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Sawhorse Roundup

A selection of new and traditional designs for sawhorses that are easy to build, strong and lightweight

Thoroughbred or workhorse, a good sawhorse is a carpenter's best friend. Featuring tapered sliding dovetail joints, Rob Hare's teak sawhorse (left) is rugged enough to hold a stack of 2x6s but probably more appropriate supporting a glass tabletop. The typical horse (right) is easily assembled with job-site scrap material and has a sacrificial plywood layer.

by Andrew Wormer

You can tell a lot about a carpenter by his sawhorses. Having said that, let me confess that I own a set of sawhorses that is falling apart. Inherited along with the first "fixer-upper" house I ever bought, they wobble like drunken cowboys, the legs have been shortened more than once to get rid of rot, and I'm constantly pounding their loose nails back into place. I'm reluctant to toss them because they're still useful, despite the abuse and neglect that have been heaped on them over the years. Sometimes sawhorses just don't get treated very well. I've seen horses holding up a load of ¾-in. plywood with a 250-lb. carpenter wielding a worm-drive saw on top. I've watched them in the rearview mirror of my truck, bouncing on the highway as I drove away at 55 mph. I've seen them cut almost clean through by carpenters who don't realize that the blade in a circular saw can be raised and lowered.

Part of the beauty of sawhorses is that they are pretty easy to build out of materials that are readily at hand. Of course, metal sawhorse brackets that quickly clamp onto 2x lumber are also available, but these brackets don't make sawhorses I'd want to stand on. And having to buy a part for a sawhorse is a real psychological barrier for most carpenters. That is why many of the sawhorse designs I've seen rely on the flotsam and jetsam normally found on a job site:

Building a traditional sawhorse

Tom Law's sawhorse, which first appeared in *Fine Homebuilding* in 1987 (*FHB* #43, pp. 56-57), is based on traditional designs in old carpentry textbooks. I've built several pairs of sawhorses over the years using this design as a model. With the legs splayed in two directions, this horse is extremely stable and is virtually impossible to tip over, even when loaded on the end of the cross beam. Also, all of its components can be cut with a handsaw or circular saw and a chisel.

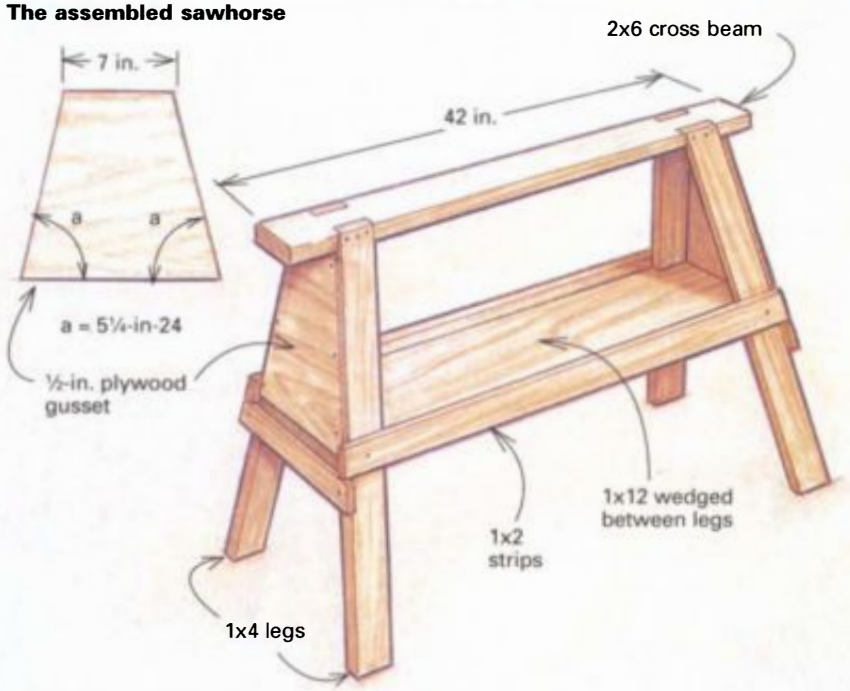
The joinery of this sawhorse is a little tricky because of the compound angle of the legs and the gains, or mortises, for the legs cut into the cross beam. It is possible to calculate these angles using trigonometry, but an easier way is to use a framing square and a bevel gauge. The legs of a 24-in. high sawhorse that splay 4 in. lengthwise from the vertical will have a slope of 4-in-24, or an angle of 75°.

