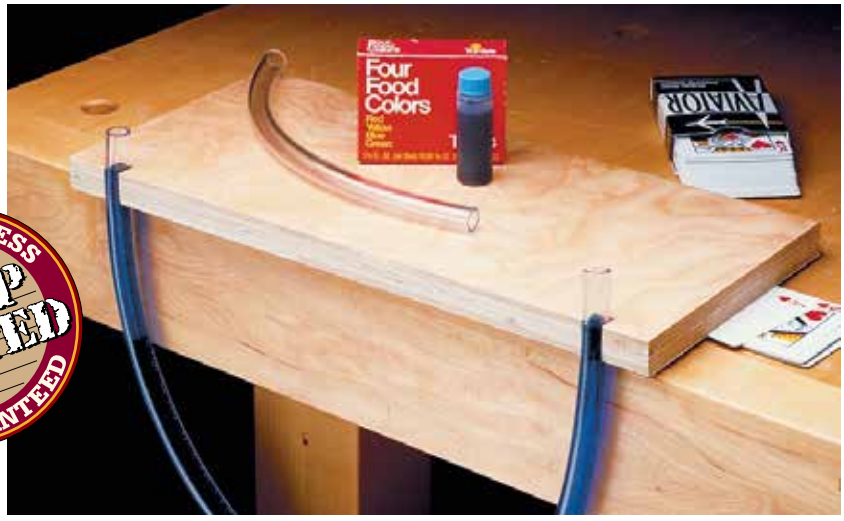
Woodsmith PLANS

10+ LAYOUT & MEASURING TIPS



TOTAL SUCCESS SHOP TESTED GUARANTEED

Your #1 layout tool

Pencils

You might not think of a pencil as a "shop tool." But whether it's tucked behind an ear or slipped into a pocket, I always have a pencil at the ready anytime I'm working in the shop. In fact, a pencil is the one tool I use on every project. And since they're such a shop staple, it's my opinion that pencils really deserve a closer look.

Quality – A standard wood pencil is such a common household item that few of us probably give it much thought. But like any other tool we use on a daily basis, there are big differences in quality among pencils. If you've ever used a cheap pencil you know what I'm talking about. In fact, you may be surprised to know that the "wood" is actually compressed sawdust and the pencil lead is hard and gritty.

By contrast, better pencils are still made from incense cedar (which produces the pleasant, distinctive aroma when the pencil is sharpened). And the pencil lead (actually graphite — there is no lead in pencils) is carefully manufactured and graded. General, Dixon Ticonderoga, and Musgrave are a few of the U. S. manufacturers still making quality pencils.

Pencil Grades – Selecting a pencil also involves making a decision on the hardness of the pencil lead. Everyday writing pencils are usually graded on a four-point grading system, with No. 1 being the softest and No. 4 being the hardest. (No. 2 is the most common.) But pencils that are sold for drafting are available in up to twenty different grades, ranging from a 9H (hardest) to a 9B (softest). You can find drafting pencils at most art supply and craft stores.

Shop Tips: The Write Stuff

▲ **White Pencil.** *I use a white, colored pencil for marking dark woods (like walnut) where an ordinary pencil line won't show up.*

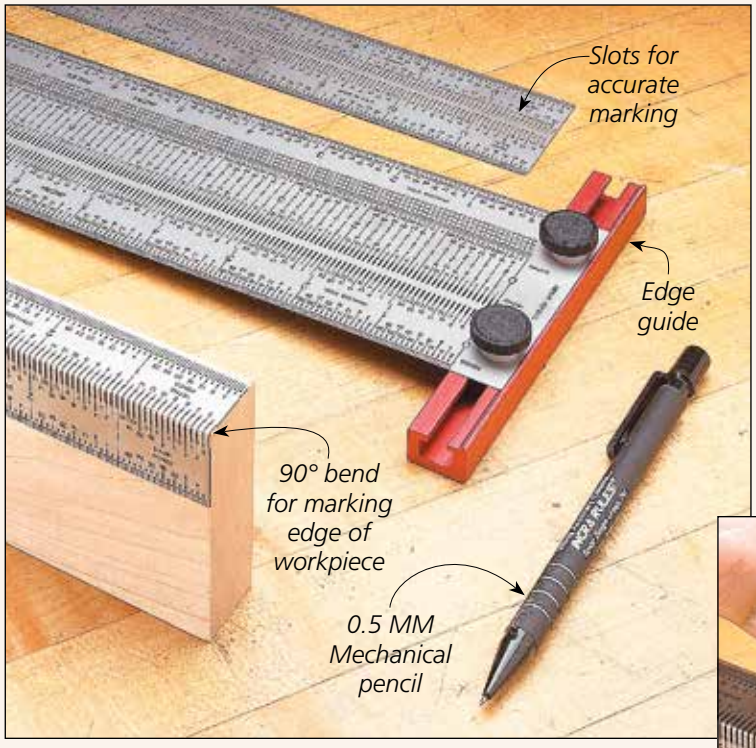
▲ **Eraser.** *Just as important as a pencil is a good-quality drafting eraser. I keep one in my shop apron for erasing layout lines.*

