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WHAT YOU
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PAINT



HOUSE



FENCE/PATIO



VEHICLE

ON THE COVER

Build a Viking table big enough for the whole clan—for less than \$200! Photographed by Tom Fenenga

30 Built-to-Last Viking Table

It's solid as a rock and buildable with basic tools.

42 Easier Paver Patios

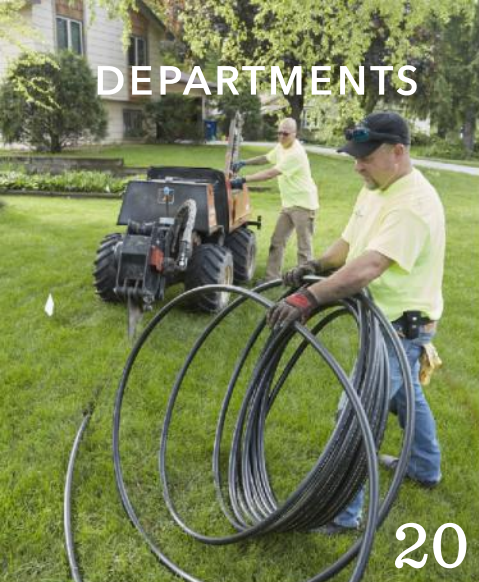
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Welcome to the DIY follies—tales of flying paint, flaming cushions, and no-flow faucets.

DIY Universe

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face, blued Breguet-style hands, an easy-to-read date window at the 3 o'clock position, and a crown of sapphire blue. It secures with a crocodile-patterned, genuine black leather strap and is water resistant to 3 ATM.

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Stuff We Love

Our favorite DIY tools, materials + gear. By Spike Carlsen



WHAT DUST?

Universal Router Hood

I have a love-hate relationship with my routers. I love that they can take a chunk of wood or a ho-hum project and turn it into something polished and classy looking. I hate that they scatter dust and debris to all four corners of my shop.

That's why I was intrigued when a box emblazoned with "UNIVERSAL DUST-FREE ROUTER HOOD" landed on my workbench. Could it really eliminate dust? And would it really fit my router without a lot of hassle? The answers are yes and yes.

Let's be clear: This router hood isn't something you just clip on and use. It requires removing your router's original base plate and replacing it with the two-part universal base plate with a dust collection dome pinched in between. (It took me about 15 minutes to do this the first time and less than five minutes the second.) Once that's done, you snap the deep or shallow chip cover in place, attach your dust collection hose and then go to work. It's a little fiddling around, but once you're ready to

route, the system really performs—perhaps no surprise given it was developed by Oneida (oneida-air.com), which specializes in dust collection. You can quickly remove the clear hose port and chip covers if you want to work unencumbered. The system is compatible with most fixed-base and plunge routers. I also like routing with a crystal-clear base—it makes it easier to see what's going on below.

The Oneida router hood costs about \$35 at hardware stores, home centers and online.



SMART SOLUTION

Electronic doorbell security

Ever wish you could see who's at the door, even when you're on vacation in Jamaica? You can with the Ring Video Doorbell. It works with your home's Wi-Fi system to connect the outside "doorbell" module with your computer or mobile device. It's also way cool! Just download the app to get alerts and photos or videos showing you who's at the door. You can even carry on a conversation with the person because the outdoor module has a built-in microphone and speaker. It's activated when they push the button or trigger the motion detector.

Installation is easy, and the device comes with everything you need but a drill. If you have existing doorbell wires, they'll provide the power. If not, the built-in rechargeable battery will do the job. But going battery-only means the live-feed video feature won't work—you'll get photos only.

Expect to pay about \$180 for the basic model at Best Buy or Home Depot stores, or search for one online. Learn more at ring.com.

TRAVIS LARSON, SENIOR EDITOR



PRO FEATURES FOR LESS

Great string trimmer for the money

I needed a new string trimmer but didn't want to spend the \$300 to \$400 that most home centers were charging. Then I found this one made by Jonsered (model GTS 2228; jonsered.com). It works great and has plenty of pro-quality features like a straight shaft, an adjustable handle and a "Tap'n Go 35" head—which makes dispensing new string a breeze. It also has lots of power and starts right up with a pull or two.

I bought mine for about \$220 at Menards, a Midwest chain of home centers. You can also find them at Tractor Supply Co. stores and many independent dealers.

JASON WHITE, CONTRIBUTING EDITOR



FUN & FUNCTIONAL

LED ROPE LIGHTS

The Luminoodle is part flashlight, part lantern and part gee-whiz. The waterproof 5- and 10-ft. rope lights can be hung as general or decorative lighting or placed in the nylon carrying bag for use as a lantern. The battery pack is rechargeable via a USB port and can be used to power the light, your cell phone and other small devices.

The 5-ft. Color Light Rope (\$40) has 15 color options and a remote control for changing the color, intensity and blink pattern. Great for camping, road emergencies, party lighting... the uses are endless. Learn more at powerpractical.com.





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- 2) Handi-Kirb
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Sheet Membranes



Tools used:

- 1) Quick-Pitch®
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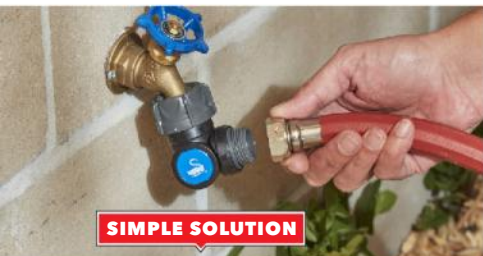
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STUFF WE LOVE



SIMPLE SOLUTION

KINK-FREE HOSE

Watering my garden is a big enough hassle without having to bend over to attach the hose to the spigot and stop to unkink it every three minutes.

The Swan Hose Swivel solves both problems. Attached to the spigot, it can swing up and down 180 degrees and rotate 360. This means securing the hose requires fewer contortions, and it's less likely to kink as you move about your yard. You can also attach it to the other end of the hose to make hand sprinklers easier to use. Best of all, it doesn't leak. You can find the Hose Swivel for about \$6 at hardware stores and home centers.

SPIKE CARLSEN, CONTRIBUTING EDITOR



EASY LIVING

Smart irrigation saves you \$\$\$

Do you know what's better than a sprinkler timer with a rain sensor? A smart timer that knows the exact rainfall in your area so it can adjust future schedules to avoid overwatering.

The Orbit B-hyve Wi-Fi irrigation timer (orbitonline.com) grabs local weather data via the internet and computes how long each zone should run to keep your plants and turf healthy while conserving water. You can also program it with a tablet or smartphone. It comes in two models: a six-zone unit for about \$100 and a 12-zone model for about \$120. They're available at home centers and online.

RICK MUSCOPLAT, CONTRIBUTING EDITOR

Easy Year-Round Property Cleanup



Take Your Weekends Back!

The Cyclone Rake hitches to any riding mower and turns weeks of hard work into a few easy hours. Its powerful engine-driven vacuum-mulcher lifts and pulverizes leftover leaves, pine straw and winter debris as you drive. In spring and summer, the Cyclone Rake helps to eliminate weed seeds and will make your overgrown lawns look like fairways.

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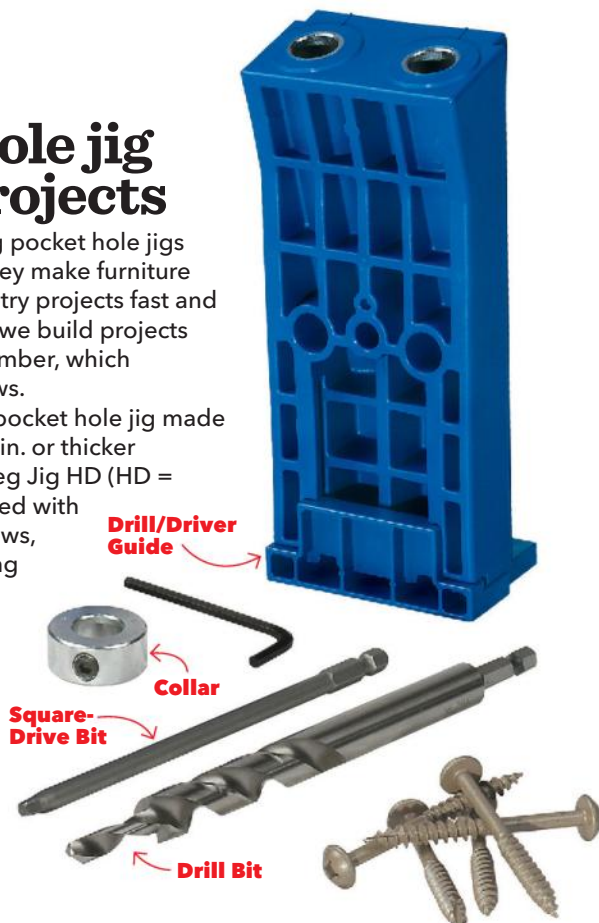


GREAT GADGET

Pocket hole jig for big projects

We love Kreg pocket hole jigs because they make furniture and cabinetry projects fast and easy. But sometimes we build projects out of thicker 2-by lumber, which requires bigger screws.

Kreg now offers a pocket hole jig made specifically for 1-1/2-in. or thicker lumber called the Kreg Jig HD (HD = heavy-duty). Combined with Kreg's larger HD screws, it's perfect for building bigger projects like workbenches and outdoor furniture. Kreg also makes weather-resistant screws (sold separately). The jig, which includes a drill bit and a square-drive bit, costs \$60 at kregtool.com.



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✓Yes



xNo



✓Yes



✓Yes



✓Yes

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TRASH-BAG DISPENSER

You can build a simple dispenser for your trash bags using 1/2-in. pipe and a few fittings. Screw a floor flange to the cabinet, thread in a 3-in.-long pipe nipple, and then thread a 90-degree elbow onto the nipple. Cut the vertical pipe so it's a bit longer than the width of the roll of bags. Thread the vertical piece into the elbow and slip on the roll.

TRAVIS LARSON



Easy apple cleanup

Bending over to pick up fallen fruit from my apple tree was hard on my back, but I found a solution that works really well. I bought a three-tine frog spear (\$3 at Cabela's) and fastened it to the end of a broom handle. Now I just spear the apples. If I'm careful, I can spear more than one at a time. Mashing small apples with my foot makes them easier to spear.

DAN ZAMBON





TIDY PAINT-CAN CLOSING

After you pour paint from a can, some paint always ends up in the can's rim. When you tap the lid back on, paint splatters everywhere. To avoid this, throw a rag over the lid before tapping it shut. Also, use a block of wood that spans the lid so you don't deform the can or lid with the hammer. Just tap the block a couple of times, give it a quarter turn and tap again.

JEROME COFFEL



NO-MESS REFILLS FOR SINK SOAP

Crawling under a kitchen sink to refill the soap dispenser was a hassle, so I tried filling it from above. But when I did, the soap formed an air-lock bubble and overflowed, creating a mess. That's when I came up with the idea of inserting a drinking straw in the bottle to relieve "bubble block." Now when I refill the dispenser, the air escapes through the straw and the soap stays where it belongs.