The angle of splay across the width can be determined the same way. A typical outward slope is 5¼-in-24. This design should leave an overall width of a little less than 14½ in., making these horses easier to carry through the bays of a stud wall framed 16 in. o. c.

Trigonometry can also be used to determine the leg length if you want the horses to stand 24 in. tall, but if your math isn't sharp, try cutting the legs to 24¾ in.; this measurement should get you pretty close. If you plan on building a lot of horses, a radial-arm saw or compound miter saw can make cuts easier, and a simple jig as shown below can speed up the cutting of the gains.

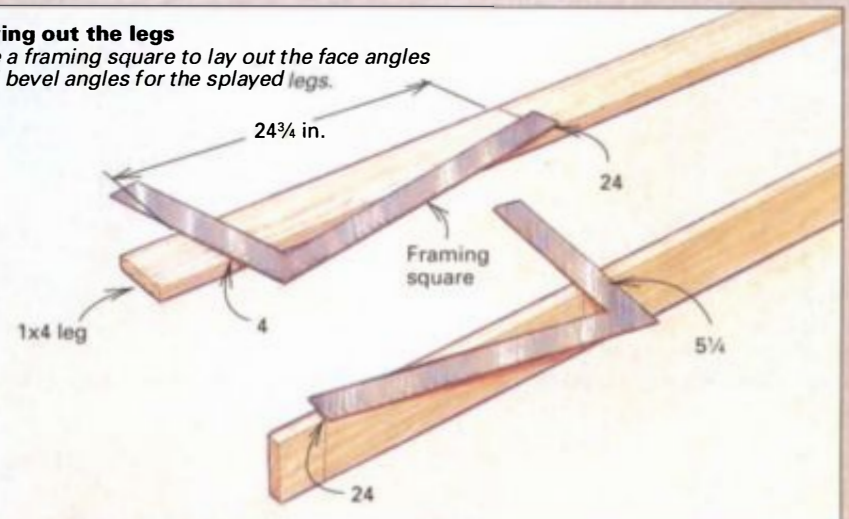
Connections should be made with wood screws or nails and construction adhesive. Drywall screws are brittle and can suddenly snap under loads, which makes them a poor choice for sawhorses.—*A. W.*

The assembled sawhorse

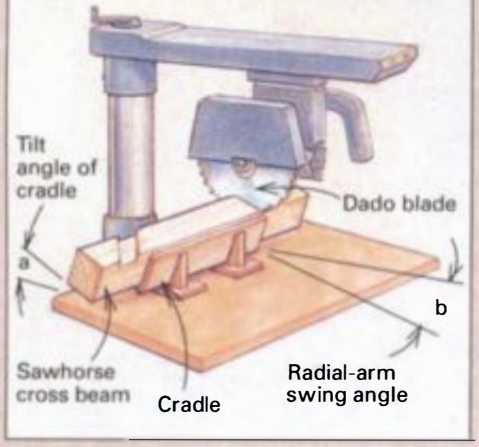


Laying out the legs

Use a framing square to lay out the face angles and bevel angles for the splayed legs.

