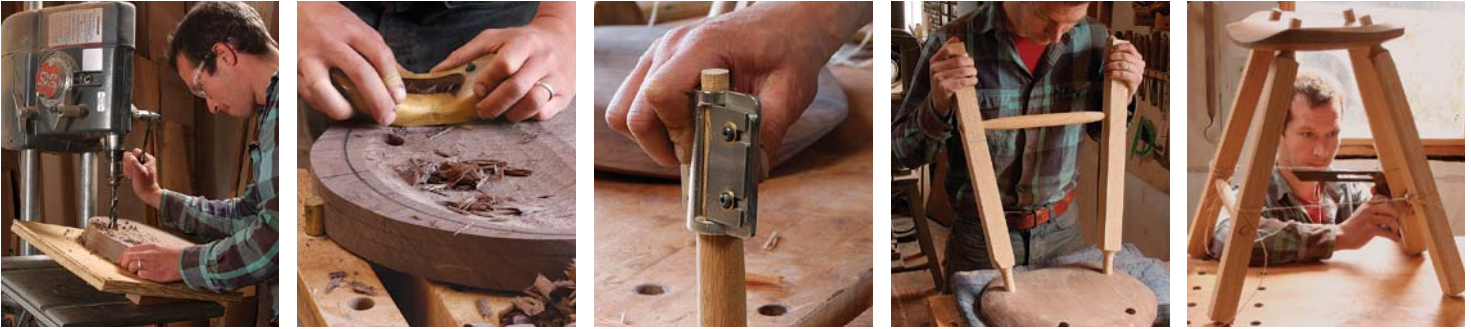# Build a Simple Stool

Fast, fun approach to making a comfortable, casual seat

BY FABIAN FISCHER

My woodworking career started seven years ago, when I purchased an old timber-frame house with a group of friends in a remote part of the Italian Alps. While restoring its roof and interior without electricity, I discovered the joy of hand tools.

When I got back home to Freiburg, Germany, I was eager to start building furniture using the hand skills I had learned. As luck would have it, my neighbor was a master joiner. He got me started, showing me a traditional way to build strong, beautiful chairs from rough lumber. Since then I've built at least 80, refining the process each time.

My approach is not complex. I simply fit parts and determine angles as I go. The work is about giving each piece its own character, and leaving the tool marks that make it unique. I think of it as beauty in imperfection.

This stool is a perfect example of my process. It is a good height to use at a workbench. Make it taller for use at a counter or shorter for use at a table.
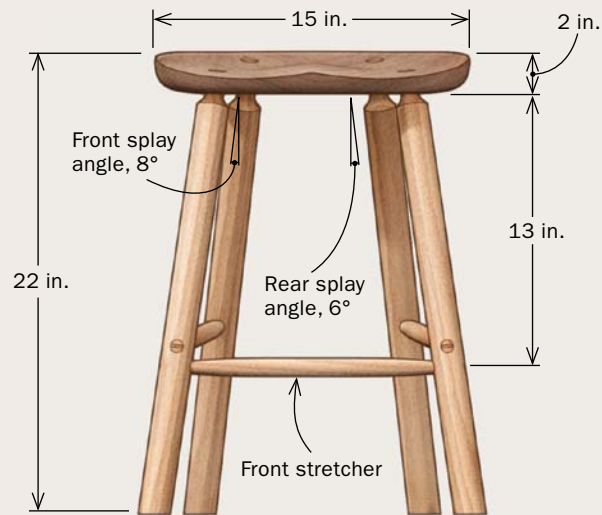
Lay out and drill the seat

I always start with the seat, which I often make from a softer wood than the legs to ease the shaping process. Basswood, poplar, and pine are good choices. You can also try walnut, cherry, or elm, but you'll work harder. For the legs, I use maple, ash, oak, walnut, and cherry.
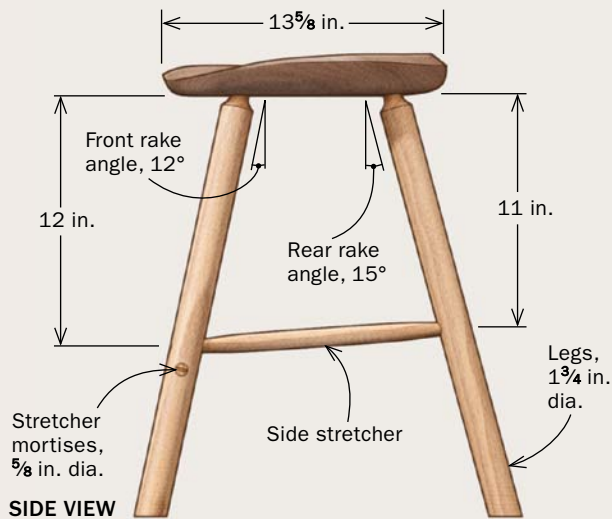
A BASIC STOOL

This article describes the process of building a midsize stool, perfect for use at a workbench. But the techniques will work for stools of all sizes; you just have to modify the dimensions.

