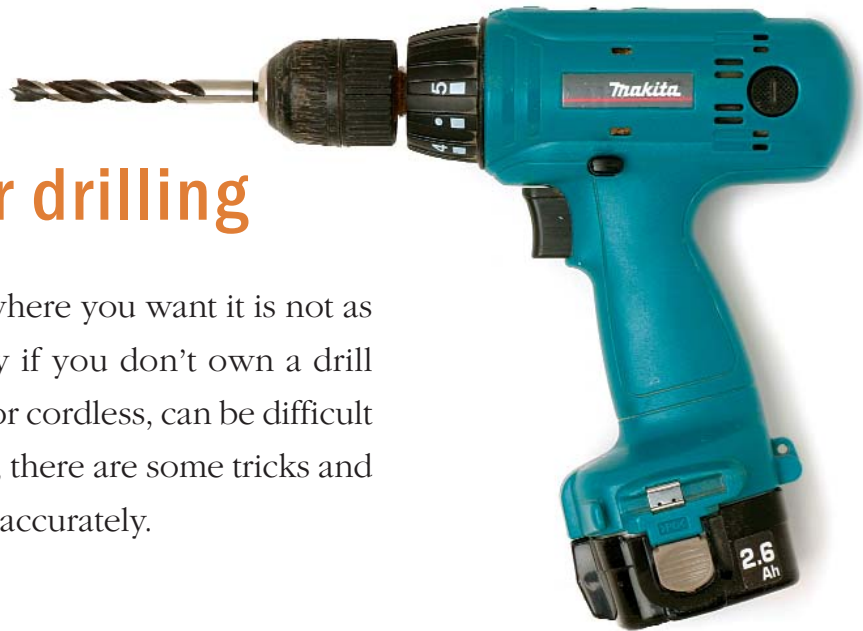


Best practices for drilling

Sinking a hole straight and exactly where you want it is not as easy as you would think, especially if you don't own a drill press. A handheld drill, be it corded or cordless, can be difficult to control. As with all shop practices, there are some tricks and tools that can help you to drill holes accurately.



FIND THE CENTER TO DRILL ON TARGET

Layout is the first step in drilling a hole. To determine the precise location of a hole, draw or scribe cross lines. Then use a center punch to make a 90° dimple in the wood at the intersection of the lines. The dimple will prevent the bit from wandering when you start drilling.

Another way to drill in an exact location is to use a self-centering bit. These bits most commonly are used to drill holes when installing hardware that needs flat-head screws, such as hinges. The bit is housed inside a metal casing, which has a tapered end. To use it, fit the tapered end of the housing into the hole on a piece of hardware. The tapered end automatically centers itself in the hole. As you apply pressure to the bit and begin drilling, the housing retracts and exposes the bit, allowing it to drill centered into the workpiece.



Before drilling, mark and center-punch. The dimple punched into the workpiece will guide the bit.



Self-centering bits help when installing hardware. Drilling for hinge screws requires precision. Self-centering bits have a tapered end on the metal housing, which centers the bit in the hinge's machined hole.

BACK UP THE WORKPIECE TO PREVENT TEAROUT

The best way to prevent tearout when drilling through-holes is to place a sacrificial backer board underneath the workpiece to support the wood fibers where the bit exits (photo below).

When using a bit with a brad-point tip, you can prevent tearout by drilling until the point just peeks through the back side of the workpiece. Then turn over the work and use the resulting pinhole as the center point to finish drilling.

A power drill with a variable-speed motor can be especially useful when it comes to drilling without tearout. Drill slowly

at first, and increase the speed as the bit finds center and starts to bite in.



Position a sacrificial board underneath the workpiece. When wood fibers are supported, they don't tear as the bit exits the workpiece.

CLEAR THE CHIPS OFTEN

If the flutes of a bit get clogged with wood chips, they can cause the bit to burn or wander, to create oversize holes, or even to get jammed completely in the workpiece. It is important to withdraw the bit from the work periodically to clear the chips. This also is a matter of safety, as impacted bits are more prone to spin the work or the drill motor in the hands of the operator.