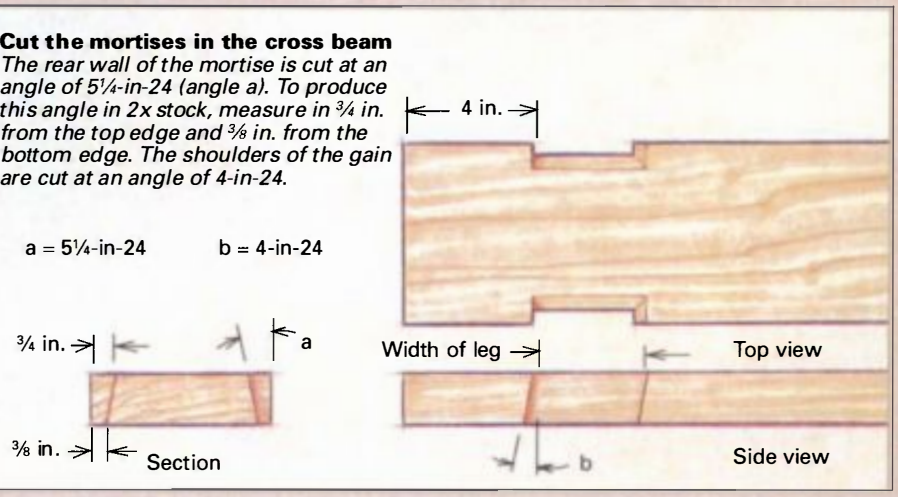


A jig for cutting sawhorse mortises



Cut the mortises in the cross beam

The rear wall of the mortise is cut at an angle of 5¼-in-24 (angle a). To produce this angle in 2x stock, measure in ¾ in. from the top edge and ⅜ in. from the bottom edge. The shoulders of the gain are cut at an angle of 4-in-24.



Drawings: Dan Thornton

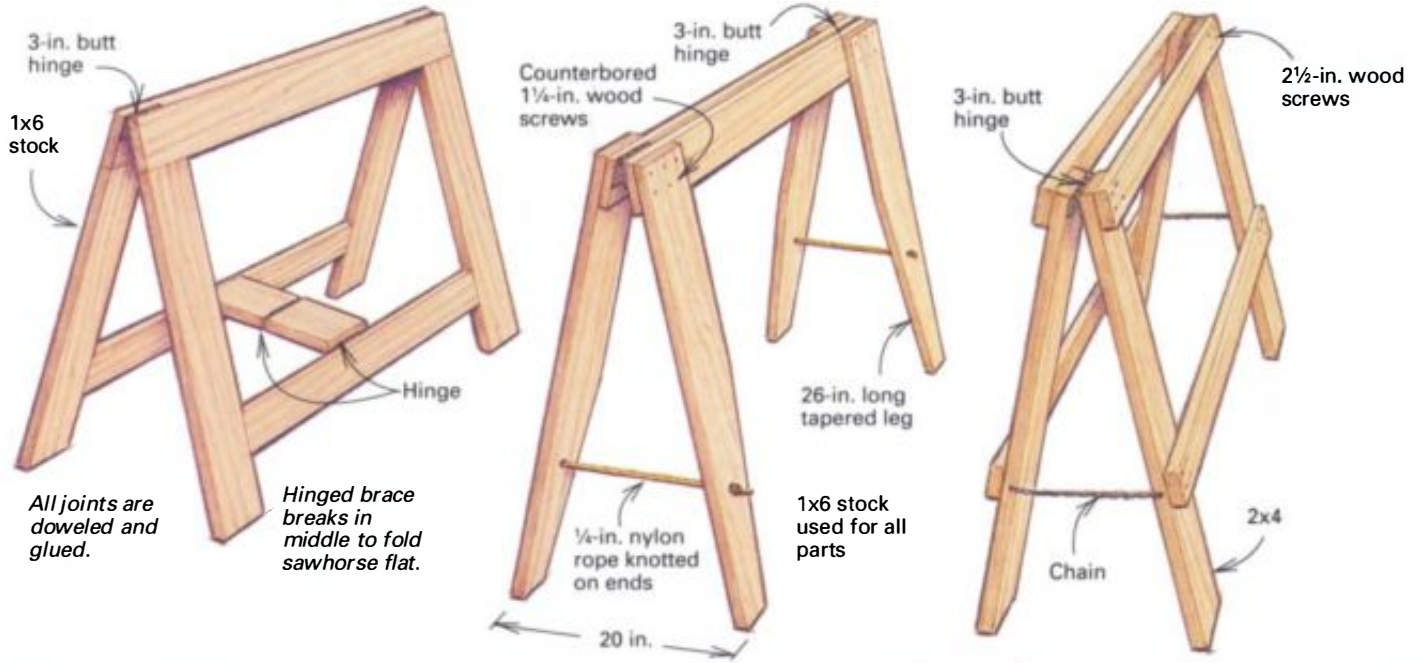
odd lengths and sizes of lumber, scrap plywood, spare joist hangers and connectors, and assorted screws and nails. The editorial staff here at *Fine Homebuilding* thought that it was time to bring together the best of these designs: some of them previously published in the magazine, some of them from other sources and some of them brand new.