▲ **Clip-On Sharpener.** *This pencil sharpener clips onto your belt so it's always within reach, allowing you to keep your pencil sharp.*

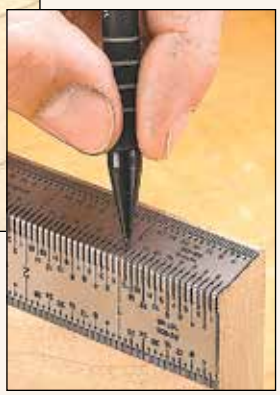
In the drafting pencil grading system, the letter H stands for hard and the letter B stands for black. The numbers indicate the relative hardness or blackness of the graphite. So a 7H is harder than a 2H and a 9B is softer (and blacker) than a 3B. In the middle of the scale are two intermediate grades — HB (hard and black) and F (fine or firm) — that roughly correspond to a No. 2 and a No. 1½ pencil.

Most of the time, I stick with an HB or even a 2B. The leads of these pencils leave a dark line without having to bear down on the pencil. But I also like to keep a pencil with a harder lead (like a 2H) around in the shop. The harder lead doesn't wear down as fast and leaves a lighter mark I can erase easily.

Mechanical Advantage – Of course, wood pencils aren't the only choice you have. I know several woodworkers who prefer to use mechanical pencils. These pencils typically have a very thin lead. (A common lead diameter is 0.5 mm.) This gives mechanical pencils the advantage of being able to draw a consistent-width line, even as the lead wears away. This makes them a great choice for precise layout work. In fact, there are even some special layout tools for use with mechanical pencils (see photos above and at right).



◄ *These stainless steel rules have rows of precisely positioned slots and holes that are sized for the lead of an 0.5 mm mechanical pencil.*



▲ *Used with a mechanical pencil, the slots in this rule make precise layout automatic.*

Another advantage of mechanical pencils is that they don't need sharpening. You simply advance the lead as it wears down. Inexpensive replacement leads are available once the original lead is used up. And like standard pencils, you can buy replacement leads in several different grades.

Carpenter's Pencil – There's one other type of pencil that I still keep around in the shop and that's a traditional, carpenter's pencil. Although I don't use it much for layout work, it's a good choice for less exacting tasks, like marking lumber for framing projects.

Carpenter's pencils have a wide, rectangular-shaped lead. So they make a heavy line that's easy to see. But if you sharpen the pencil to a chisel-like point (see box below), you can also use it to draw a fine line. And like other pencils, you can buy carpenter's pencils with soft, medium, or hard lead.

Finally, for some tips on a few other pencils and pencil accessories that I like to use, see the box on the previous page.

To the Point: Carpenter's Pencil

A properly sharpened carpenter's pencil should have a chisel-like tip on the end (see main photo at right). In the past, a utility knife was the only way to do this. But there are now sharpeners that make sharpening a carpenter's pencil a breeze.

Opposing Blades. These special sharpeners have two pairs of opposing blades. First, you insert the pencil in one end of the sharpener and move it back and forth over the blades to sharpen the faces of the pencil. Then you simply turn the sharpener over and insert the pencil in the other end to sharpen the sides (see inset photos).

Secrets of the Story Stick

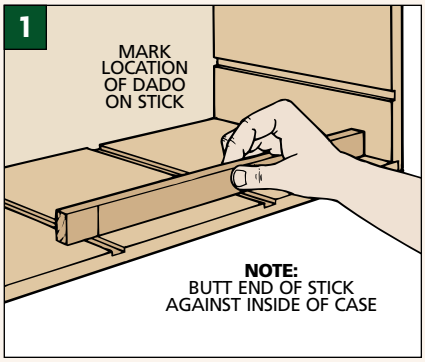
When laying out matching dadoes, I like to use a story stick. It's simply a piece of scrap that I use like a ruler, but it only has marks on it where the dadoes need to be cut.