PAUL SNYDER



NO-TANGLE RATCHET STRAPS

Ratchet straps must have a self-tangling feature—they're always twisted up when I want to use them. I've tried bundling them with rubber bands, but the bands break

as they get old. So I bought a roll of stretch wrap and put it in a canvas bag with my ratchet straps. When I'm done using a strap, I bundle it up and wrap it tight with

a few rounds of stretch wrap. I fold back the end portion so it's easy to unwrap the next time. Now my straps are always ready to use.

MIKE COLEMAN

HANDY HINTS®



PALLET DOLLY

I had a truckload of lumber to transport down a long hallway to my shop, and I wasn't looking forward to carrying it an armload at a time. Then I noticed the pallet it was on. I didn't have a pallet jack, but I did have a set of casters. After I installed some reinforcement blocking, it took just a few minutes to attach a 4-in. caster to each corner of the pallet. Now it's my all-around heavy-stuff mover.

KEITH JONES



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SOFA STOPS

Felt pads for furniture feet do a good job of protecting my wood floors, but they turned out to be hard on my walls. After I put the protective pads on my sofa's feet, the sofa slid into the wall every time I sat down, leaving ugly scuff marks. To solve that problem, I screwed two doorstops on the back of the sofa legs at a height that hits the baseboard.

DWIGHT HALLOCK



HANDY PAINT-CAN OPENER

Every time I bought paint, I got a free paint-can opener, but I still could never find one when I needed it. Now, I grab a pair of pliers and open the loop on the handle just enough to slip it around the bail. No more hunting for openers—all my paint cans have one attached.

RAY ALVAREZ

Rockler and Earlex team up to design an HVLP Spray System for a professional quality finish at an affordable price!



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DIY Essentials

Our best tips for getting your project done right. By Brad Holden



5 MYTHS ABOUT MOLD

We're exposed to mold spores in the air every day, both indoors and out, and most of the time that's no cause for concern. But given moderate temperatures, a food source (nearly any building material) and moisture, mold can grow on almost any surface inside our homes. Left unchecked, that can mean real trouble. Mold can harm health and destroy the building materials it feasts on. Unfortunately, there's a lot of misinformation about mold and how to handle it. So let's separate myth from fact and look at solutions that work.



Myth #1

MOLD TESTING IS CRITICAL.

Surprisingly, this isn't the case. Testing gives you a snapshot of the quantity and type of mold present. But all types of mold (there are more than 100,000!) need to be removed, so it's not essential to identify the type. Also, there are no health-based safety standards for mold levels, so testing doesn't necessarily give valuable information, and it's expensive.

Myth #2

BLACK MOLD IS DEADLY. This is a popular misconception; toxicity isn't related to mold color. Some types of mold, given the right conditions, can produce mycotoxins. It's not well understood which molds produce these poisonous substances, and even the ones that can produce them don't always do so. And when they do, it doesn't amount to much.



Myth #3

YOU MUST CLEAN WITH BLEACH.

This isn't true either. Bleach *does* kill mold, but it's hard on your lungs, and it doesn't do a good job of removing mold. Scrubbing with soap and water is a safer and more effective way to eliminate mold from hard surfaces.

If porous surfaces like drywall or carpet get moldy, you can't clean them; you have to get rid of them. Bleach is necessary only if the moisture that caused the mold is from sewage. In this case, use 1/4 to 1/2 cup of bleach per gallon of water. Scrub the area and leave the bleach solution on for at least 30 minutes before rinsing it off. Thoroughly dry the area afterward.

Myth #4

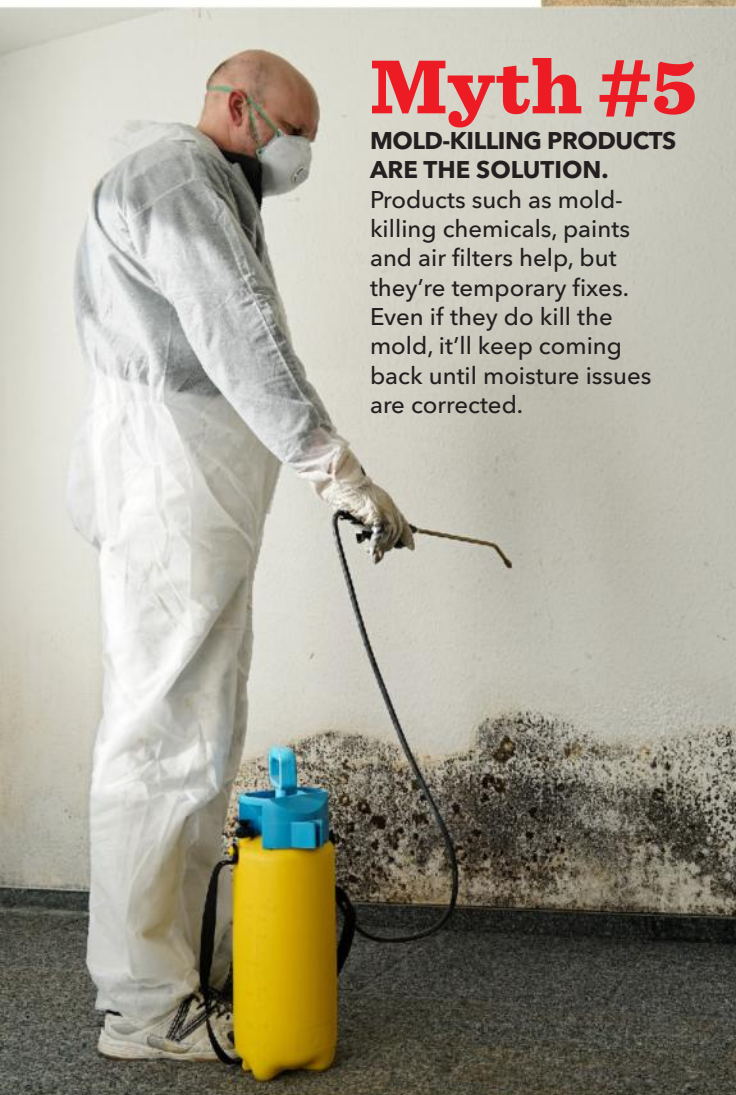
NO ODOR, NO MOLD. Wrong! Odor is one telltale indicator, but just because you can't smell mold doesn't mean it's not there. Actual inspection is always best. If you don't smell mold but suspect there may be a problem, check likely areas first. If you know of any roofing or plumbing leaks, that's a good starting point. Bathrooms, basements, crawl spaces and sink cabinets are other likely areas.



Myth #5

MOLD-KILLING PRODUCTS ARE THE SOLUTION.

Products such as mold-killing chemicals, paints and air filters help, but they're temporary fixes. Even if they do kill the mold, it'll keep coming back until moisture issues are corrected.



THE BOTTOM LINE: IT'S ALL ABOUT MOISTURE

Moisture is the essential ingredient for mold to thrive, and it can come from many sources. If an area has gotten wet for any reason, dry it within 24 to 48 hours, before mold has a chance to grow. The most common sources of moisture are plumbing leaks, roof leaks, wet basements, poor yard drainage, window condensation and high humidity. Search for each topic at familyhandyman.com to learn how to deal with it.

If porous surfaces such as carpet, drywall or ceiling tiles have gotten moldy, remove and replace them. Your house's humidity should be 30 to 60 percent from spring to fall, and about 20 to 30 percent in the winter. If it's high, use air conditioners or dehumidifiers. Use an exhaust fan ducted to the outside when you're cooking. Install and use a timer on your bathroom exhaust fan. It should run for at least 30 minutes after showers.

For in-depth information on mold and mildew removal, search for "mold and mildew" at familyhandyman.com.

MEET THE EXPERTS



Dan Tranter is the supervisor of the Indoor Air Unit at the Minnesota Department of Health. The Indoor Air Unit conducts research, education and outreach concerning indoor air quality, especially for radon, mold and carbon monoxide.



Kelly Smeltzer works as an indoor air quality specialist with the Minnesota Department of Health. She handles education and outreach on the topics of mold, carbon monoxide and healthy homes, along with enforcement of Minnesota rules pertaining to air quality in sports arenas.



WHEN SHOULD YOU CALL A PRO?

- If you can smell mold, but you can't find the mold or moisture problem.
- If there is so much mold that you can't remedy the problem easily.
- If there are highly susceptible individuals in your home. This could include those with respiratory conditions such as severe asthma or allergies, and those with a weakened immune system caused by HIV, chemotherapy or an organ transplant. Young children and elderly persons may also be more susceptible to mold-related health issues.
- If there are other hazardous materials present, like asbestos or lead, that will be disturbed or removed along with the mold. Hire a contractor who is licensed for those hazards.
- If moisture has created structural problems. Consult a qualified contractor to do the repairs or a structural engineer to advise you on what needs to be done.

IF YOU CALL A PRO, DO YOUR HOMEWORK

- Get several quotes.
- Ask for references.
- Ask about their experience, accreditation and training, particularly in indoor air quality.
- Ask if they hold any professional certifications or licenses. Certifications are voluntary, but they're a good indication that a contractor has basic knowledge and participates in continuing education. A few states require licensing for mold testing and remediation contractors, but most don't, so check with your state or local government.
- Ask if they use accredited labs and testing equipment. Lab accreditation is typically done through the American Industrial Hygiene Association and/or the American Association for Laboratory Accreditation.
- Ask if the testing company is also involved with the remediation process; that could be a conflict of interest.

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A dream kitchen should be a luxury that everyone can afford – a complete kitchen with a beautiful island, all the storage you'll need, and unique solutions that fit your budget. Because no matter what you do, who you are, or how much you make, you deserve to make the dream yours.



SEKTION kitchen with **VOXTORP** light beige high-gloss drawer fronts, **VOXTORP** walnut effect doors, drawer fronts and **MAXIMERA** soft-closing drawers. **SEKTION** cabinet frames in white melamine foil. **VOXTORP** doors/drawers fronts in high-gloss foil finish and foil finish. **MAXIMERA** drawer in powder-coated steel and melamine foil. Shown with **PERSONLIG** quartz frosty carrina countertop with eased edges. [IKEA-USA.com/kitchen](https://www.ikea-usa.com/kitchen)

Requires assembly. *The total price includes cabinets, fronts, drawers, door dampers, interior shelving, hinges, toe kicks, legs, and cover panels. Your choice of countertops, sinks, faucets, knobs and handles, appliances, and lighting sold separately. See IKEA store for limited warranty, country of origin and 10'x10' details. Valid in US stores only.



SEKTION / VOXTORP
kitchen

\$3399*

*Based on a 10'×10' kitchen

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Best ProTips

Expert advice from the job site. By Mark Petersen

INSTALL AN IRRIGATION SYSTEM

Installing an irrigation system is a great way to keep a lawn green through even the doggiest days of summer. We spent a day with pro installers, who taught us how to pull pipe, make solid connections faster and get it done safely. The result: a well designed irrigation system that sips water instead of guzzling it.

We don't show how to connect an irrigation system to a home's water supply or install a vacuum breaker/backflow preventer in this story. This crew hires a licensed plumber for those steps.



MEET THE EXPERT: Brian Larson is the owner of Northway Irrigation in Ham Lake, MN. Northway has been installing residential and commercial irrigation systems for more than 30 years.