A good sawhorse is strong and light—Everyone has heard the story of the new man on the job site who is asked to build a pair of sawhorses. If he can turn out a serviceable set in a reasonable amount of time, he gets hired; if not, he hits the road. Personally, I've never met any carpenter who has had to take this kind of entrance exam, but it makes sense: Building a sawhorse is a good measure of a carpenter's ability to think in three dimensions; understand (at least intuitively) trigonometry; and accurately measure, cut and assemble lumber.

Obviously, the first task of a good set of horses is simply to stand up, sometimes under surprisingly heavy loads. Strength is just one variable in the design equation, though. Often, the same

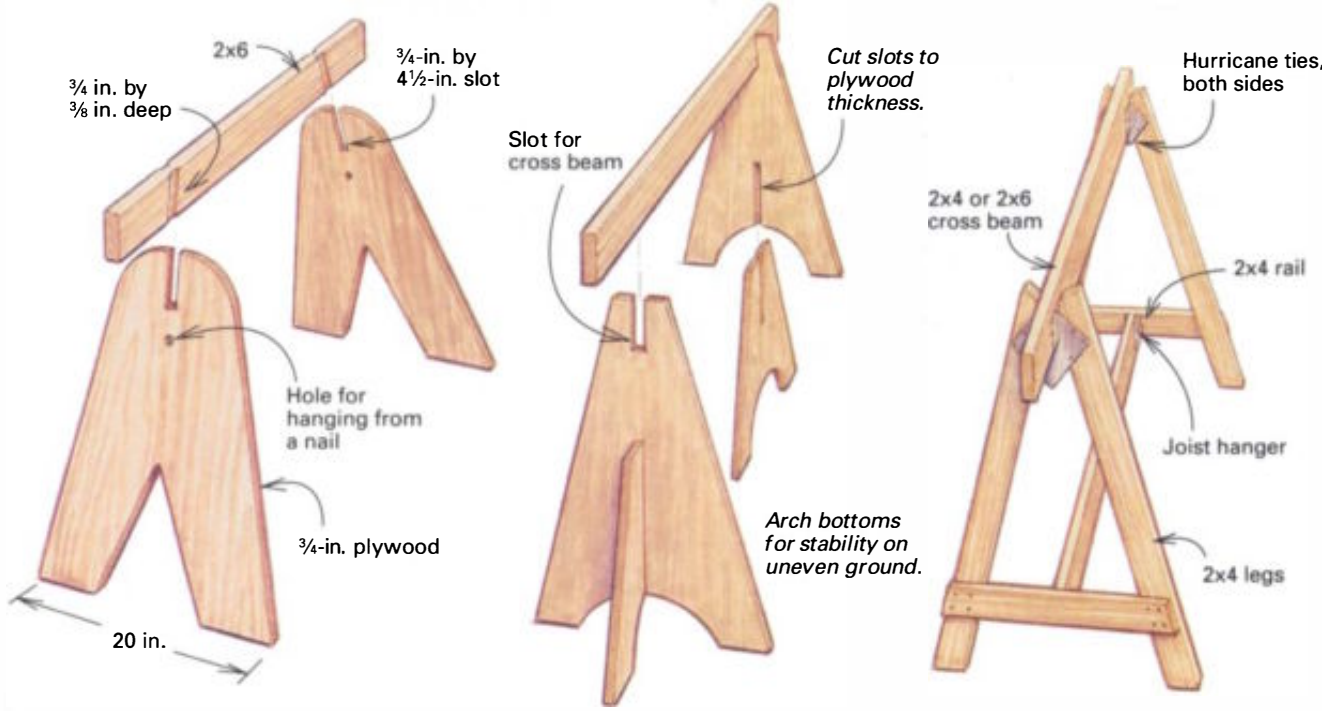
Folding sawhorses

The simplest design for a folding sawhorse relies on butt hinges to hold the two sides of the sawhorse together. While either rope (center) or a length of chain (right) can be used to keep the legs from spreading, folding card-table brackets can also be used; these devices will help keep the legs from inadvertently closing. Butt hinges are close to the top plane of the cross members and are a potential sawblade obstacle.



Knockdown sawhorses

An alternative to a hinged horse is a horse that comes apart. Horses with legs of scrap plywood (left, center) can be handy in a shop with limited storage space because the legs can hang flat against a wall on a nail. Joist hangers and hurricane ties are found on job sites and can be used to make strong, easily assembled horses (right). If screwed together, the joints won't fall apart when the horses are moved around.



