

Steve Maxwell's

# BUILD-IT-YOURSELF **WORK**BENCH

Home-built design beats store-bought hands-down



# WORKBENCH

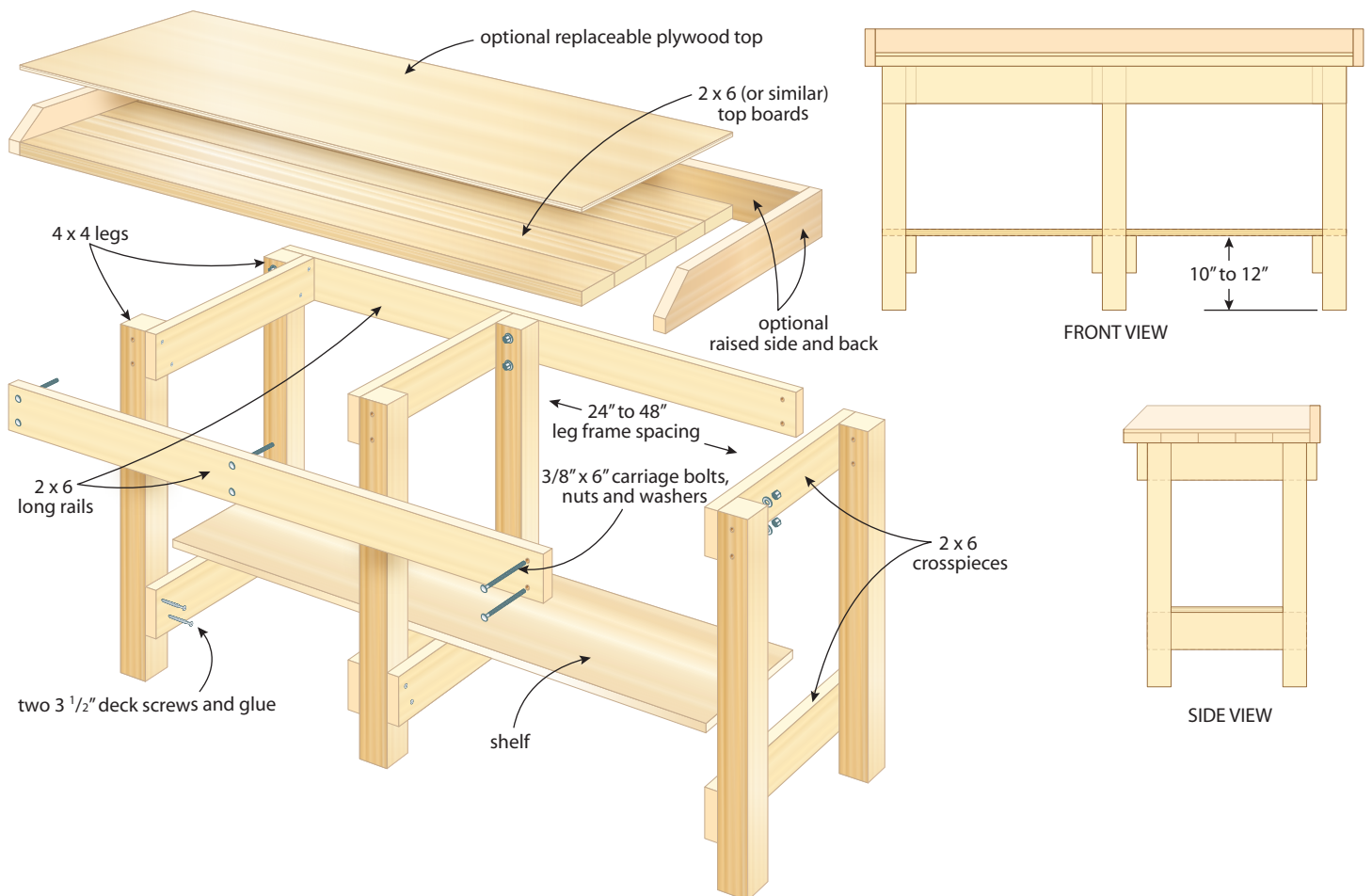
If you're interested in building self-reliance skills, a solid workbench is key to growing your capabilities. In fact, it's even more important than most of the tools you might use at a bench. That's because a good workbench makes so many jobs easier. Repairing small machines, assembling projects and building furniture are entirely dependent on a proper work surface of the right height. And the thing is, money can't buy a decent workbench. At least not at reasonable prices. If you want more than a light-duty portable workstation – and you don't feel like paying big bucks for something that's way fancier than you need – building your own workbench is really the only option. Learning exactly how to do this is what I'll show you here.

In the early 1980s I built my first serious workbench, and after using it nearly every day since then, I still call the design a success. That's why I figure it's worth passing on to you here. You can build your own version using standard construction-grade planks, or rough-cut lumber, as I did. Either way, you'll get a

bench that's heavy enough to be solid, simple enough for any handy person to build, and durable enough to last longer than you will.

