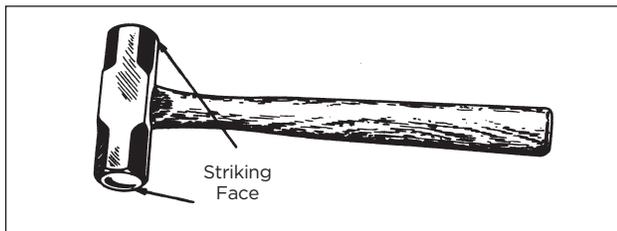
- Unless it has a striking face, don't use the hatchet as a hammer. The head or the wooden handle can crack and break.
- Hatchets with striking faces are meant only for driving common nails, not for striking chisels, punches, drills, or other hardened metal tools.
- Never use an axe or hatchet as a wedge or chisel and strike it with a hammer.
- Most carpenters prefer a hatchet with a solid or tubular steel handle and a hammer head with a slot for pulling nails.



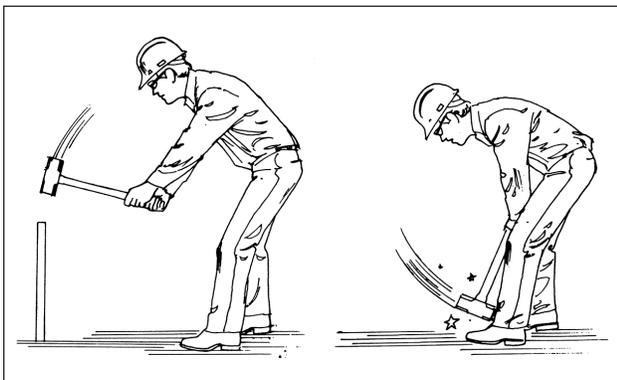
## Sledgehammers

Sledgehammers are useful for drifting heavy timbers and installing and dismantling formwork. They can knock heavy panels into place and drive stakes in the ground for bracing.

Sledgehammers can also be used to drive thick tongue-and-groove planking tightly together. Use a block of scrap wood to prevent damage to the planks.

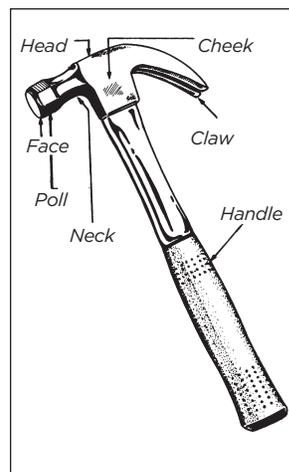


The main hazard is the weight of the head. Once the hammer is in motion it's almost impossible to stop the swing. Serious bruises and broken bones have been caused by sledgehammers off-target and out of control (see illustration below).



- Missing the target with the head and hitting the handle instead can weaken or break the stem of the handle. Another swing can send the head flying.
- Always check the handle and head. Make sure the head is secure and tight. Replace damaged handles.
- As with any striking or struck tool, always wear eye protection.
- Swinging a sledgehammer is hard work. Avoid working to the point of fatigue. Make sure you have the strength to maintain aim and control. Those who are not used to working with a sledgehammer should take regular rest breaks until they build up their physical stamina.

## Claw Hammers



Claw hammers are available in many shapes, weights, and sizes for various purposes. Handles can be wooden or steel (solid or tubular). Metal handles are usually covered with a shock-absorbing material that provides a more comfortable grip.

Start with a good quality hammer of medium weight (16 ounces) with a grip suited to the size of your hand.

Rest your arm occasionally to avoid tendinitis. Avoid overexertion in pulling out nails. Use a crow bar or nail puller when necessary.

When nailing, start with one "soft" hit, that is, with fingers holding the nail. Then let go and drive the nail in the rest of the way.

Strike with the hammer face at right angles to the nailhead. Glancing blows can lead to flying nails. Clean the face on sandpaper to remove glue and gum.

Don't use hammers on concrete, steel chisels, hardened steel-cut nails, or masonry nails.