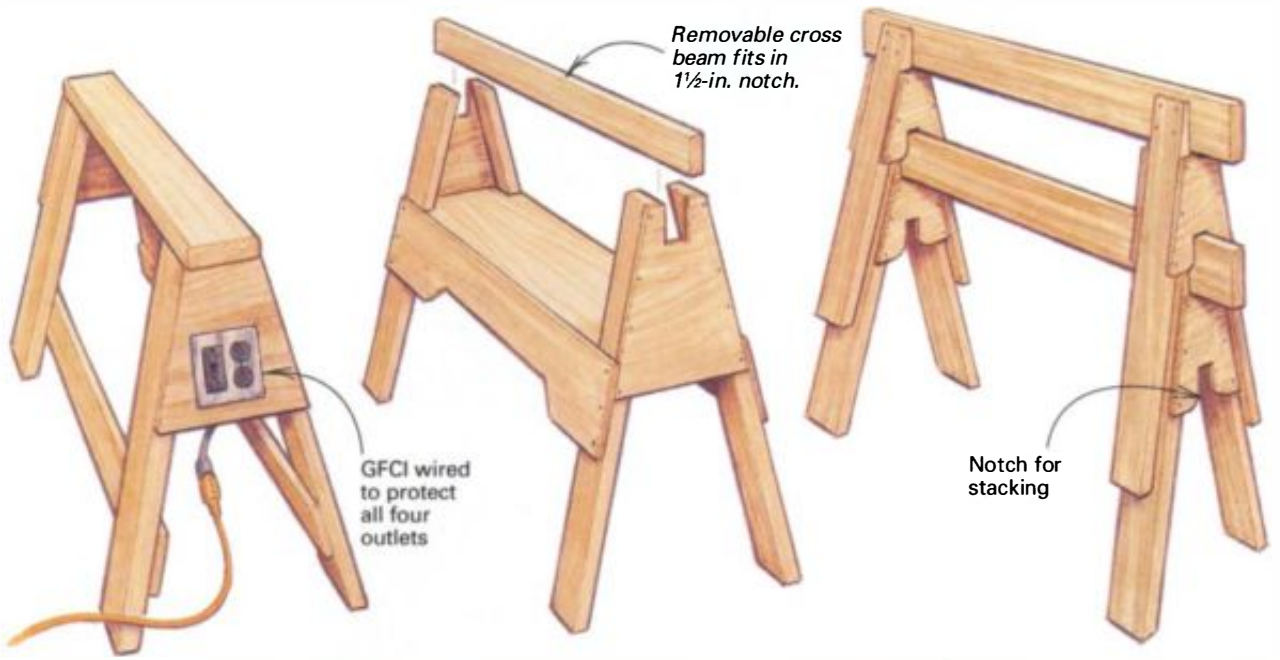
set of horses that held the big stack of 20-ft. long 2x12 lumber for framing rafters early in the job will be brought inside later and be used to hold trim for painting.

So sawhorses have to be strong, relatively lightweight and relatively easy to move around. Because most carpenters don't have specialized sawhorses for specialized tasks, the best sawhorse designs juggle strength, light weight and portability. Of course, the more engineering required to achieve a high strength-to-weight ratio, the more complicated and labor-intensive the construction can become.

It's easy enough to design and build a basic sawhorse with simple hand tools and readily available lumber (sidebar p. 49). The cross beam, or saddle, is generally cut from 2x4 or 2x6 lumber and is usually between 3 ft. and 4 ft. long. Although the length can vary, especially with sawhorses that are intended to nest together when being stored or transported, a 42-in. board provides a good width to clamp a 3-ft. door to, yet still provides adequate support for 4x8 sheet goods. Straight, clear lumber is best