There are three main parts to my design: the top, the legs and the storage shelf. But before you begin building, you need to do some figuring. How long should your workbench be? How wide? How tall? Mine has a top that's 9 feet long and 35" deep from front to back. That's a generous size if you can accommodate it, but your bench needn't be this big. You can go smaller (or larger), depending on your needs and available space. The only dimension that's important is bench height. The rule of thumb for any woodworking bench is an overall height equal to the distance between your wrists and the floor as your arms hang loosely by your sides. A general-purpose bench for, say, sharpening a chainsaw, fixing a broken toy or assembling a new garden seeder should be taller. My old faithful bench is 35" from floor to top of the work surface.

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## BUILD THE LEG FRAMES

The plans show how pairs of legs are joined together into frames, with the frames connected by the long rails, top boards and shelf boards. Your first task is to build as many of these leg frames as needed to get the total length of bench you want. Depending on the weight of things you'll be putting on your bench, aim for 36" to 48" between leg frames. If you're not sure what makes sense right now, build the minimum number of frames you think will do the job, then temporarily set some top and shelf boards in place and see how things feel. You can always make an additional leg frame before assembly if trial and error shows it's necessary.

You could use 2x4s for the legs, but 4x4s work better. Remember, a heavy bench is a good bench. Cut all the legs you need to length in one go, and all the crosspieces. A mitre saw is an excellent tool for easily and quickly getting these cuts perfectly square, but you can use a handsaw or hand-held circular saw, too. With all the legs ready, it's time to begin assembly, but first let me tell you about a trick to make this happen accurately.

A sheet of plywood or OSB placed on the floor is an excellent reference tool for assembling your leg frames so they're square. Since the corners of any sheet material are perfectly 90°, they offer ideal guides for positioning legs and cross pieces relative to each other. Place one leg along one long edge of the plywood as it sits on the ground, with the end of the bench leg aligned with the corner of the sheet. Place a second leg parallel to the first one, with outer edges of the legs spaced to match the length of your cross pieces. The beauty of using sheet material as an assembly guide like this is that it ensures square leg frames. As long as the ends of both legs are aligned with the edges of the plywood, and both legs are parallel, leg frames will have 90° corners, guaranteed. Double check your frames by measuring diagonals taken across the corners. Square leg frames will always have equal diagonals.

Back when I built my workbench, there was no such thing as deck screws. Wood screws available then were expensive and they didn't bite into wood like the best modern deck screws do today. That's why I used nails for my bench. That said, you'll be far better off to assemble your bench parts with deck screws. They hold better than nails and it's easier to drive them. My favourite deck screws are called Spax. The version I use are hot-dipped galvanized for rust-free exterior use and they have wavy threads that bite aggressively into wood.

Secure the cross pieces to the first pair of legs now. The upper cross piece needs to be flush with the top of the legs, and the second one 6" up from what will become the bottom ends of

## RENEWABLE WORKBENCH TOP

If you'll be using your bench for gluing or finishing wood, consider securing a replaceable layer of 1/4" underlay plywood on top. Use just enough small screws to keep the plywood secure. When the glue and mess get too much, simply remove the old ply and replace it with a fresh piece.

## ROUGH WOOD OR SMOOTH?

Standard construction-grade lumber of the kind used to build houses measures 1 1/2" thick, and this is an excellent material for a workbench top. If you live where small sawmills are in operation, rough-cut lumber makes a terrific bench. It's typically thicker than construction-grade lumber milled for the homebuilding industry (1 3/4" to 2" instead of 1 1/2" thick), and depending on the species, this extra thickness probably won't cost any more. The only issue to keep your eye on is how consistent the thickness of rough lumber is. Depending on the kind of mill used to saw the wood, rough lumber thickness can be quite consistent, or it can vary as much as 1/4" from board to board. Planing one side and one face of rough boards is the best way to make them consistent while retaining the greatest wood thickness.

the legs. Use two 3 1/2"-long deck screws and glue to hold each joint together. Assemble the other leg frames now, then compare them all with each other when you're done. If you've cut all the parts the same length, everything will be fine, though it pays to double-check. Fixing errors now is much easier than later.

## ASSEMBLE THE BASE

Now's the time to connect leg frames so they form the support structure for your bench, and long rails are the parts that make this happen. Depending on the length and strength you're aiming for with your workbench, 2x4s or 2x6s are the thing to use for long rails. Either way, these long rails fasten flush to the top of the legs. But before you begin assembling the base, let me tell you about another important trick. It's the easiest way to ensure your leg frames come together properly. Forget your carpenter's square, and grab a 24"-long level instead.

Start by finding a flat and level floor surface to set all the leg frames upright on, or create a temporary level surface. The sheet of plywood you used for assembling the leg frames will probably work fine if it's not warped. Either way, once you have all leg frames on a level surface, all you need to do is make sure they're straight up and down (called "plumb") as the long rails are fastened. Do this in reference to the level and all connections will be square. This is much easier and more accurate than using a carpenter's square.