15 in.

2 in.

Front splay angle, 8°

Rear splay angle, 6°

13 in.

22 in.

Front stretcher

FRONT VIEW

13⅝ in.

Front rake angle, 12°

12 in.

11 in.

Rear rake angle, 15°

Legs, 1¾ in. dia.

Stretcher mortises, ⅝ in. dia.

Side stretcher

SIDE VIEW

OTHER SIZES

The seat, leg, and stretcher dimensions and angles are similar or identical on these stools. Only the leg and stretcher lengths differ.
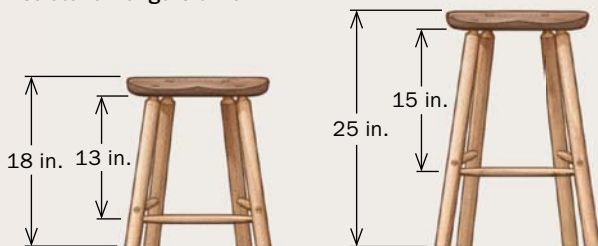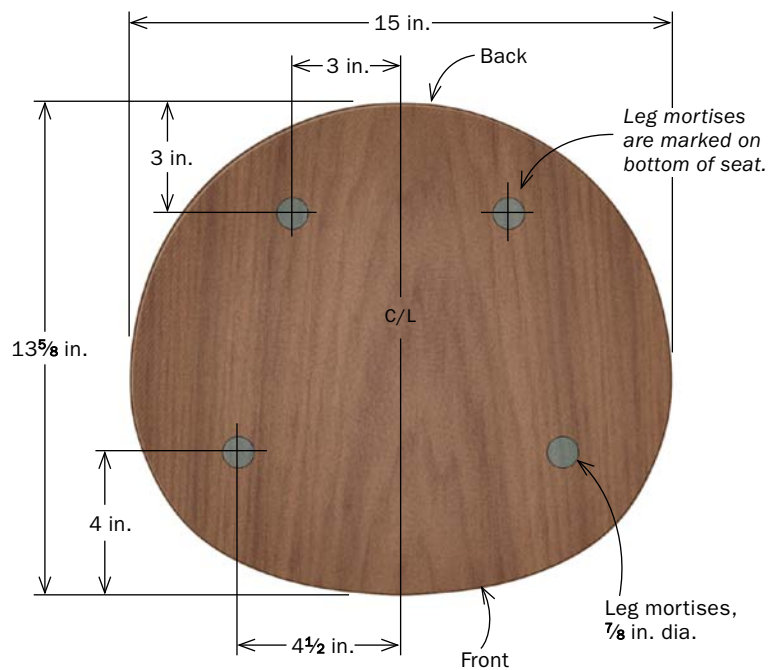
18 in. 13 in.

25 in. 15 in.

TABLE HEIGHT

BAR/COUNTER HEIGHT

Precise angles are important for the legs. The drill press lets you use the table to set one angle and a simple ramp jig to set the other. Make sure the seat's centerline is square to the drill-press table.

15 in.

3 in.

Back

3 in.

Leg mortises are marked on bottom of seat.

13⅝ in.

C/L

4 in.

Leg mortises, ⅞ in. dia.

4½ in.

Front

SEAT BOTTOM VIEW

Photos: Asa Christiana; drawings: Christopher Mills

Start with the big hollow. *Following penciled guidelines, work side to side with the travisher, always toward the center. Stay away from the guideline at the rear of the seat until you have reached full depth, and then work diagonally back toward the line, taking lighter cuts.*

Now the two thigh hollows. *Draw guidelines on the front edge, and work toward the center again. Use the travisher to knock down the high area between the two last steps, creating smooth transitions from back to front and side to side. Sit on the seat to check it for comfort.*

Scoop out the center section, about ¾ in. deep.

Bevel the top edge at rear.

Carve away thigh hollows.