Souped-up sawhorses

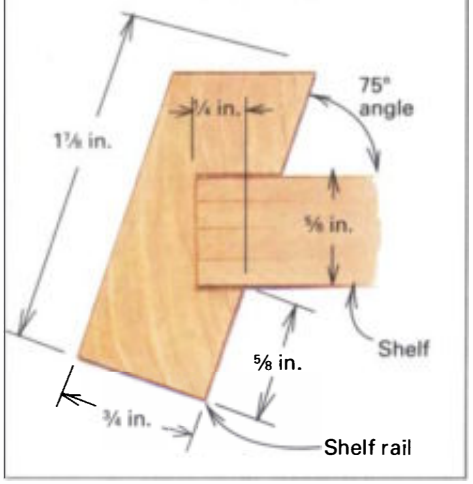
Adding a GFCI-protected four-outlet electrical box to a sawhorse (left) turns it into a workstation and eliminates a lot of power-cord clutter. The removable cross-beam feature (center) allows the height of a sawhorse to be varied or allows a worn cross beam to be easily replaced. Notching the bottom of the gusset (right) allows the horses to stack compactly and securely, a handy feature with multiple sets of horses and limited space.

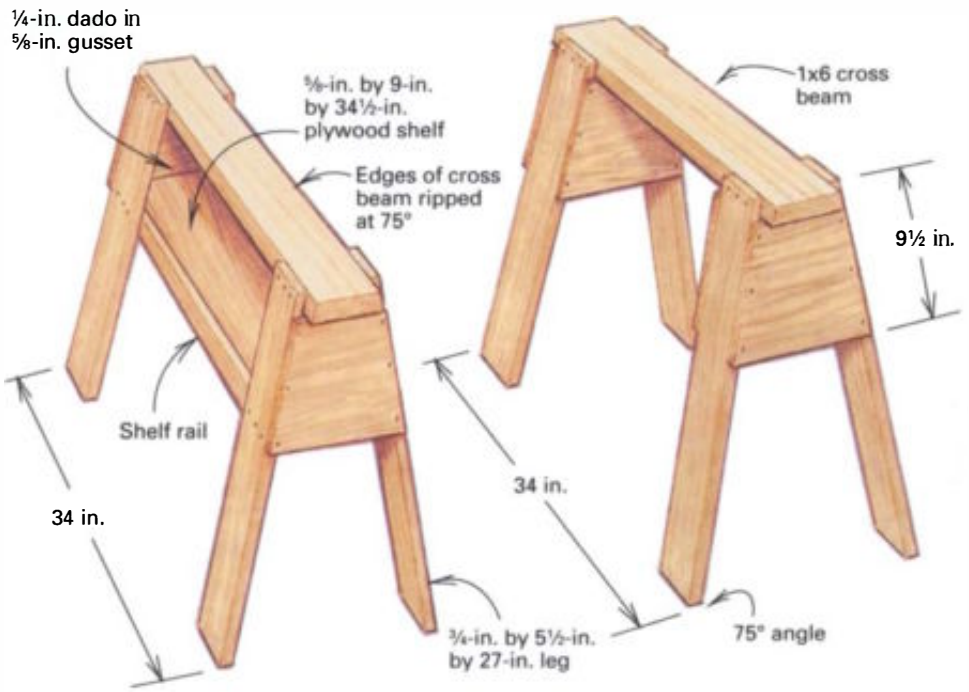


Norm Abram's sawhorse

This design is a favorite of popular TV carpenter/host Norm Abram. Assembly is a bit simpler than Tom Law's horse (p. 49) because the legs are splayed in only one direction and because there is no mortise to cut in the cross beam. Both sides of the cross beam are ripped to 75°, as are the bevels on the legs. A shelf can be easily added (see shelf detail, left), or extra interior gussets attached for strength (right).

Shelf-rail detail
Shelf construction requires a dado cut at an angle in the shelf rail, a cut best made with a table saw and a dado blade.





for the saddle because many designs depend on gains, or notches, that must be chiseled or cut out of either end. Also, a twisted cross beam will prevent the horse from sitting square.

Sometimes the cross beam of a horse will be oriented vertically rather than horizontally. Painters like this configuration because it means less surface area to mar freshly finished trim. Also, 1x material can be used for the cross member, which helps to cut down on weight. On the other hand, this kind of sawhorse doesn't provide much of a working surface for someone using the horse as a bench.

Although 1x4 or 1x6 stock is commonly used for leg material, 5/4 or even 2x4s can be used if strength is a key consideration. Wide legs can be tapered to save on weight.

The nominal height of a sawhorse is typically 24 in., which not coincidentally is a comfortable height for most people when sawing a board.