Recruit a helper to hold the leg frames up and keep them in position as you apply wood glue and secure each long rail-to-leg joint with a single deck screw, set off-center so you have room for a second screw later. You could certainly forget the glue, but it's amazing how much strength and rigidity it adds. For all the time it takes, why cut corners?

Your bench won't be very strong at this stage because the glue is still wet, but that's okay. Check that the leg frames are all plumb one more time, then add a second screw to each joint. If you want the strongest possible bench, get out your drill and 3/8" diameter carriage bolts without wasting time. Bore holes and draw the joints

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together tightly with the bolts before the glue dries. Besides pulling the joint together tightly for maximum glue strength, if things ever loosen up as the wood dries and shrinks in the future, you can tighten up the joints as good as new with a wrench.

## ADDING THE TOP

You can build the top of your workbench with 3/4"-thick plywood or solid 2x6, 2x8 or 2x10 lumber. I prefer to use planks here because they don't cost any more than plywood, and they make for a stronger, heavier bench. There's also no need to cut any of the boards lengthwise to get a specific workbench top width. You can usually mix and match different standard widths of lumber to deliver the ideal 1" or 2" of overhang on the sides and ends. As you figure things out, remember that a construction-grade 2x6 measures 5 1/2" wide; a 2x8 is generally 7 1/4"; and a 2x10 is typically 9 1/4" wide

If you're using lumber for the top, make sure all boards are cut to the same length, then arrange them tightly as they come

## VICE ADVICE

As useful as a good workbench is, you'll also need to add some kind of vise to make the bench as useful as possible. And the work you plan to do affects the hardware that makes sense.

A machinist's vise with 6"-wide jaws is my favourite all-around option for holding anything metal, plus wood and plastic where surface denting doesn't matter.

If you'll be using your workbench primarily for woodworking, then consider a face vise made especially for this job. It's wider than a machinist's vise, and uses pieces of hardwood to form the working faces of the jaws.

## POTTING BENCH AND SINK

Insetting a removable potting tub or two into the top of your bench is easy and useful. Buy a sturdy plastic tub with a lip, measure the length and width of the body of the tub, then mark it on the bench top, somewhere between leg frames on the right or left hand side of the center legs. Use 2x4s to reinforce the underside of the top immediately on each side where the tub will go, then bore a 1" diameter hole through the bench top, just inside

the lines, one at each corner. Cut all four sides of the opening using a jigsaw, then drop the tub into position. You're now ready to store soil or potting materials right at bench level.

If you'd like to add a sink and running water to your bench, you've got a couple of options. You can install a sink the same way as a potting tub, or inset it below the surface so the sink can be covered with a removable piece of plywood when-

ever you want a continuous benchtop work surface. A reclaimed stainless steel kitchen sink is ideal for covering in this way because the perimeter lip is thin. Cut a reinforced opening in the benchtop and install your sink as you would any potting tub. Next, cut a piece of 3/4-inch plywood the same size as your workbench top, so it rests on the top boards, with an opening cut for the sink that's as large as the outer edges of the sink's lip. Cut a matching piece of 5/8"-thick plywood to fill this space and you've got a removable cover that sits flush with the rest of the benchtop when you're not using the sink.

A reclaimed kitchen faucet is a more convenient way to bring water to your sink than a garden hose, and it's not difficult to install. Fasten 6" or 7" lengths of 1/2" diameter copper pipe onto the inlets of your faucet if it doesn't have any, then use four copper pipe mounting straps to secure the faucet to the back face of the benchtop back. Fit the end of one of the copper pipes coming off the faucet with a quick-release hose fitting, and it's easy to connect and disconnect the water supply to your bench. Drain waste water from the sink into a pail or a graveled area underneath the bench, and you're ready to wash vegetables outdoors, keeping mess out of your kitchen. An optional raised back and sides on the benchtop helps keep potting supplies and tools from rolling off during use.



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together on the leg frame. Gaps between boards aren't what you want, since dirt and small tools will fall down onto the items stored on the shelf below. If you can get a couple of pipe clamps to draw the wood together, that's perfect. If not, just pull the wood tight by hand while you fasten the boards to the cross pieces below. Two or three 3 1/2" or 4"-long deck screws driven into each top board-to-cross piece joint will do the job. Use no glue on these joints, since you want the option of removing and replacing top boards later, if they get damaged.

## FINISH WITH THE SHELF

The shelf is nothing more than a replica of the top, except that it fits between the legs, not on top of them. And unless you'll be storing exceptionally heavy things, 3/4" plywood is fine for the shelf. Cut the shelf boards so they fit between legs, and fasten them with screws only.

Workbenches are one of those things that are best made, not bought. Take the time to build yours right and you'll never need to wish you had a better bench again.

## COMPOSITE WORKBENCH

In 2002 I built an outdoor bench to support baskets of wet clothes and clothespins underneath our outdoor clothesline, and it hasn't deteriorated a bit during this time. Composite lumber is the reason why. The Trex I used isn't as strong as wood, so the leg frames need to be closer together. Other than that, a composite workbench is the perfect thing for year-round, outdoor duty.