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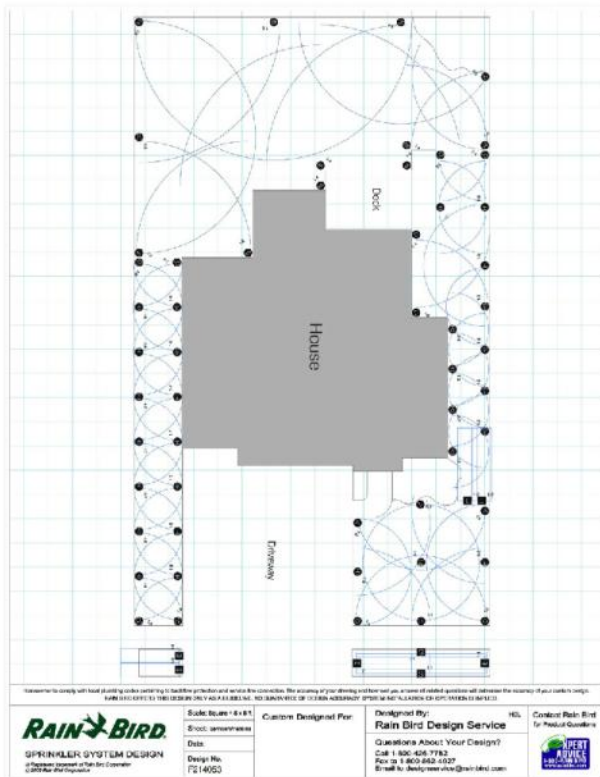
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A good plan saves water

It takes a lot of know-how to figure out how many zones to install and which sprinkler head goes where. A poorly designed system will waste water—a lot of it! Luckily, irrigation product manufacturers such as Hunter, Toro and Rain Bird have extensive literature online to help. Rain Bird will even design your layout for you if you send in the measurements of the property.



Remove sod first

Slice off the sod before you dig a hole so it can be put back into place. If you do it right, the yard should show very few signs of your labor—besides the greener grass, of course.



Pull the pipes with a vibratory plow

Pulling polyethylene pipe through the ground is faster and easier than digging trenches and doesn't create a huge mess. Here are some things to consider when pulling pipes:

- Avoid tree roots. (To get an idea of how far they extend from the trunk, consider that the root structure is often the same size as the canopy.)
- Shoot for a depth of about 10 in.
- Feed the pipe into the hole as you pull.
- Avoid pulling pipes that are spliced (they could come apart underground).
- If you're renting a plow, pull all the pipes right away and return the machine. This may allow you to rent for only a half day and save money.
- A vibratory plow may not work in super-compacted soil. You may need a trencher instead. A local rental center should know what types of soil you are likely to encounter.
- **Caution:** Always call 811 to have the utilities located before you dig!



Hand-dig around utilities

No matter how deep you *think* a utility pipe or wire is buried, always hand-dig over and around those areas.

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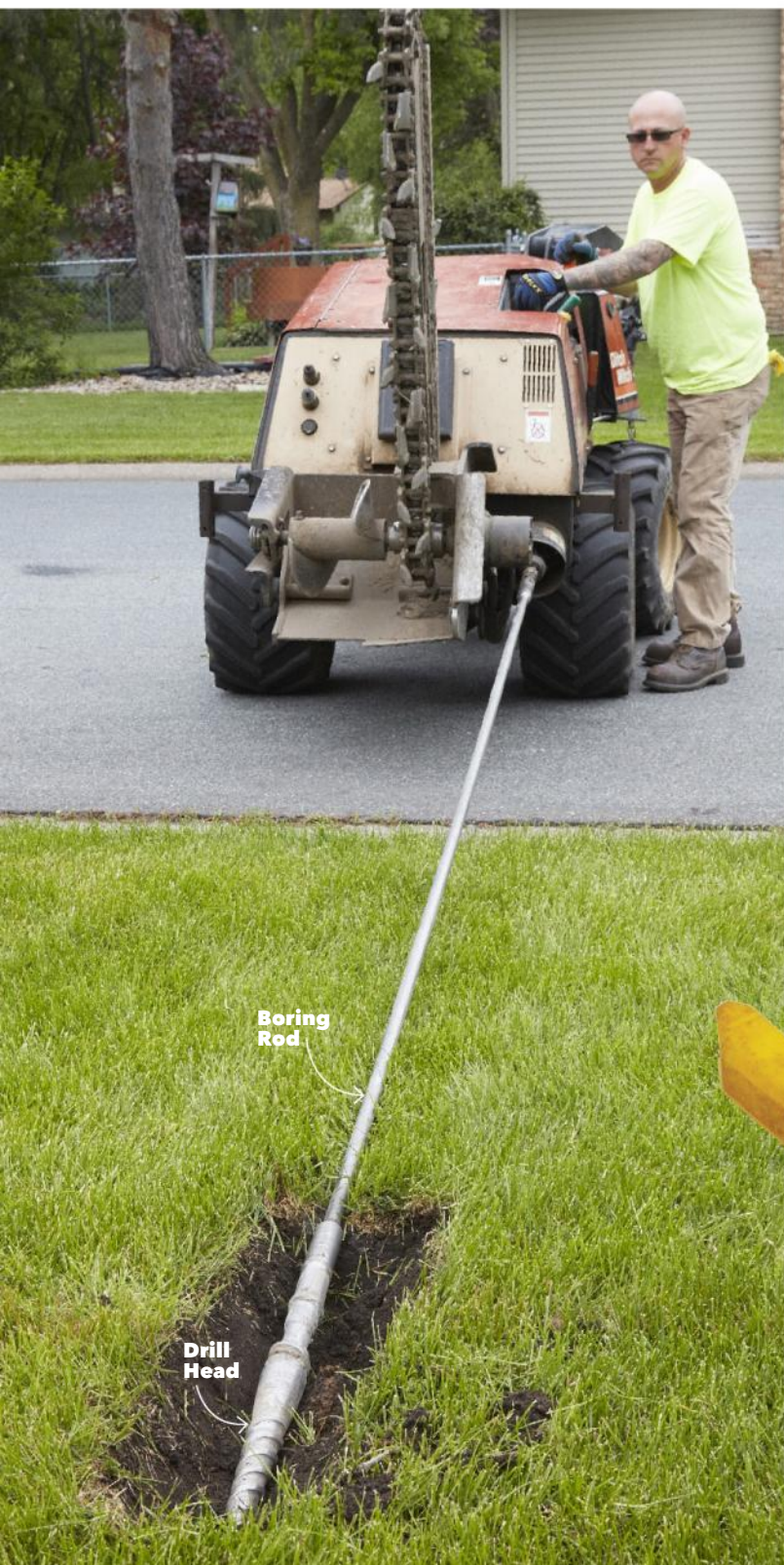


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BEST PRO TIPS



Bore under obstructions

Some vibratory plows/trenchers are capable of horizontal boring as well. If you plan to rent a plow and have to dig under a sidewalk or driveway, you might as well rent the boring rods and the drill head at the same time.



Keep pipes clean

Dirt and other debris that get into the pipes will plug the heads. Keep all that out by covering the ends with duct tape. Besides dirt and rocks, these pros have found the occasional snake and frog clogging up the works...surprise! If you know you've kicked dirt down in the pipe, flush the line before installing that head.



Don't cut pipes with a saw

Cutting pipes with a saw can leave behind plastic shavings that could clog the sprinkler heads. An inexpensive poly pipe cutter works great. If you have the option, pick a bright-colored one that will be easier to spot in the grass. A pipe cutter like this one costs less than \$10 at home centers.

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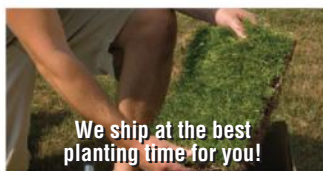
Guaranteed to grow new green shoots within 45-60 days or we'll replace it FREE – for up to 1 year – just call us. We ONLY ship you living genuine Amazoy Zoysia grass harvested direct from our farms. Easy planting and watering instructions are included with each order. Every Reorder assumes success of previous orders (plantings), voiding any previous guarantees, but initiating a new one-year guarantee.

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No more pulling out weeds by hand or weeds sprouting up all over your lawn. Zoysia Plugs spread into a dense, plush, deep-rooted, established lawn that drives out unwanted growth and stops crabgrass and most summer weeds from germinating.

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500	100	4	\$50.00	\$15.00	33%	60	15	5	\$90.00	\$20.00	34%
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BEST PRO TIPS



Double-clamp main lines

You can secure pipes to fittings quickly and easily with crimp clamps, but sometimes they can ever so slightly squish the pipe into an oval shape, creating a less-than-perfect connection. Main lines (the lines leading to the zone valves) are always pressurized, so install two crimp rings on each side of each fitting connection for extra protection against leaks. Stagger the ears on the two clamps to offset any pipe distortions.



Install heads with swing pipe

Install a section of "swing pipe," often called "funny pipe," between the end of the poly pipe and the sprinkler head. Because funny pipe is flexible, you can much more easily position the head exactly where it needs to be. Funny pipe also allows the head to move a bit in case it's run over by a vehicle or pushed around by the frozen ground. When a head is connected directly to the rigid poly pipe, any movement could crack the fitting that connects them.



Cut out kinks

A kink in poly pipe creates a weak spot. Don't try to straighten the pipe. Instead, cut out the kink and splice two pipes together with a coupler. If you must pull a pipe that has been spliced, add a couple extra clamps to the fitting and hook up the longest of the spliced sections to the plow.



**Bigger
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“My friends all hate their cell phones... I love mine!” Here’s why.

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Leave room for the pipe

Overcut the access holes in the valve box to provide extra room for the pipes. If the pipes fit snugly, they could be crushed if the box is run over by a lawn tractor or other vehicle when the ground is soft or saturated.



Self-tapping fittings are fast and easy

When you pull pipes underground instead of trenching, traditional tee fittings can be difficult to install. The best way to tap heads directly into a continuous run of pipe is to install self-tapping fittings (saddles). Just snap the saddle onto the pipe and screw in the spike, which taps into the pipe. Hook up your funny pipe to the saddle and you're good to go.



Smart controllers save water

According to the EPA, residential outdoor water use in the United States accounts for nearly 9 billion gallons of water each day, mostly for landscape irrigation. Experts estimate that as much as 50 percent of this water is wasted through overwatering caused by inefficiencies in irrigation methods and systems.

Traditional controllers turn each zone on and off for a predetermined amount of time. A rain gauge connected to a controller will monitor recent rainfall and shut down the system in the middle of or shortly after a rain event. That's helpful, but there are controllers and sensors available now that can track temperatures, sunlight and other seasonal conditions, and will adjust the watering schedule accordingly. A well-planned design along with a properly functioning smart controller can save a couple hundred gallons of water per day!

The one shown here, made by Rain Bird, connects to a home Wi-Fi, allowing the homeowner to control it or get updated on a smartphone.