Discard any hammer with a dented, chipped, or mushroomed striking face or with claws broken, deformed, or nicked inside the nail slot.

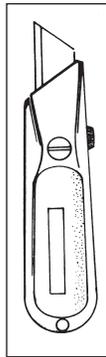
**Caution:** Repeated use of a hammer may lead to musculoskeletal injury (e.g., tendinitis), strain, or carpal tunnel syndrome. Exercising to warm up, as well as to develop and maintain overall muscle condition, may help to reduce the risk of strain or injury.

**Utility Knives**

Utility knives cause more cuts than any other sharp-edged cutting tool in construction.

Use knives with retractable blades only.

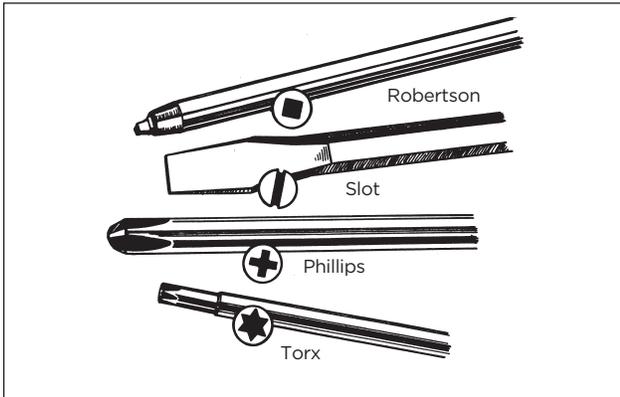
Always cut away from your body, especially away from your free hand. When you're done with the knife, retract the blade at once. A blade left exposed is dangerous, especially in a toolbox.



**Screwdrivers**

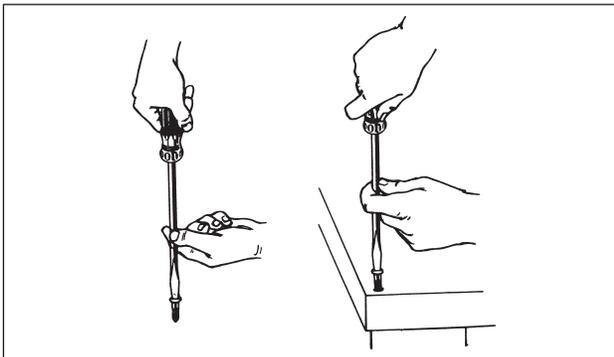
More than any other tool, the screwdriver is used for jobs it was never meant to do. Screwdrivers are not intended for prying, scraping, chiselling, scoring, or punching holes.

The most common abuse of the screwdriver is using one that doesn't fit or match the fastener. (i.e., using a screwdriver too big or too small for the screw or not matched to the screw head).



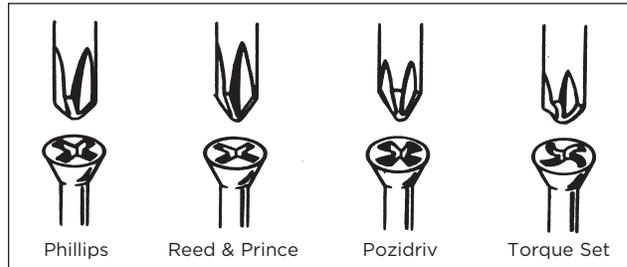
The results are cuts and punctures from slipping screwdrivers, eye injuries from flying fragments of pried or struck screwdrivers, and damaged work.

As best practice, make a pilot hole before driving in a screw. Start with one or two "soft" turns, that is, with the fingers of your free hand on the screw. Engage one or two threads, make sure the screw is going in straight, then take your fingers away.