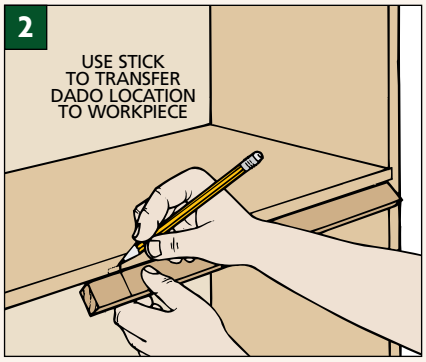
Advantages – The real advantage of a story stick is you don't have to measure anything. (It's easy to make a mistake when using measurements and adding them up.)

With a story stick it's just a matter of marking the locations of the dadoes on the stick and then transferring the locations to the matching piece.

Using the Story Stick – To use a story stick for jobs like transferring dadoes, start by butting one end of the stick against the inside of the case and marking the exact locations of the dadoes (Fig. 1).

Then with the same end of the stick against the case, move the stick to where the dadoes need to be cut and transfer the marks (Fig. 2).



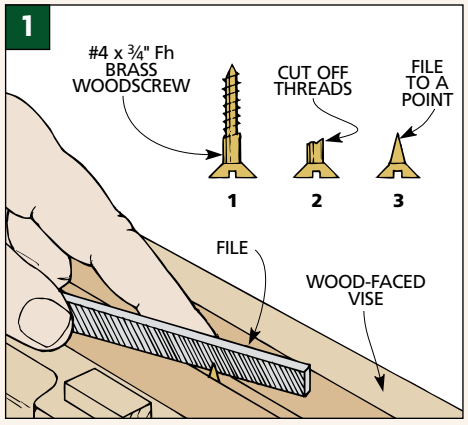


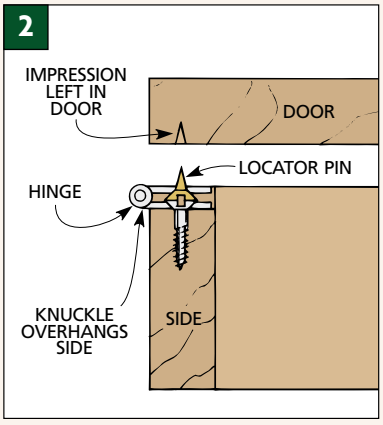
"Tip" for Locating Hinge Screws

It's easy mounting hinges for overlay doors to a cabinet. But trying to mark the matching screw locations in the door is a challenge.

I used a couple of shop-made pins to help with this. To make the pins, file two brass screws to a point (Fig. 1). (Brass screws file down easily.) Then trap a pin in each of the top and bottom hinges for one door (Fig. 2).

Next, position the door and press it against the pins. This will transfer the screw locations to the door (Fig. 2).





A Handy Layout Tool

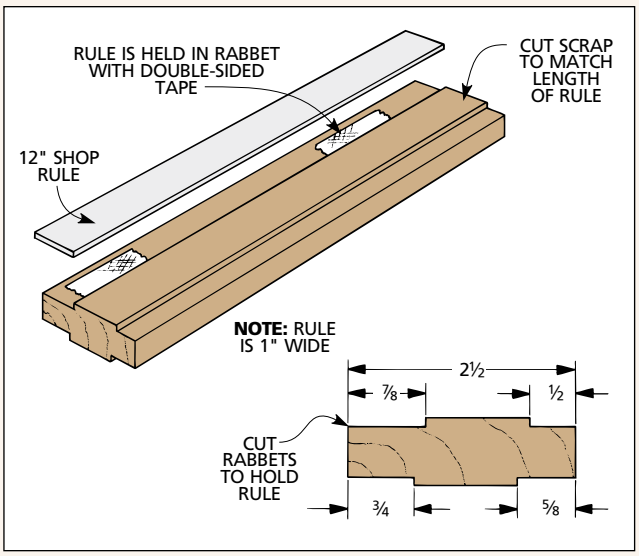
I like to secure my case backs with screws so they're easy to remove. Sometimes I've used as many as twenty screws or more, all spaced evenly around the plywood edge. That's a lot of screws to lay out.

Layout Tool – To make it easy to mark all the screw holes the same distance from the edge of the plywood, I mounted a ruler onto a piece of scrap. This eliminated the need for a tape measure.

First, cut the piece of scrap to match the length of a 12" shop rule (see drawing). Then, cut a shallow rabbet along the edge to hold the rule in position.

Cut the width of the rabbet narrower than the rule. This way it hangs over the edge of the scrap. The amount of overhang should equal the inset of the woodscrews.

To make it even more useful, cut a rabbet on the other three edges of the tool (see detail). This way, it can be used to lay out screwholes that require a different inset.