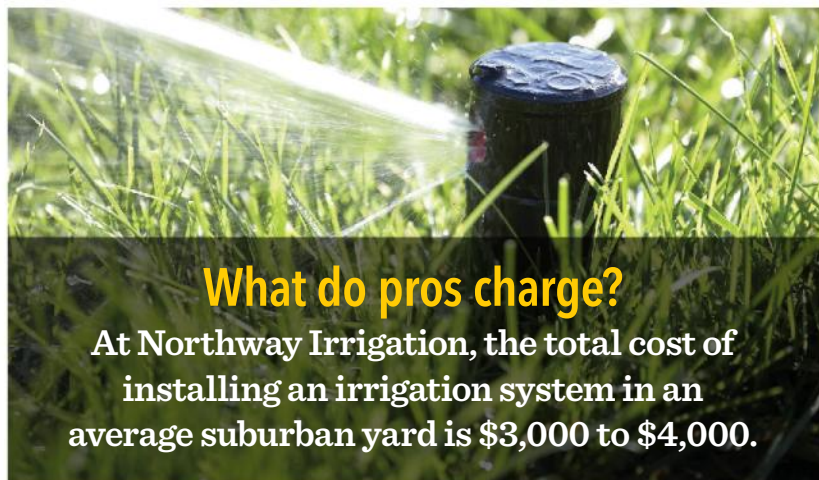


**Grease-Filled
Connectors**



Protect wires from the elements

The wire connections in the valve box require connectors approved for direct burial. Basically tubes filled with dielectric grease, the ones shown are made by NorthStar Industries.



What do pros charge?

At Northway Irrigation, the total cost of installing an irrigation system in an average suburban yard is \$3,000 to \$4,000.



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built-to-last VIKING LONG TABLE

**Big enough for the whole clan
and costs less than \$200!
by Spike Carlsen**



MEET THE EXPERT

Spike Carlsen is a former editor at *The Family Handyman*. He's currently working on his sixth book, this one on how to build kids' furniture. When he's not making sawdust, you can find him—and his ever-expanding family—feasting around his original Viking table creation in Stillwater, MN.



When the Vikings of yore built something—a longboat, a lodge, even a drinking horn—it was sturdy and simple, functional yet attractive. This table fits that mold. It's big, rock-solid and buildable with basic tools, yet it has a certain elegance to it.

This style of table is known as a drawbore trestle. The “trestle” is the stretcher that connects the legs, and “drawbore” refers to the “bored” mortises and tenons that “draw” the legs and trestle tightly together to create a stable base.

You can easily shorten (and lighten) your table by modifying the dimensions given. The benches that accompany this table are built using the same template and same basic procedures. To find out how to build them, search for “Viking benches” at familyhandyman.com.

WHAT IT TAKES

TIME
25 to 30
hours

COST
\$180

SKILL LEVEL
Intermediate

TOOLS Circular saw, jigsaw, router, belt sander, drill, clamps and basic hand tools



It's "knockdownable"!

The table, built as shown, is enormous—long, wide and weighty. But by removing two wedges and eight screws, you can separate the legs, tabletop and trestle so you can store the table for the winter or move it to a different location.

Pick the right wood

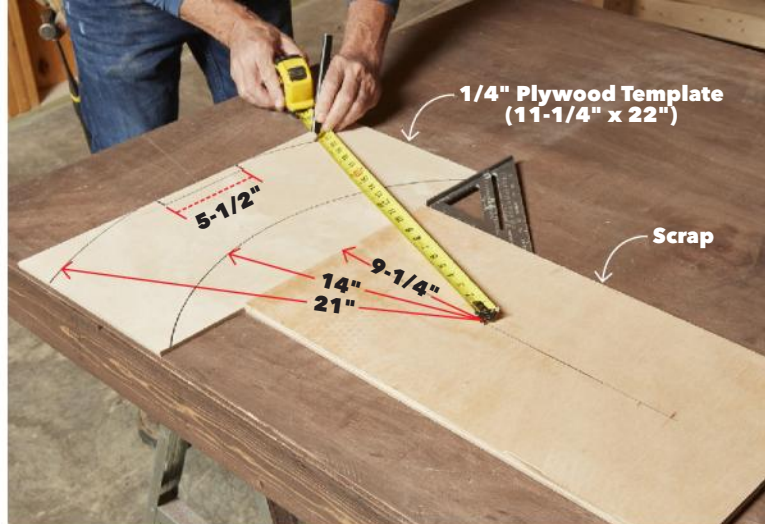
If you're building this table for inside use, you can use everyday dimensional lumber or more expensive hardwoods. But if it will be used outside, consider one of the following weather-resistant options:

CEDAR, REDWOOD OR CYPRESS.

One of these "premium" exterior woods is most likely available in your area. Select boards with the most heartwood—the darker inside part of the tree, which is more durable than the lighter-colored sapwood. The downside? These woods can be wickedly expensive and, in some cases, soft.

TREATED LUMBER. It's moderately priced and stands up well to weather, but it's often wet from the treatment process, which means it's more likely to shrink and twist, and less likely to glue up well. It's also difficult to apply a good-looking finish until the wood fully dries.

DOUGLAS FIR. This is the wood we used. It's more expensive than the more widely available "standard" dimensional lumber—often labeled H-F, S-P-F or "white wood"—but cheaper than the premium woods. It's about 20 percent harder, and stronger, heavier and more moisture resistant than standard lumber. Not all home centers and lumberyards stock Douglas fir; look for the "Doug Fir" or "DF" stamp. If in doubt, ask. In our area, Lowe's and contractor lumberyards carry Douglas fir.



1. MAKE THE LEG TEMPLATE

Set a scrap of plywood against the template. Drive a screw 9-1/4 in. from the end of the scrap and use that screw as a pivot point for your tape measure. Then swing the two arcs to create the leg shape.



2. GLUE UP THE LEG "SANDWICH"

Trace the leg shape onto two 22-in. 2x12s, lightly dampen the bottom piece, then apply polyurethane glue. Use a plastic putty knife to spread the glue slightly beyond the edges of the layout lines and across the main body of the leg.



3. CLAMP THE LEG BLANKS TOGETHER

Line up the "mortise" edges of the boards, then drive a few drywall screws into the scrap wood to keep the boards aligned. Fasten clamps around the perimeter to force the boards tightly together.



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- 3. Go to www.sunsetter.com**
- 4. By Mail:** SunSetter Products, Dept. 34159
184 Charles Street, Malden, MA 02148. Be sure to include your complete mailing address and email address.

Figure A
Viking Long Table

OVERALL DIMENSIONS:
110-1/2" Long x 40-3/4" Wide x 28-3/4" Tall

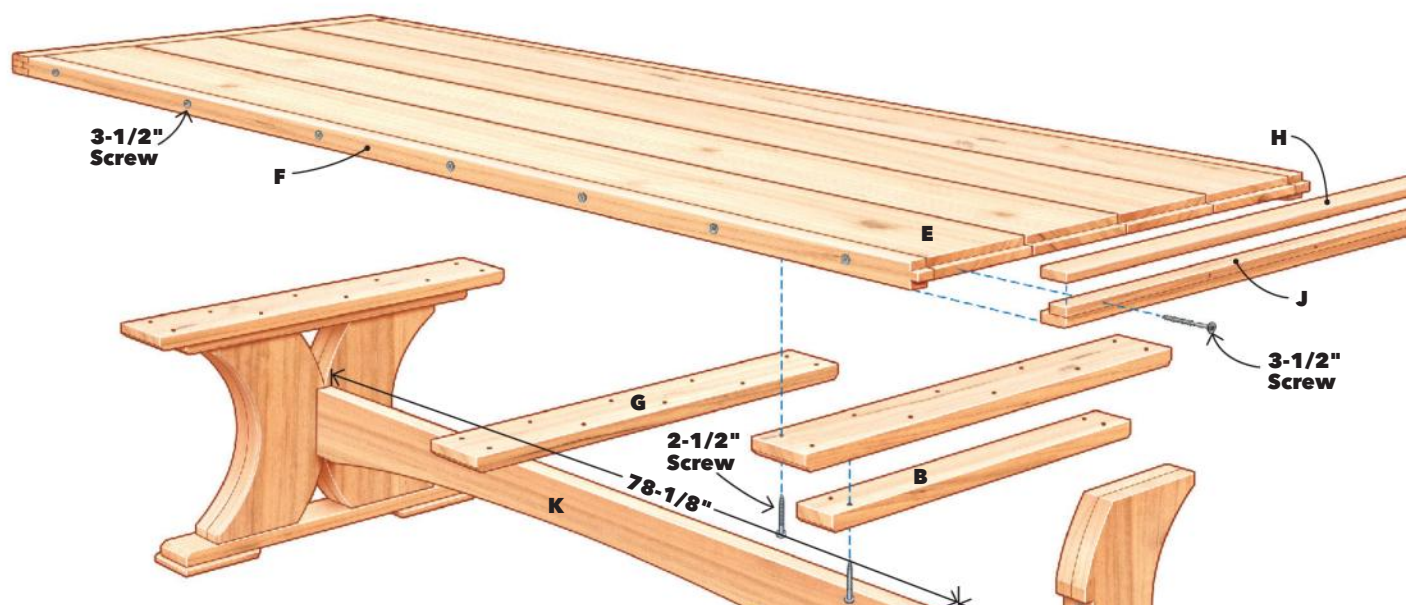
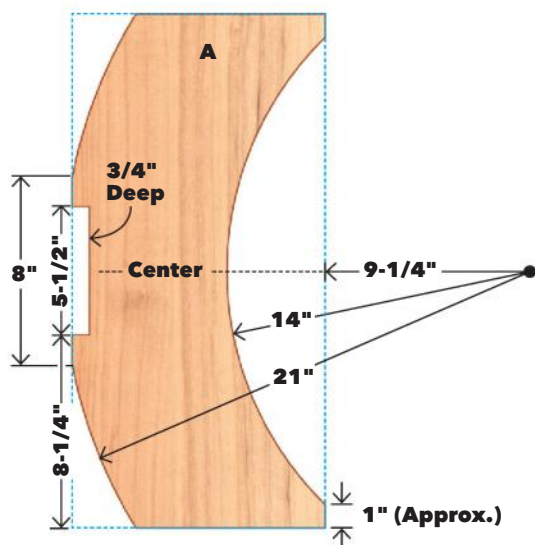


Figure B Leg



You can make this table longer or shorter just by altering the lengths of parts E, F and K.

CUTTING LIST

KEY	QTY.	SIZE	PART
A	8	1-1/2" x 11-1/4" x 22"	Legs
B	2	1-1/2" x 3-1/2" x 30"	Top leg plates
C	2	1-1/2" x 3-1/2" x 30"	Bottom leg plates
D	4	3/4" x 4" x 8"	Feet (white oak)
E	4	1-1/2" x 9-1/4" x 108"	Top boards
F	2	1-1/2" x 2-1/4" x 108"	Edge boards
G	3	1-1/2" x 5-1/2" x 37"	Tabletop braces
H	2	3/4" x 2" x 40-3/4"	Outside breadboard ends (white oak)
J	1	3/4" x 1-1/4" x 40-3/4"	Middle breadboard end (white oak)
K	1	1-1/2" x 7-1/2" x 92-1/8"	Stretcher
L	2	3/4" x 2-1/2" x 7"	Wedges (white oak)

MATERIALS LIST

ITEM	QTY.
2x12 x 8' Douglas fir	2
2x10 x 10' Douglas fir	4
2x8 x 8' Douglas fir	1
3/4" x 5-1/2" x 4' white oak	3
2x6 x 10' Douglas fir	2
2x4 x 10' Douglas fir	1
2-1/2" exterior deck screws	1 lb.
2-1/2" exterior washer-head screws	2 lbs.
3-1/2" exterior washer-head screws	2 lbs.
Construction adhesive	1 tube

We used white oak for the feet, the breadboard ends and the wedges. Other woods would work fine, but we liked the extra strength, hardness and contrast the white oak provided in these critical pieces. Red oak, the type you'll often find at home centers, isn't a good substitute, since it's much more prone to rot. You can find white oak at specialty woodworking stores and online.