An elegant connection. Although it can be tricky to cut, a tapered sliding dovetail makes a strong and detachable joint between the leg and the cross beam.

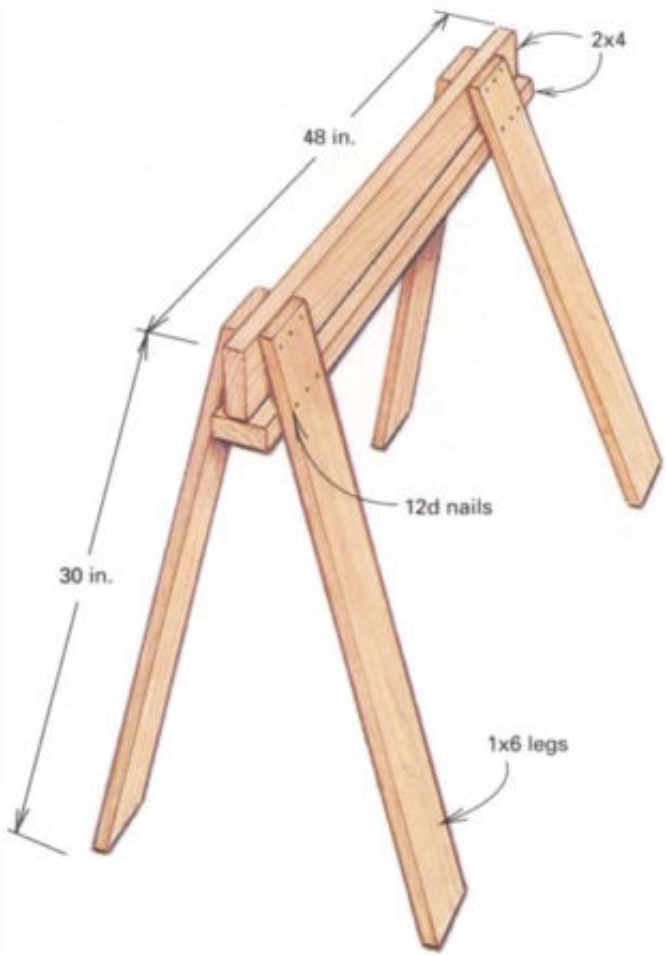
Although the 2-ft. height works best for most cutting operations, I've found that a higher horse—perhaps 30 in.—is often more comfortable for activities such as painting or sanding. Lower horses give me a sore back if I have to spend much time hunched over them.

Taller folks often tend to like proportionally taller horses. And of course, if you make a tall set of horses and you don't like them, they can easily be shortened. It is quite a bit harder to make short horses taller, although very short horses—around 12 in. or so—are sometimes useful for holding cabinets at a comfortable working level or for supporting scaffold planks when installing crown molding.

Not just a one-trick pony—Sawhorses often will be pressed into service as job-site workbenches. I've found that finish carpenters often use a sawhorse with at least a 2x6 cross beam so

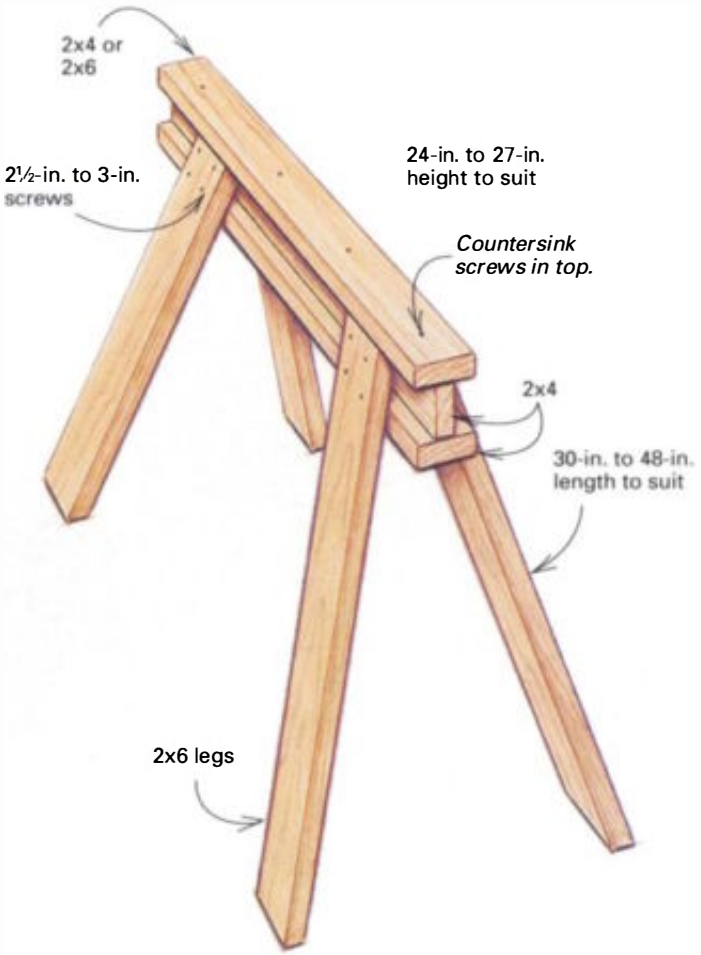
Larry Haun's California framer's sawhorse