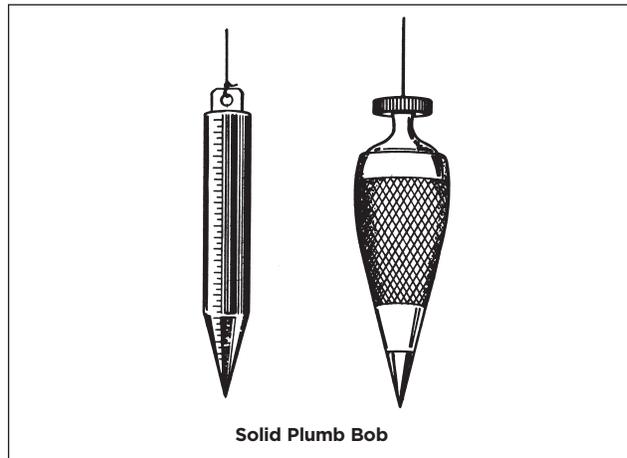
You can put your fingers on the shank to help guide and hold the screwdriver. But the main action is on the handle, which should be large enough to allow enough grip and torque to drive the screw. Power drivers present obvious advantages when screws must be frequently or repeatedly driven.

**Note:** All crosspoint screws are not designed to be driven by a Phillips screwdriver. Phillips screws and drivers are only one type among several crosspoint systems. They are **not** interchangeable.



**Plumb Bobs**

The weight of a mercury-filled plumb bob will surprise you. Designed for use in windy conditions, the bob has considerable weight in proportion to its surface area.



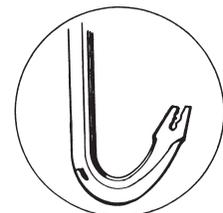
The weight and point of the bob can make it dangerous. Ensure that all is clear below when you lower the bob.

Store it securely so that it doesn't fall out of your pocket, apron, or tool bag. The same goes for the standard solid bob.

**Crow Bars**

Any steel bar 25-150 cm long and sharpened at one end is often called a crow bar.

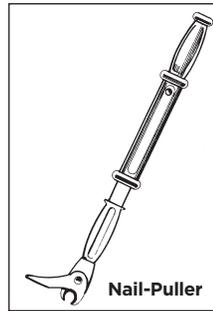
The tools include pry bars, pinch bars, and wrecking bars. Shorter ones usually have a curved claw for pulling nails and a sharp, angled end for prying.



## Nail Pulling

Pulling out nails can be easier with a crow bar than a claw hammer.

In some cases, a nail-puller does the job best. Keep the hand holding the claw well away from the striking handle.



## Lifting

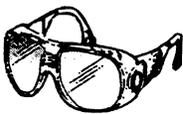
Loads levered, lifted, or shifted by bars can land on fingers and toes.

- Make sure to clear the area and maintain control of the load.
- Have enough rollers and blocking ready.
- Never—not even for a split second—put fingers or toes under the load.
- Try to avoid prying, pulling, wedging, or lifting at sharp angles or overhead.
- Wherever possible, keep the bar at right angles to the work.
- Wear eye protection and, where necessary, face protection as required under CAN/CSA Z94.3-15: *Eye and Face Protectors* (see illustrations below).

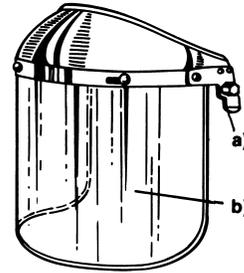
### Examples of Class 1 - Spectacles



Class 1A  
Spectacles with side protection



Class 1B  
Spectacles with side and radiation protection

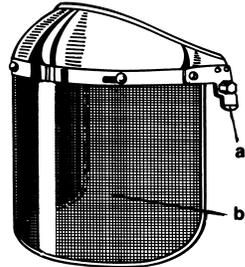


### Class 6A

Face shield for impact, piercing, splash, head, and glare protection. a) hard hat attachment; b) face shield (window).

### Class 6B

Face shield for light non-piercing impact, splash, low heat, and glare protection. The major difference between 6A and 6B is the degree of thickness in the shield.



### Class 6C

Face shield for light non-piercing impact and high heat protection only (usually wire screen windows). a) hard hat attachment; b) wire screen.