How has the Douglas fir table I built four years ago stood up? We give it a quick sanding and a coat of Cabot Australian Timber Oil every spring and cover it with a tarp during the tough Minnesota winters. The table remains as beautiful as it was on the day it was made.

Create the legs

Take your time at the lumberyard selecting flat, straight boards free of split ends, twists, cupping and loose knots—you'll spare yourself a lot of clamping and cussing down the road. If you have trouble finding perfect 2x12s, purchase an extra board—or longer boards and cut around the defects.

Cut your boards into eight 22-in.-long pieces; make sure the ends are square. Pair up your boards so when one is laid atop the other, there's little or no gap along the ends and edges. If you flip or rotate the boards, sometimes you'll find the perfect fit. Try to have any defects fall in the areas of the wood you'll be cutting away as you form the legs.

Mark out your leg template onto 1/4-in. plywood as shown in **Photo 1**. Cut just outside the line with a fine-tooth jigsaw blade, then use a belt sander to sand right up to the line. Use your template to trace the leg shape onto two leg sections (A). Lightly dampen the bottom piece—polyurethane glue needs moisture to work—then apply healthy squiggles of the glue across the main body of the leg (**Photo 2**). Use a plastic putty knife to spread the glue slightly past the edges of your template marks. Polyurethane glue is waterproof, and tightly glued seams mean less chance of moisture working its way between the boards.

Place the top board over your glued board, taking care to even up the edges. Install two or three screws in the waste area (**Photo 3**) to keep the pieces aligned and then use clamps—lots of them—along all the edges. Drive



4. CUT THE LEGS TO SHAPE

Make a series of relief cuts along the “concave” side of the leg, then use a jigsaw with a coarse blade (or band saw) to cut the curves. Make a series of relief cuts for the stretcher mortise, then use a jigsaw and chisel to make the opening.



5. SAND THE LEGS AND ROUT THE EDGES

Clamp the legs to your work surface, then use a belt sander to smooth the curves and eliminate blade marks. Use a router with a 1/2-in. round-over bit to soften the curved edges, but leave the top, bottom and stretcher areas square.



6. CREATE THE LEG ASSEMBLIES

Set the arches on 1/4-in. spacers, butt the arches together, then dry-fit the top and bottom plates. Check the stretcher opening with a 2x6 to make sure the tenon will fit. Finally, apply construction adhesive to the leg ends and clamp and screw the parts together.



7. CUT THE TONGUES

Position the top and edge boards “good side up,” then, with your circular saw set $\frac{3}{4}$ in. deep, make a series of cuts starting $\frac{3}{4}$ in. from the end. Make one of these cuts across the very end to guide your chisel. Make these tongue cuts on both sides of the edge boards.



8. BUILD THE BREADBOARD ENDS

Use waterproof glue and clamps to build the three-part breadboard ends. Make sure the center trough is $\frac{3}{4}$ x $\frac{3}{4}$ in. to accommodate the tongues of the top boards.



9. ASSEMBLE THE TOP

Position the top and edge boards “good side down,” then screw the braces and breadboard ends to the top boards.

additional screws into the waste area to help draw the pieces tightly together. The glue will foam as it goes to work. Keep your boards clamped together at least two hours or overnight for good measure. Create three more leg blanks this way.

Cut out the legs. A jigsaw with a long, coarse blade (**Photo 4**) works fine, but a band saw works better, so use one if you have access to it. Whichever tool you use, make a series of “relief” cuts as shown. These allow you to remove waste material as you cut. They also allow your blade to get back on track if it wanders and begins making angled cuts, which jigsaws in particular are prone to do. If you have a jigsaw with reciprocating action, set it at zero; it will cut slower, but your blade will wander less.

Next use a belt sander to smooth and true up the curved sides (**Photo 5**). Begin with a coarse belt, then progress to finer grits. If you have access to a benchtop belt sander or spindle sander, use it; you’ll get results faster.

Use a router with a $\frac{1}{2}$ -in. round-over bit to soften the edges of the curved parts. Don’t rout the tops and bottoms of the legs or the flat area where the mortise cutout will be.

Position two leg sections next to each other (**Photo 6**) and check to make sure the mortise cutout (where the stretcher tenon will go) can accommodate a 2x6 test piece. It’s easier to enlarge these areas now, before joining the legs. Set the legs on $\frac{1}{4}$ -in. spacers (so they’ll be centered on the 2x4 top and bottom plates). Then apply construction adhesive to the ends to add a layer of moisture protection, and cinch the leg sections tightly together and to the 2x4 plates (B, C) with clamps. Secure the legs to the plates using 3- $\frac{1}{2}$ -in. exterior screws. Repeat for the other leg assembly.

Cut the feet (D) to size and shape, then secure them with glue and screws to the bottom plates (**Photo 10**).

Build the breadboard ends and tabletop

“Breadboard” ends have been used by woodworkers for centuries—and for good reason:

- They help keep the ends of the tabletop boards flat and aligned.
- They help protect the end grain of the boards from moisture and wear.

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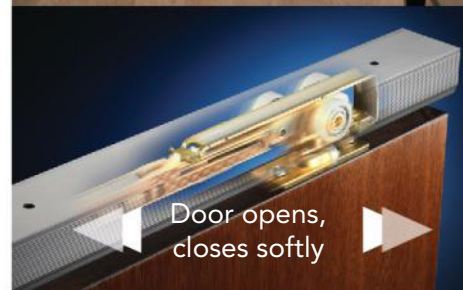
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10. TAKE MEASUREMENTS FOR THE STRETCHER

Position the leg assemblies, making sure they're square to the tabletop. Take inside-to-inside and outside-to-outside measurements to determine the exact measurements you need for the stretcher.

- They allow the top boards to shrink and expand more freely without cracking.

- They provide a smooth edge for your tummy to rest against.

The 2-1/4-in.-wide boards along the long edges give the tabletop more mass to match the heft of the legs. Rip your two 2-1/4-in.-wide edge boards (F) from a 2x6. Cut these and your four 2x10 top boards (E) to length. To create the "tongues" that slide into the breadboard ends, set your circular saw to cut 3/4 in. deep, then make one cut 3/4 in. from each end of each board (**Photo 7**), another cut right along the end, and then a couple more cuts in between. Place your chisel along the end cut and use it as a guide to remove the waste material. When you're done, each end will have a 3/4-in. x 3/4-in. tongue. Make the same cuts on the top and bottom of the edge boards (F) as shown.

Next, make your board ends (H, J) as shown in **Photo 8**; they're essentially three-board sandwiches with the middle board inset 3/4 in. to accommodate the tongues you've created. We made ours from white oak for strength, appearance and durability, but you can make yours from the same

wood as your table. Be sure to use waterproof glue. Rout the outer edges and cut the breadboard ends to length; make them 1/2 in. longer than the width of the finished tabletop to accommodate board movement.

Place your two edge boards (F) and four tabletop boards (E) on your work surface upside down. Space your top boards 1/8 in. apart using drywall nails or shims. Even up the ends of the six boards, then tap the breadboard ends into place. Position the braces (G) and make sure everything is tight and square (**Photo 9**). Then drill 3/8-in.-diameter holes through the support braces and secure the braces to the four tabletop boards using 1/4-in. x 2-1/2-in. washer-head screws. Note: The slightly oversize holes give the boards wiggle room to shrink and expand to help prevent cracking. Predrill holes in the breadboard ends—one centered on each of the four wide boards—and secure them with 3-1/2-in. washer-head screws. Finally, drill holes along the center of the edge boards (F); angle them slightly toward the top of the table so the screws will have plenty of meat to bite into, then drive home the 3-1/2-in. washer-head screws.

Assemble the table

Position the two leg assemblies as shown in **Photo 10**. Make sure they're square to the tabletop, then measure the distance between them. This will give you the dimensions you need to create your stretcher. Note that we provide an exact stretcher length in the Cutting List, but your length will most likely differ.

There are a few key measurements you need to get right in order for your stretcher and drawbore wedges (**Photo 11**) to do their jobs.

- The shoulder measurement. This is the distance between leg assemblies. This distance is key because the shoulders hold the leg assemblies the right distance apart and "wiggle-proof" the table.

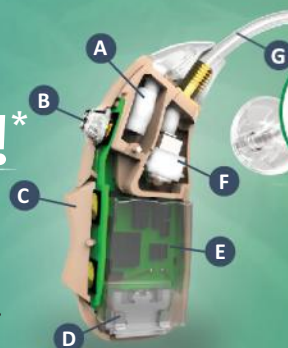
- The tenon length and width. The tenon extends 7 in. past the shoulder and should be 5-1/2 in. wide.

- The mortise cutout. The cutout is centered on the tenon and is 5/8 in. wide and 2-1/2 in. long. The edge of the mortise near the outside of the leg should be inset into the leg by about 1/8 in. so that when the wedge is installed, it will draw the shoulder tightly against the leg. When done properly, this joint is amazingly strong, so take your time

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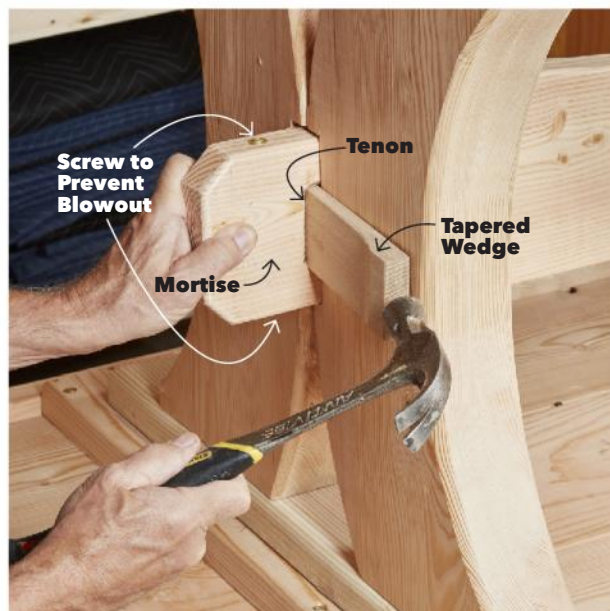
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11. LAY OUT AND CUT THE STRETCHER

Use your measurements to lay out the overall length of the stretcher and establish the positions of the shoulders, tenons and mortises. Bend a flexible piece of wood and trace the edge to create the curved lower edge. Use a jigsaw to cut out all the parts, then rout the edges.



12. INSTALL THE STRETCHER AND WEDGE IT TIGHT

Slide the tenons through the leg openings, then tap wedges into the mortises to pull the shoulders tightly against the legs. The long screw at the end of the tenon helps prevent the wedge from splitting out the end of the stretcher.



13. SCREW THE LEG ASSEMBLIES TO THE BRACES

Center the leg assemblies on the end braces. Drill oversize holes through the leg plates, then secure the legs to the top with washer-head screws.

to get it sized and positioned just right.