SQUARE THE BIT FOR PERPENDICULAR HOLES

If your shop lacks a drill press, it can be a challenge to drill a perpendicular hole in a workpiece. Some power drills have embedded bubble levels on them that can be used to help align a bit. If your drill doesn't, one simple trick is to place two squares on the workpiece next to the area where a hole is to be sunk. Use the squares to sight your bit (photo, near right). If it is parallel with the squares when looking from all sides, the bit should drill perpendicularly into the workpiece. Continue sighting the bit until the hole is complete.

When you want to be more precise than is possible by sighting a bit, there are several commercial jigs that can be used to keep a bit square to a workpiece. Many of these jigs convert a handheld drill into a miniature drill press (photo, far right).



You don't need a drill press to make straight holes. Sight the bit against two squares to ensure that the hole is drilled perpendicular to the workpiece (left). Or you can use an accessory, like this drill guide from General (above), which turns the handheld drill into a mini drill press.

USE A SHOPMADE JIG FOR ANGLED HOLES

For drilling angled holes, I like to use a shopmade jig that consists of a block of wood with a hole drilled through its center. The end of the wood block that makes contact with the workpiece is crosscut at an angle so that it can rest on the workpiece in the correct position. Glue two support blocks to the sides of the jig to create a larger base. Finally, mark the bottom of the jig with lines that intersect at the center of the hole. Continue the lines around the sides of the jig so that they will be visible when drilling.

To use the jig, line up the cross lines on the jig with the cross lines that mark the location of the hole on the workpiece. If your lines are accurate, the hole in the jig should line up dead center with the desired location of the hole on your workpiece. Hold the jig steady with your hand or with clamps, and drill through the jig and into the workpiece.

Make a jig for drilling at an angle. A block of wood cut at an angle helps guide the bit into the workpiece at a consistent angle.



DRILL IN THE RIGHT ORDER

When countersinking for bolts or screws, you often need to drill stepped holes. In most cases, you must drill the biggest-diameter hole first and then follow that up with the smaller-diameter hole. The smaller bit can be centered in the larger hole using the dimple created by the tip of the larger bit as a center point. Common twist bits are the exception. They can be used in the opposite sequence; large twist bits will self-center in a hole drilled with a smaller bit.

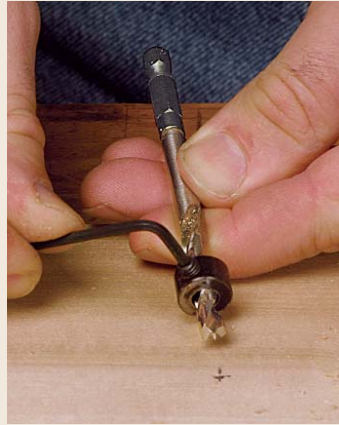


Lag bolts require stepped holes. When using brad-point bits, drill the larger hole before the smaller one.

Rules of Thumb (continued)

USE A STOP TO CONTROL DEPTH

Sometimes it is necessary to control the depth of a drilled hole. A variety of drill stops can help you do this. For example, you can buy a locking collar that fits over the drill bit. Once the bit cuts into the wood to the desired depth, the collar prevents it from going any deeper.



A wood block also can be used as a drill stop. Drill a hole in a small block of wood so that the bit is completely buried in the block. Then cut the scrap to length so that the bit protrudes from the block equal to the desired depth of the hole. When you drill into a workpiece, the block will stop the bit from going in any deeper than you intend.

In many situations I have found that wrapping a piece of masking or duct tape around the bit at the desired depth works fine. However, the tape will become unreliable after drilling five to 10 holes.



Three ways to control hole depth. A commercially available collar (above left) is one type of depth stop. A block of wood cut to a precise length and fitted over a drill bit (above) will prevent overdrilling. A piece of duct tape (right) also can be used; stop drilling when the tape brushes away the chips.