Given a 2x4 stud, four 30-in. 1x6s and a nail gun, longtime Fine Homebuilding *contributor Larry Haun can put these horses together in the time it takes to drink a cup of coffee. Because of the small investment in labor and materials, the horses can stay behind when the job is over.*



Jim Tolpin's timber framer's sawhorse

Woodworking author Jim Tolpin's site-built sawhorse is ideally suited for holding heavy timbers. The cross beam is essentially an I-beam constructed out of screwed and glued 2x4s. The legs are 2x6s screwed to the I-beam cross member, which makes for a heavy-duty sawhorse.



that chisels and block planes are less likely to fall onto the floor. I've even seen cross beams made of 2x8s. A slot cut into the center of the cross beam will make these horses easier to carry around, and a notch cut into one end can be used as a door buck.

A lower shelf is handy for holding extra tools, particularly when the horse is being used as a workbench, and shelves also make the sawhorse sturdier. But shelves tend to be real sawdust collectors. Sawhorses with shelves are difficult to transport as well because the horses don't stack as compactly. One way around this problem is to build one horse in a set with a shelf and the other without.

Sawhorses are often used for scaffolding, especially in interior work where there are level floors and uniform wall and ceiling heights. A sturdy shelf with a strong shelf support can be used as a step to get onto the horse. Another advantage of horses with sturdy shelves is that they provide two working heights for a scaffold plank, which can be set either on the shelf or on the cross beam.

You can take them with you—One beef I have about conventional sawhorses is that they aren't very portable. Sure, you can pick them up and carry them around, but when the job ends and the truck is packed and the sawhorses are still standing there, you begin to weigh the advantages and the disadvantages of making another trip back to the job site to pick them up. More than one set of sawhorses has been left behind at the job site because there simply was no room for them in the back of the truck along with all of the other tools.

There are two approaches to this problem: folding sawhorses and knockdown sawhorses (drawings p. 50). The first uses readily available butt or strap hinges at the leg/saddle junction, along with a retaining chain or rope to keep the legs from spreading too far apart. The second approach is to make the sawhorse so that it holds together with engineering and gravity, or by the judicious use of a few connectors and screws. If you're feeling ambitious, you might try building sawhorses with tapered sliding dovetail joints, like the ones by Rob Hare (photos p. 48, facing page). Perhaps the most elegant design I've seen, these horses are strong and lightweight. They also come apart in seconds and look like fine furniture. The only problem is that although they're rugged, I don't think I'd feel comfortable dripping paint on them or putting a saw kerf through the cross beam. □

Andrew Wormer is an assistant editor for Fine Homebuilding. *Photos by Scott Phillips, except where noted.*

A knockdown saw stand

Chicago-area carpenter Jim Carroll's design combines the functions of a sawhorse and a portable saw stand. Ripping a 4x8 sheet of ¾-in. exterior-grade plywood in half lengthwise provides enough material for two horses. The cross beam is an 8-ft. long 2x6 with 1x2s through-bolted at a 15° angle to accept the slotted plywood legs. Joist hangers are used to stabilize the tabletop, which drops into saw kerfs cut in the cross beam, and the end supports, which are mounted on either end of the 2x6 cross beam.

Photo this page: Boyd Hagen