With all of this in mind, make the stretcher (**Photo 11**). Once you've marked the key stretcher length, tenon and mortise measurements, bend a thin piece of wood to create the arched bottom of the stretcher. Use a jigsaw to cut out the parts. Drill 5/8-in. starter holes in each end of the 2-1/2-in.-long mortises to give your jigsaw an entry point.

To make your wedges (L), first cut a 3/4-in. board 24 in. long, then rip it 2-1/4 in. wide. Use a belt sander to taper each end of the board, then cut them to their final 7-in. length and soften the edges.

Separate the legs and install the stretcher. Drive the wedges into place as shown in **Photo 12**. The screw driven through the end of the tenon helps reinforce it to prevent the wedge from blowing out the end of the tenon when driven in tightly.

Once the stretcher and legs are locked together, secure the leg assemblies to the tabletop crosspieces (**Photo 13**). Sand and smooth out any rough areas, then apply your exterior finish.



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EASIER PAVER PATIOS

Plastic panels
eliminate TONS of labor
By Jeff Gorton

A traditional base for a paver or stone patio is a 6-in.-deep layer of compacted gravel. For a typical 10 x 12-ft. patio, that means carting away about 2-1/2 tons of soil, and hauling in the same amount of gravel. But there's an easier way. Let plastic panels take the place of the gravel base. For that same patio, you would need only 24 paver base panels weighing a total of about 30 lbs. to replace the 2-1/2 tons of gravel.



LAY PANELS ON LEVELED SAND

After removing a few inches of soil and compacting the site, spread about 3/4 in. of sand over the soil and level it. Then place the paver base panels over the sand, staggering them to avoid continuous seams.



INSTALL THE PAVERS

Install the pavers as you would over a conventional gravel base. An advantage of this system is that the screeded sand is protected by the panels, so you're unlikely to mess it up as you work.

WHAT IT IS AND HOW IT WORKS

Paver base panels are made from lightweight high-density polypropylene. The panels typically have tongue-and-groove or shiplap edges to keep the panel edges flush with one another.

You may wonder how a thin plastic mat can effectively replace a 6-in.-deep layer of compacted gravel. The answer is that the panels spread out the load, so the weight of a person walking on the patio is distributed more widely. Distributing the load puts less pressure on the soil and prevents the paver bricks from becoming uneven.

The panels have the added advantage of providing an insulating layer that reduces problems caused by soil that thaws and refreezes. And finally, paver base panels have built-in channels and holes to drain water to the sand layer below.

Paver base products have been around for only a few years, so it's uncertain how they'll perform long-term. But results are good so far. Studies from independent engineers have concluded that the panels are equivalent to a compacted gravel base for load distribution and superior for thermal resistance.



Benefits of a Panel Base

- Requires less digging.
- Eliminates heavy gravel fill.
- Saves time.
- Reduces the cost of digging and hauling.
- Prevents damage to the landscaping caused by excavating equipment.
- Allows patio installations in fenced areas or areas with limited access.
- Protects the screeded sand while you're installing pavers.

PAVER BASE PANEL

Lightweight panels spread the load and eliminate the need for a thick gravel base.

SAND

A thin layer of screeded sand provides a level platform for the paver panels.

LANDSCAPE FABRIC

Nonwoven fabric allows drainage while preventing the sand from mixing with the soil.

5 Things You'll Need

As with any other outdoor paving project, the first steps are to plan the size and mark out the area with paint, a garden hose or string. Then measure the width and length and figure out how much material you'll need. Plan to build the patio base 1 ft. wider and longer than the size of the finished patio so that it will extend 6 in. beyond the paving on all sides.

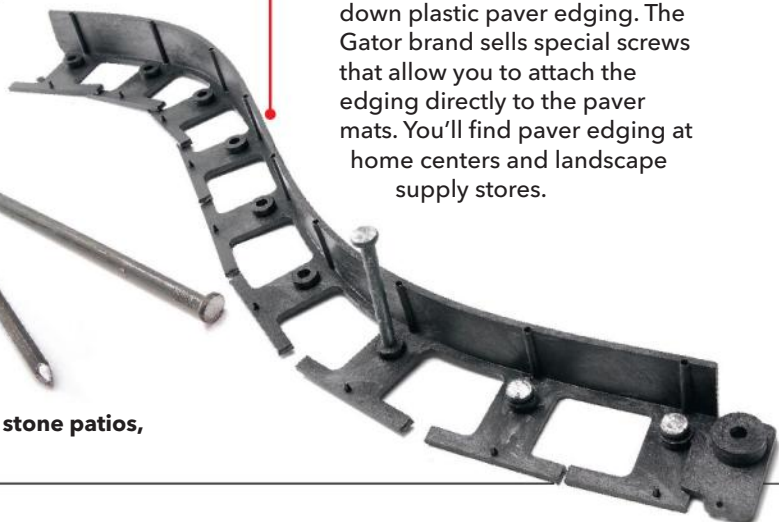


LANDSCAPE FABRIC: The purpose of the landscape fabric is to prevent the sand from mixing in with the soil. But it's important to use a nonwoven fabric. Woven landscape fabric isn't very permeable and can act like a swimming pool liner, trapping water under your patio. Also look for fabric with at least a 20-year life span.

SAND: You'll need a layer of sand that's an average depth of 3/4 in. Buy all-purpose or fill sand, not sandbox sand. It's too fine. If you're buying bags of sand, figure about one 50-lb. bag for every 8 sq. ft. of patio.

PAVER PANELS: Divide the square footage of your patio by the square-foot coverage of each panel to determine the number of panels you'll need. Add about 20 percent if your patio is an irregular shape.

PAVER EDGING: You'll need a way to hold the paver bricks in place along the edges of the patio. The most common and convenient method is to stake down plastic paver edging. The Gator brand sells special screws that allow you to attach the edging directly to the paver mats. You'll find paver edging at home centers and landscape supply stores.



FOR MORE INFORMATION on building paver or stone patios, search for "patios" at familyhandyman.com.



SAND OR POLYMERIC JOINT SAND: Some manufacturers specify filling the joints between pavers with polymeric sand. This helps lock the pavers together and provides a maintenance-free joint that sheds water well. If you use polymeric sand in the joints, follow the installation instructions carefully to avoid discoloring the paver surface and to prevent problems.



IN ADDITION TO THESE FIVE MATERIALS, you'll need digging equipment like wheelbarrows and shovels, a place to put the excess sod and soil, a rented plate compactor, and in most cases, a rented brick saw. You can speed up sod removal by renting a sod cutter. And if you rent a trash bin, you can get rid of soil without making trips to the landfill.

Building with paver base panels

Paver base panels don't eliminate the need for careful site preparation. You'll have to remove grass or other vegetation and skim off 2 to 4 in. of soil. You also must remove soil evenly, leaving a flat surface because there's no thick layer of gravel to make up for uneven ground. After digging and grading, there shouldn't be more than about 1/2-in. variation in flatness over the area.

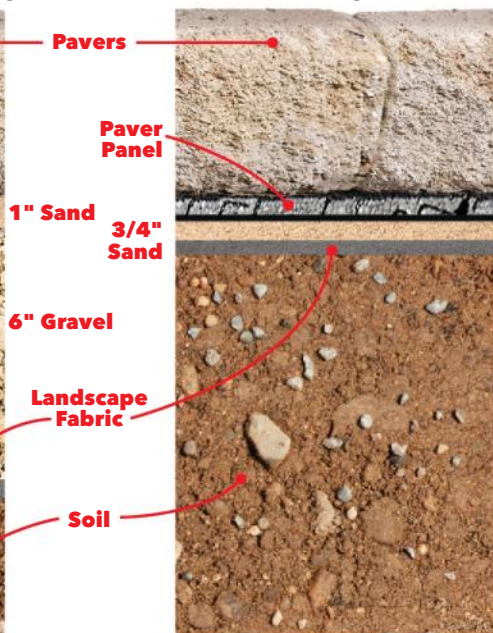
Since there is no gravel base, it's important to use a plate compactor to tamp down the soil before covering it with landscape fabric and a layer of sand. The sand layer must be screeded to provide a flat, properly sloped surface for the paver base panels.

Lay the paver base panels over the sand bed. The lightweight, easy-to-cut panels make this a quick task. Follow the manufacturer's instructions for offsetting the panels and for edge details. If you're planning to install stones that vary in thickness, you'll have to put a layer of sand over the panels to allow leveling of the stones.

TRADITIONAL PATIO BASE



PAVER BASE PANEL



Cost and availability

Some paver base panels are available at home centers; others are distributed through landscape supply stores. The cost of the panels ranges from \$2 to \$3 per square foot. There are several brands of paver base panels, including:

alliancegator.com/products/gator-base
brockpaverbase.com
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LIMIT 4 per household. Good 10/1/11*

CHICAGO = **ELECTRIC** **POWER TOOLS** **SCISSOR** **SUPER COUPON**

10" SLIDING COMPOUND MITER SAW • Powerful 15 amp motor

Customer Rating **★★★★★**

NOW \$84.99

~~\$114.99~~

SAVE \$114 COMPARE TO **KOBALT \$199**

MODEL: SAG325TUM

ITEM 61971/61972/98199 shown Blade sold separately.

86711217

PITTSBURGH APPROXIMATELY **SCISSOR** **SUPER COUPON**

**PNEUMATIC ADJUSTABLE
ROLLER SEAT**

Customer Rating
★★★★★

• 300 lb. capacity

~~\$259~~

**SAVE
69%**

**NOW
\$199**

COMPARE TO
DURALAST **\$64.99**

MODEL: TREG10

ITEM 61160/61896/63456/46319 shown

86721275



SUPER COUPON

20 VOLT LITHIUM CORDLESS
Customer Rating


1/2" COMPACT DRILL/DRIVER KIT

- 450 in. lbs. of torque
- 1.5 amp hour battery
- Weights 3.4 lbs.