Round the point (pommel).
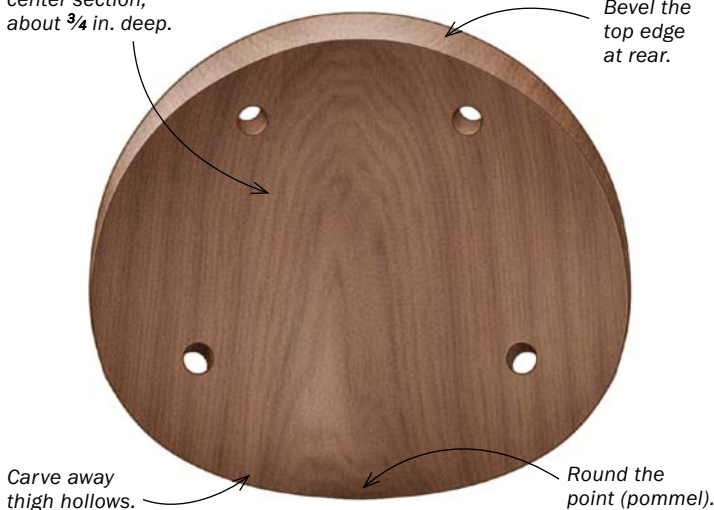
TOP VIEW
See Handwork on p. 74 for tips on using the travisher.

Top edges last. *Use a spokeshave to clean up after the travisher, thinning the edges and smoothing the surfaces as desired.*

The seat blank can come from one solid piece or can be glued up. My first step is to mark and drill the leg holes using a ⅞-in. brad-point bit. To guide the drilling, I use a simple template, setting up the angled holes using a bevel gauge. Pay very close attention as you drill. You want the legs spreading toward the outside of the seat, not the inside!

Shaping the seat: It's where the fun starts
The shaped seat is the heart and soul of this project, and it should be not only pleasing to the body, but also to the eye. I start with the top. The overall goal is for the hollow to flow from its deepest area in the back, getting continuously flatter toward the front of the seat until it flows downward at the front edge. The travisher

is by far the best tool to do this job efficiently (see Handwork, pp. 74–76). I use a spokeshave to smooth out the travisher work.

The last step is to contour the edges of the seat, top and bottom. I do the bottom edges first, where the shaping is minimal. I use a bench plane to do the rough work, and then finish with a spokeshave and a block plane. I flip over the seat and contour the edges of the top, using the same tools. At this point I don't worry about creating the final surface on the top side; I do that after the leg's tenons are inserted, wedged, and trimmed flush.

Special tools for leg and stretcher tenons
I use straight-grained pieces for the legs, as well as for the stretchers, avoiding inconsistencies like knots or curly wood. To cut the

Make the legs

Narrow the end first. *Fischer uses a drill-mounted cutter (below) to make the tenons. Before using the tool, you need to narrow the end using a spokeshave or drawknife (above). Draw a circle on the end as a guide.*

Pop in a stop. *The cutter makes 3-in.-long tenons—too long for this stool—so Fischer inserts a dowel into the cutter to act as a stop.*

⅞-in. Veritas Power Tenon Cutter

LeeValley.com
$94

leg tenons I use the Veritas Power Tenon Cutter, which cuts the tenon and a round shoulder. The goal is to have ½ in. to ¾ in. of the tenon poking out of the seat before wedging.

After cutting the tenons and inserting them in the seat, I locate the stretchers on the legs using a simple string trick to mark the mortises and their angles. Then I measure to the outside of the legs at the mortise locations—adding ¾ in. to each end—to get the stretcher length.

I drill the mortises for the front stretchers first. I set the drill-press table to match the splay angle of the legs (8° on this stool), and use a ⅝-in. brad-point bit to drill all the way through each one.

I don't like the look of a round shoulder on the stretchers, so I use a different tenon cutter for them—the Veritas Tapered Tenon Cutter. You spin it by hand, and it works like an oversize pencil sharpener, creating a long, tapered shoulder with a straight tenon at the end.

When the tenons are about ¼ in. extralong at each end, dry-fit the stretcher in the legs and see if the leg tenons will go into the seat. You are looking for some tension on the legs as they go into their seat mortises, so when someone sits on the stool later, the legs won't want to spread any farther. Trim the stretcher shoulders as needed by cutting deeper with the tenon cutter.

This stool has angled side stretchers. Again, I use the string trick to locate the mortises and to drill them at the correct angle. To drill the last two stretcher mortises, I dry-fit all four legs, plus the front stretcher, and use a hand brace and a very long ⅝-in.-dia. auger bit to reach through the rear mortises all the way to the front legs. This method guarantees perfectly aligned mortises for the side stretchers. I twist the rear legs as needed to line up the drill with the spots I marked on the front legs, then drill away.