Double-Edged Spindle Turning Template

One year I made several identical projects for gifts. Each of them had ten spindles that I turned myself. When turning a single spindle to match a pre-determined pattern, all you really need is a ruler and caliper.

Template – But, if you're making multiple spindles, it's simpler and more accurate to transfer the pattern to a full-sized template first. Then turn each leg following the template, and they will all be identical.

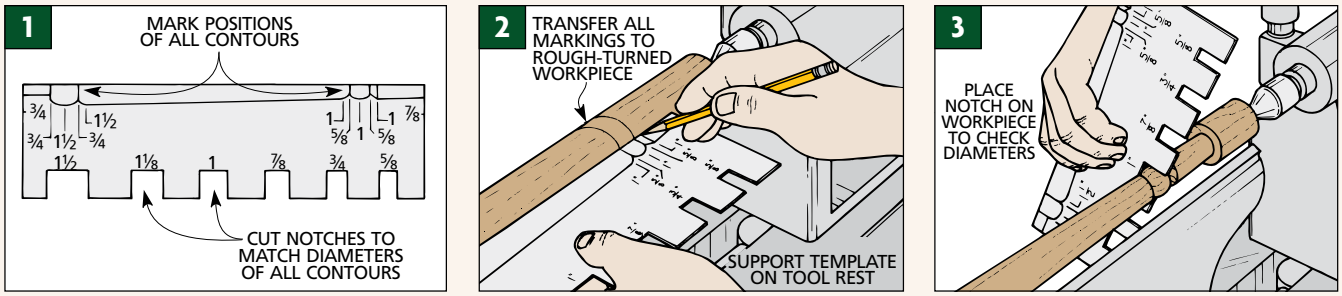
The template is a piece of 4"-wide posterboard cut the same length as the spindle (Fig. 1). What makes this template different is that there are marks along both edges.

Along one edge is a line of "tick" marks that serve as a ruler for laying out the pattern. The other edge of the guide has a series of cut-out notches used like a caliper.

Pattern Side – The pattern side of the template shows where the different contours of the leg pattern are to be positioned along the length of the workpiece. By holding this side of the template against the workpiece, the position of each contour can be marked with a pencil (Fig. 2).

Template Side – As the spindle is being turned, the other edge of the template works as an indicator gauge. It shows when you've reached the correct outside diameters of beads, tenons, and tapers, and the correct inside diameters of coves, fillets, and V-grooves (Fig. 3).

A template helps ensure all spindles turned from the same pattern look identical and make the project look that much better.



One Good Level Deserves Another

If you've ever had to replace a broken vial in an heirloom level, you know how hard it can be to install a new one. To get an accurate reading, you need to check it on a known level surface and adjust it if necessary.

But how can you check that a surface is level if you don't have a level? One way is to use a clear plastic tube filled with water (see photo at right).

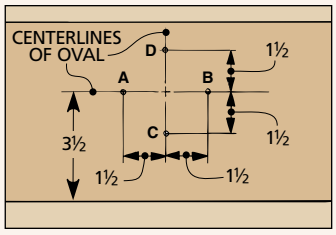
To take advantage of this, fit the ends of the tube into notches in a flat piece of plywood and add water (a drop or two of food coloring makes it easy to read the level).

Then slide one end of the tube up or down until the water column is flush with the surface of the plywood. This will move the water column at the opposite end either higher or lower. Then simply shim under the side of the level where the water is highest until the water columns are equal. (I used playing cards for shims.) Now use the surface to check your level.

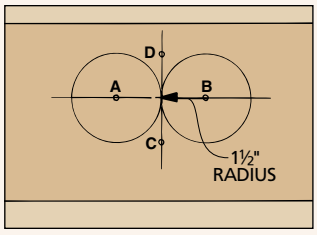
Drawing a Simple Oval

You don't have to be a whiz kid in geometry to draw an oval.

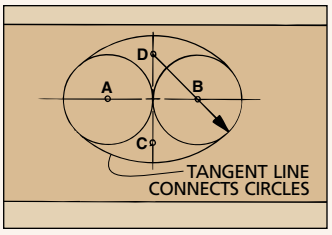
Points, Circles and Arcs – First, only four points need to be drawn. Then all you have to do is draw two "circles" and two "arcs" using a compass.



1 *From the center of the oval, measure and mark the centerpoints A, B, C, and D.*



2 *Use centerpoints A and B to draw two 3" circles to form the ends of the oval.*



3 *Use centerpoints C and D to draw arcs connecting the tangents of the circles.*