SAVE
\$34

NEW

NOW
\$64.99

COMPARE TO PORTER-CABLE
\$99
MODEL: PCC604L1

~~**\$74.99**~~
ITEM 63531


86731438

KRAUSE & BECKER  **SUPER COUPON**

Customer Rating 

**AIRLESS
PAINT SPRAYER KIT**

NOW
\$169⁹⁹

~~\$214⁹⁹~~

SAVE \$129

COMPARE TO \$299

GRACO MODEL: 262300

ITEM 62915/60800 shown





86756578

luminar **OUTDOOR** **SCISSOR** **SUPER COUPON**

NEW 24 FT., 18 BULB, 12 SOCKET
OUTDOOR STRING LIGHTS

Customer Rating
★★★★★

NOW \$199.99

SAVE 50% \$249.99

COMPARE TO **\$399.98** PORTFOLIO

MODEL: SLC12K

ITEM 63483

86757601

HaulMaster  **✂ SUPER COUPON**

4 PIECE, 1" x 15 FT. RATCHETING TIE DOWNS



Customer Rating:  ★★★★★

- 400 lb. working load

COMPARE TO
ATE TOOLS
\$40⁸⁸

SAVE 82% **~~\$12⁹⁹~~**

NOW \$6⁹⁹

ITEM 63057/63056/63094
90984/60405/63150/61524 shown

867-65972

LIMIT 1. Excludes other brands. ©2014

CHICAGO  **ELECTRIC**
POWER TOOLS

Customer Rating
★★★★★

**4" BISCUIT
PLATE JOINER**



**NOW
\$44.99**

~~\$64.99~~

SAVE \$134

COMPARE TO **\$179**
MAKITA

ITEM 69897

86774893

LIMIT 3 coupons per household

YUKON SUPER COUPON

46" MOBILE WORKBENCH WITH SOLID WOOD TOP



Customer Rating **★★★★★**
NOW \$239⁹⁹
~~\$269⁹⁹~~

- 15,704 cu. in. of storage
- 1200 lb. capacity

SAVE \$30

ITEM 64023
64012 shown
86775846
LIMIT 5 - Coupon valid through 7/9/18*

Bauer SUPER COUPON

NEW 15 AMP, 12-1/2" PORTABLE THICKNESS PLANNER



Customer Rating **★★★★★**
NOW \$249⁹⁹
~~\$289⁹⁹~~

COMPARE TO DEWALT **\$399**
MODEL: DW734
SAVE \$149
ITEM 63445
86790626
LIMIT 4 - Coupon valid through 7/9/18*

SCISSOR SUPER COUPON

7 FT. 4" x 9 FT. 6" ALL PURPOSE/WEATHER RESISTANT TARP



Customer Rating **★★★★★**
NOW \$29⁹⁹
~~\$49⁹⁹~~
SAVE 65%

ITEM 69249/69115/69137
69129/69121/877 shown
86703475
COMPARE TO BLUE HAWK **\$858**
MODEL: B38X10-Y
LIMIT 8 - Coupon valid through 7/9/18*

PREDATOR SUPER COUPON

8750 MAX. STARTING/7000 RUNNING WATTS 13 HP (420 CC) GAS GENERATOR



Customer Rating **★★★★★**
NOW \$529⁹⁹
~~\$599⁹⁹~~
SAVE \$2170
COMPARE TO HONDA \$2,700
MODEL: EMU2000C
• GFCI outlets
Wheel kit and battery sold separately.
ITEM 68530/63086/69671/63085 shown
ITEM 68525/63087/63088, CALIFORNIA ONLY
86796082
LIMIT 5 - Coupon valid through 7/9/18*

CHICAGO ELECTRIC POWER TOOLS SUPER COUPON

RECIPROCATING SAW WITH ROTATING HANDLE



Customer Rating **★★★★★**
NOW \$199⁹⁹
~~\$299⁹⁹~~
SAVE 60%
Blade sold separately.
COMPARE TO PORTER-CABLE **\$4998**
MODEL: PC3630
ITEM 61884/65570
62370 shown
86799664
LIMIT 7 - Coupon valid through 7/9/18*

WARRIOR SUPER COUPON

29 PIECE TITANIUM DRILL BIT SET



Customer Rating **★★★★★**
SAVE 83%
COMPARE TO DEWALT \$60
MODEL: DW1369
NOW \$99⁹⁹
~~\$179⁹⁹~~
ITEM 62281/61637 shown
86807958
LIMIT 7 - Coupon valid through 7/9/18*

CHICAGO ELECTRIC POWER TOOLS SUPER COUPON

2.5 HP, 10" INDUSTRIAL TILE/BRICK SAW



Customer Rating **★★★★★**
NOW \$219⁹⁹
~~\$289⁹⁹~~
SAVE \$279
Blade sold separately.
COMPARE TO KOBALT **\$499**
MODEL: KS-116-M
ITEM 62391/69275 shown
86816081
LIMIT 5 - Coupon valid through 7/9/18*

HARDY SUPER COUPON

MECHANIC'S GLOVES



Customer Rating **★★★★★**
NOW \$39⁹⁹
~~\$59⁹⁹~~
SAVE 73%
COMPARE TO MECHANIX \$1499
MODEL: S675800
ITEM 62434, 62426, 62433, 62432, 62429, 62428 shown
86816334
LIMIT 8 - Coupon valid through 7/9/18*

WINDSOR DESIGN SUPER COUPON

60" HARDWOOD WORKBENCH WITH 4 DRAWERS



Customer Rating **★★★★★**
NOW \$129⁹⁹
~~\$159⁹⁹~~
SAVE \$285
Tools sold separately.
COMPARE TO GRIZZLY **\$415**
MODEL: R7725
ITEM 93454/69054
63395/62603 shown
86818706
LIMIT 5 - Coupon valid through 7/9/18*

PORTLAND SUPER COUPON

1750 PSI ELECTRIC PRESSURE WASHER



Customer Rating **★★★★★**
NOW \$79⁹⁹
~~\$99⁹⁹~~
SAVE \$99
1.3 GPM
Adjustable spray nozzle
COMPARE TO BRIGGS & STRATTON **\$17933**
MODEL: 29000
ITEM 63255/63254 shown
86867164
LIMIT 4 - Coupon valid through 7/9/18*

HaulMaster SUPER COUPON

1000 LB. CAPACITY SWING-BACK TRAILER JACK



Customer Rating **★★★★★**
NOW \$179⁹⁹
~~\$259⁹⁹~~
SAVE \$499
Height range: 12-1/2" to 24"
COMPARE TO REESE **\$4499**
MODEL: 74416
ITEM 69780
41005 shown
86871496
LIMIT 5 - Coupon valid through 7/9/18*

Apache Model 1800 SUPER COUPON

ULTRA-LIGHT, CRUSH PROOF WEATHER-RESISTANT LOCKABLE CASE



Customer Rating **★★★★★**
NOW \$99⁹⁹
~~\$149⁹⁹~~
SAVE \$2995
8-3/8" L
5-11/16" W
3-1/4" H
Case contents and locks not included.
ITEM 63518
COMPARE TO PELICAN **\$2995**
MODEL: 1150
86874449
LIMIT 7 - Coupon valid through 7/9/18*

HaulMaster SUPER COUPON

700 LB. CAPACITY BIGFOOT HAND TRUCK



Customer Rating **★★★★★**
NOW \$399⁹⁹
~~\$569⁹⁹~~
SAVE 29%
ITEM 97568/62974/62900 shown
86874705
LIMIT 5 - Coupon valid through 7/9/18*

PITTSBURGH SUPER COUPON

12" RATCHET BAR CLAMP/SPREADER



Customer Rating **★★★★★**
NOW \$29⁹⁹
~~\$39⁹⁹~~
SAVE \$1998
MODEL: S120CH
ITEM 62123/63017/69222 shown
86875776
LIMIT 8 - Coupon valid through 7/9/18*

CENTRAL MACHINERY SUPER COUPON

4" x 36" BELT/6" DISC SANDER



Customer Rating **★★★★★**
NOW \$599⁹⁹
~~\$799⁹⁹~~
SAVE \$39
COMPARE TO GENERAL INTERNATIONAL **\$99**
MODEL: S97004
ITEM 62502/97181 shown
86876267
LIMIT 5 - Coupon valid through 7/9/18*

drill master SUPER COUPON

80 PIECE ROTARY TOOL KIT



Customer Rating **★★★★★**
NOW \$69⁹⁹
~~\$99⁹⁹~~
SAVE \$2481
MODEL: S1832
ITEM 63292/63235/68986/69451/97626 shown
86876474
LIMIT 6 - Coupon valid through 7/9/18*

Lifetime CARBIDE SUPER COUPON

ALUMINUM OXIDE SANDING SPONGES PACK OF 10



Customer Rating **★★★★★**
NOW \$399⁹⁹
~~\$499⁹⁹~~
SAVE 20%
COARSE
ITEM 46751
63918
MEDIUM
ITEM 46752
63915
FINE
ITEM 46753
63912
YOUR CHOICE
ITEM 62163/62349/61467 shown
86877990
LIMIT 5 - Coupon valid through 7/9/18*

VOYAGER SUPER COUPON

12" TOOL BAG



Customer Rating **★★★★★**
NOW \$49⁹⁹
~~\$89⁹⁹~~
SAVE 75%
COMPARE TO AWP **\$1998**
MODEL: SL-2216
ITEM 62163/62349/61467 shown
86889817
LIMIT 5 - Coupon valid through 7/9/18*

CENTRAL PNEUMATIC SUPER COUPON

18 GAUGE, 2-IN-1 NAILER/STAPLER



Customer Rating **★★★★★**
NOW \$159⁹⁹
~~\$229⁹⁹~~
WE CARRY A FULL LINE OF NAILS
COMPARE TO HITACHI **\$5999**
MODEL: NT50AZ
SAVE 73%
ITEM 63156
68019 shown
86895026
LIMIT 7 - Coupon valid through 7/9/18*

CHICAGO ELECTRIC POWER TOOLS SUPER COUPON

VARIABLE SPEED MULTIFUNCTION POWER TOOL



Customer Rating **★★★★★**
NOW \$249⁹⁹
~~\$399⁹⁹~~
SAVE 88%
COMPARE TO DREMEL **\$79**
MODEL: MM25-G2A
ITEM 63113/62867/63111 shown
86895619
LIMIT 5 - Coupon valid through 7/9/18*

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At Harbor Freight Tools, the "Compare to" price means that the specified comparison, which is an item with the same or similar function, was advertised for sale at or above the "Compare to" price by another national retailer in the U.S. within the past 90 days. Prices advertised by others may vary by location. No other meaning of "Compare to" should be implied. For more information, go to HarborFreight.com or see store associate.

Build-a-Box **BIKE RACK**

Get your bike up and out
of the way in an afternoon
By Matt Boley





Finding the space to store your bike can be challenging enough if you have a garage, and if you're an apartment dweller like me, you kinda get tired of tripping over it daily. This simple project gets your bike off the floor and out of your way. It even has an accessory drawer for tools, gloves and other gear. Plus, you can take the rack with you when you move, and it leaves just two tiny holes—no worries about losing your damage deposit! It's a great starter project, so be creative and have fun.