Tenoning tips. *The cutter has a built-in level, so level the workpiece in the vise, watch the cutter, and you'll make a straight tenon. Go slowly until the blade is cutting, and when the cutter bottoms out, let it come to a full stop before withdrawing it.*

Add the front stretcher

Drill for the stretcher. Loop a string around the legs at the desired stretcher location and mark the center points of the mortises. Then draw a line on the front of the legs to get the stretcher angle. Tilt the drill-press table to the angle on the face of the leg and drill the mortises.

Rough-shape the stretcher now. Fischer uses a different tenon cutter for the stretchers (below). Before it will work, you need to taper the ends of the stretchers. Again, draw a circle on the ends to guide you.

Shape the tenon with hand power. The cutter leaves a long, tapered shoulder, and forms a straight tenon as you advance it like a pencil sharpener.

⅝-in. Veritas Tapered Tenon Cutter
LeeValley.com
$38

Test the fit. Fit the stretcher into the front legs and try to insert the legs into the seat. You want the stretcher shoulders to be a little bit too far apart, so the leg tenons are a bit difficult to insert, but not too hard. The same rule applies when sizing the side stretchers.

As before, I make the stretchers to fit and cut their tenons using the Veritas Tapered Tenon Cutter.

Assembly and finishing touches

Now's the time to take the legs from square and bulky to beautiful. I use a bench plane to create an octagon, and do the final shaping with a spokeshave.

After that, I dry-fit the entire stool, and mark the wedge slots in the ends of all of the tenons. This is a good time to make sure the stool goes together well and it's also a good time to mark the orientation of each leg and stretcher so there is no head-scratching when you have glue in the mortises. Last, I mark the leg tenons where they enter the underside of the seat to show

how deep the wedge slots need to go. I cut the slots on the bandsaw, but a handsaw works just as well. To keep the wedges from splitting the seat, cut the slots perpendicular to the grain of the seat. To be sure the wedges go all the way down in the all-important leg tenons, I widen the ends of the slots slightly, to about ⅛ in. The slots in the stretchers are just a simple sawkerf. I use straight-grained hardwood for the wedges, cutting them on the bandsaw at roughly 3°, and fine-tuning their width with a handplane.

For the assembly I use Titebond III, which offers more working time than standard yellow glue. I assemble the legs and stretchers first. Then I add the seat. I place the stool upside down across my thighs or a couple of 2x4s with a moving blanket on top so that I

String trick again. *Place the strings for the side stretchers wherever they look good to you, and line up a bevel gauge with the strings. Mark the mortise centers as before, as well as the drilling angle.*

Rear mortises on the drill press. *Use the bevel gauge to angle the table of the drill press, and drill the rear legs for the side stretchers.*

Break out the bit. *Getting the final stretcher mortise angles right is tricky, since the front legs can't turn now. Fischer solves the problem by extending a long auger bit through the rear mortises and turning the rear legs as needed to line up the bit for drilling the mortises in the front legs.*

Shape and slot the legs. *Before assembly, make the square legs round. Fischer uses bench planes (above) and a spokeshave for this, following circular guidelines on the end of each leg. Then he dry-fits the stool to mark the shoulders of the joints. Fischer uses a bandsaw to cut the wedge slot right to the shoulder line (right).*

Wedge the stretchers first. *Glue and assemble all the joints, and clamp along each stretcher as you wedge it. Apply glue to the wedges and drive them home (above). Finally wedge the leg tenons (left), and trim all the tenons flush after the glue dries. When cutting the legs to final length, Fischer levels the stool with wedges to mark them (below).*

can support the top without damaging it, while leaving room for the leg tenons to poke through.

The leg tenons enter the seat at a slightly misaligned angle until they are all the way home, so driving in the legs can be tricky. To avoid breaking a stretcher tenon, I drive in the legs evenly by alternating moderate mallet blows on each. When the shoulders of the leg tenons have bottomed out in the seat, I start wedging the stretchers. I finish by driving the wedges into the leg tenons in the seat.

After letting the glue dry overnight, I saw off the tenons and trim them flush. I use a broad gouge for final trimming, working toward the center of the tenon.

Last, I use cabinet scrapers to smooth out the seat. How smooth is a matter of taste. Sometimes I leave the travisher and spokeshave marks; other times, I sand to 220 grit. The last step is to level the legs, cutting them to final length in the process.

I prefer an oil finish on my chairs and stools. It gives a natural, rustic look and feel, and is easy to repair. □

Fabian Fischer is a full-time furniture maker in Germany, where he also teaches. Go to fabianfischerhandcrafts.com for more information.