WHAT IT TAKES

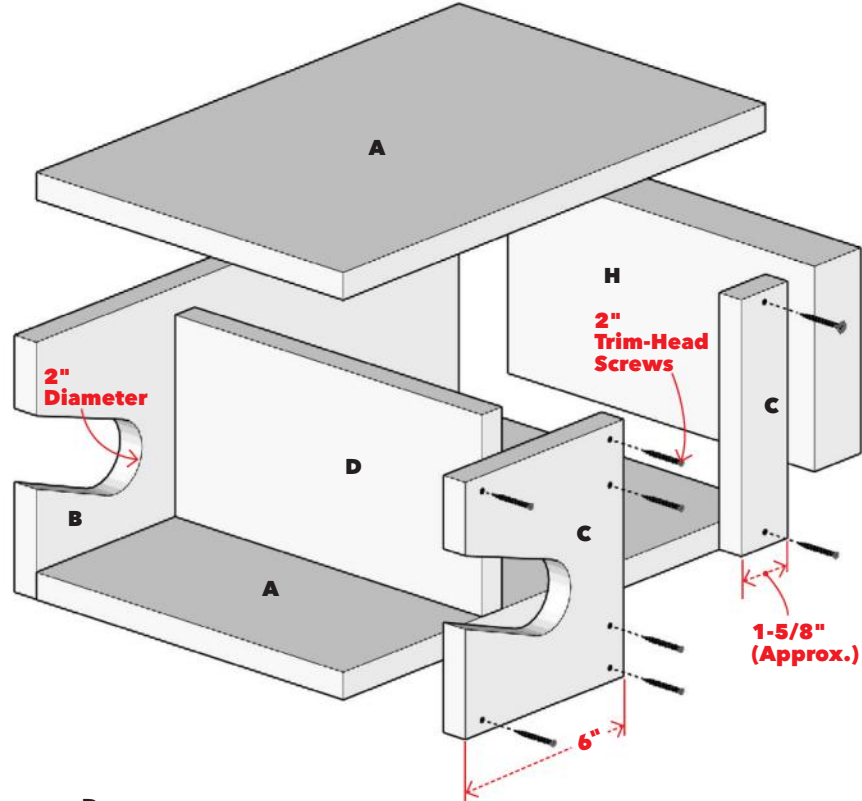
TIME	COST	SKILL LEVEL
2 hours	\$25	Beginner

TOOLS: Circular saw, jigsaw, drill, level and square

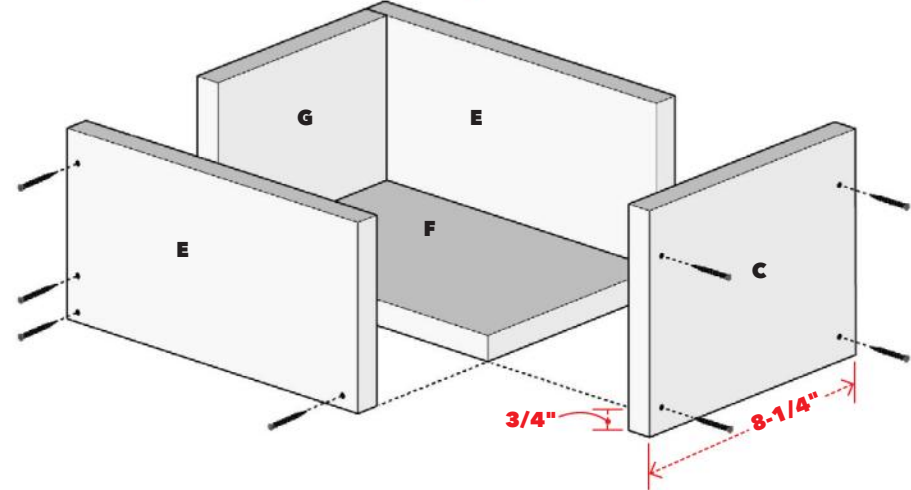
Before you start, set your bike on the floor and test different heights for the optimal setback from windows or doors. If it will be in a traffic area, allow enough room to walk by it. Also measure your bike to be sure the frame will fit the rack's 12-in. width. You may have to modify the rack for some kids' and women's bikes.

Figure A Bike Rack

OVERALL DIMENSIONS:
16" Long x 12" Wide x 7" Tall



Drawer



CUTTING LIST

KEY	QTY.	MATERIAL	DIMENSIONS	PART
A	2	3/4" plywood	3/4" x 10-1/2" x 16"	Top and base
B	1	3/4" plywood	3/4" x 7" x 16"	Side
C	1	3/4" plywood	3/4" x 7" x 16" (cut into 3)	Drawer front and side pieces
D	1	3/4" plywood	3/4" x 5-1/2" x 10-1/2"	Divider
E	2	3/4" plywood	3/4" x 5-1/2" x 10-1/2"	Drawer sides
F	1	3/4" plywood	3/4" x 9-3/4" x 6-3/4"	Drawer bottom
G	1	3/4" plywood	3/4" x 5-1/2" x 6-3/4"	Drawer back
H	1	2x6 board	1-1/2" x 5-1/2" x 10-3/8"	Cleat

Buying materials

Any type of plywood will work for this project, so your choice depends on the look you want. Birch plywood is a good option if you plan to paint the bike rack. Any plywood you buy at a home center will have "voids" in the core that will show up as gaps in the cut edges. But you can easily patch those gaps with wood filler. You'll also need a short scrap of 2x6. Most home centers have a scrap pile where you can get cutoffs super cheap.

Building tips

- A table saw and a miter saw are the best tools for cutting the parts, but a circular saw will also work. To see a guide that will give you perfect cuts with a circular saw, go to familyhandyman.com and search for "saw guide."
- A pair of bar clamps that open to at least 12 in. are helpful for assembly but not essential.
- Most trim-head screws are "self-drilling," but to avoid splitting the plywood, it's best to drill pilot holes.

Figure B Cutting Diagram

DIMENSIONS: 2' x 4'

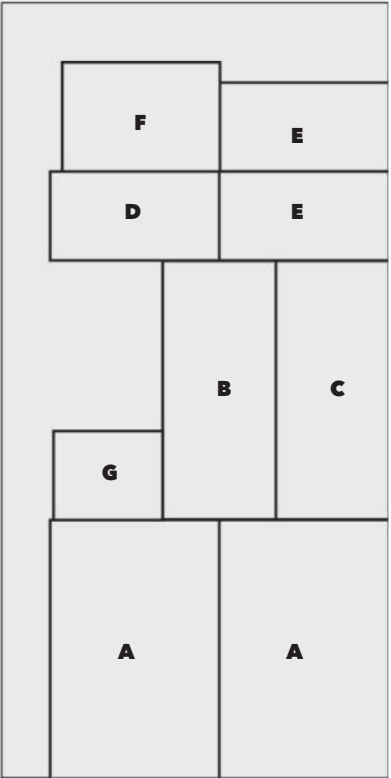


ILLUSTRATION: MATT BOLEY

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Discounts, Call Today Toll-Free

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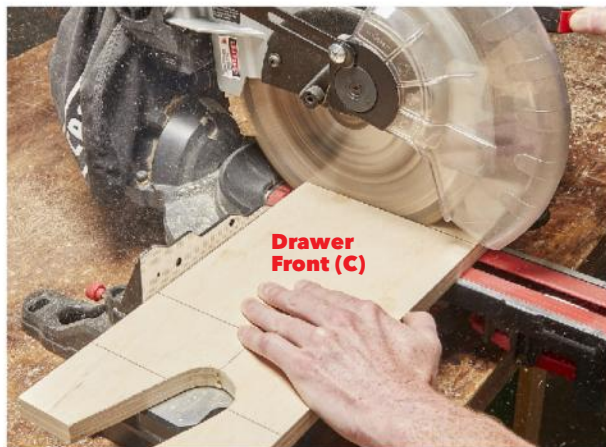
1. MARK THE TUBE SLOTS

With all your parts cut according to the Cutting List, mark the sides (B and C) as shown above. Center a caulk tube on the crosshairs and draw a circle. Draw parallel lines from the top and bottom of the circle.



2. CUT THE SLOTS

To create the tube slots, use a jigsaw to follow the lines you made in the previous step.



3. CUT OUT THE DRAWER FRONT

Cut Side C to form three parts: the drawer front and the two side pieces. Locate the cuts so the drawer front is exactly 8-1/4 in. wide.



4. ATTACH THE SIDES

Glue, clamp and screw Side B to the base. Then glue and screw the two side pieces (from C) to the base.



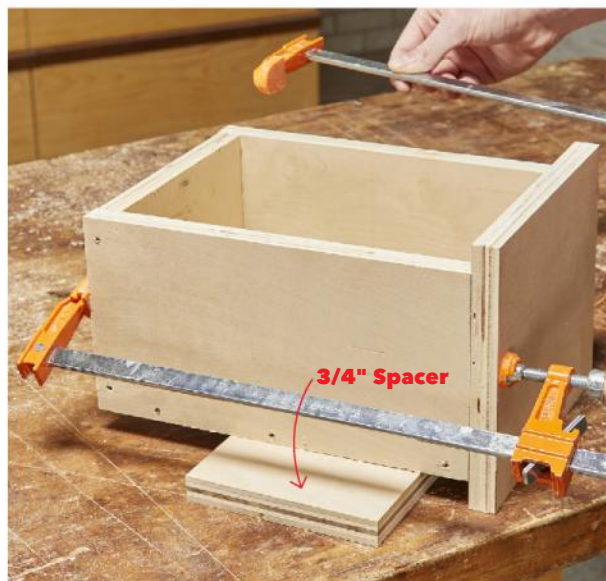
5. INSERT THE DIVIDER

Set the divider (D) flush and square with the side pieces. Clamp the assembly and glue and screw the divider into the box.



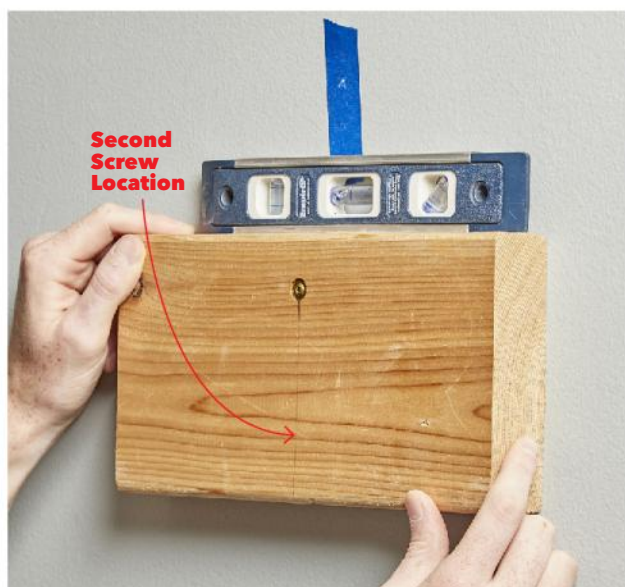
6. ATTACH THE TOP

Glue and screw the top into place. Due to differences in plywood thickness, expect a small gap between the top and the divider (D).



7. ASSEMBLE THE DRAWER

Glue and screw the drawer box together. Then rest the box on a scrap of 3/4-in. plywood spacer and attach the drawer front.



8. SCREW THE CLEAT TO A STUD

Mark the stud with masking tape. Screw the top screw into the cleat (H) with a 3-in. construction screw. Fine-tune the cleat to make sure it's level, then add the second screw.



9. ATTACH THE RACK TO THE CLEAT

Hold the rack tight against the wall and drive four screws (two on the top, two on the bottom) into the 2x6 cleat.

Finishing

You can finish your bike rack any way you wish—paint it to match your walls, customize it like I did or even blow off the finish altogether. I went a little nuts when I finished my rack. I started with a base of white enamel paint and then added pieces of plastic laminate,

which I cut with an X-Acto knife and applied with contact cement.

If you want to paint your rack, I recommend priming first, then using acrylic paints available at any crafts store. Apply water-based polyurethane if you'd like a glossy finish that's smooth to the touch.

MATERIALS LIST

ITEM	QTY.
3/4" x 2' x 4' plywood	1
2x6 board, at least 10-1/2" long	1
2" trim-head screws	23
Wood glue	
Drawer pull/knob	1
3" construction screw	2

ADVANCED HEARING AID TECHNOLOGY

For Less Than \$200

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hearing aid I have used at ANY price!"

— Edward S., Wayne, NJ

How can a hearing aid that costs less than \$200 be every bit as good as one that sells for \$2,250 or more?

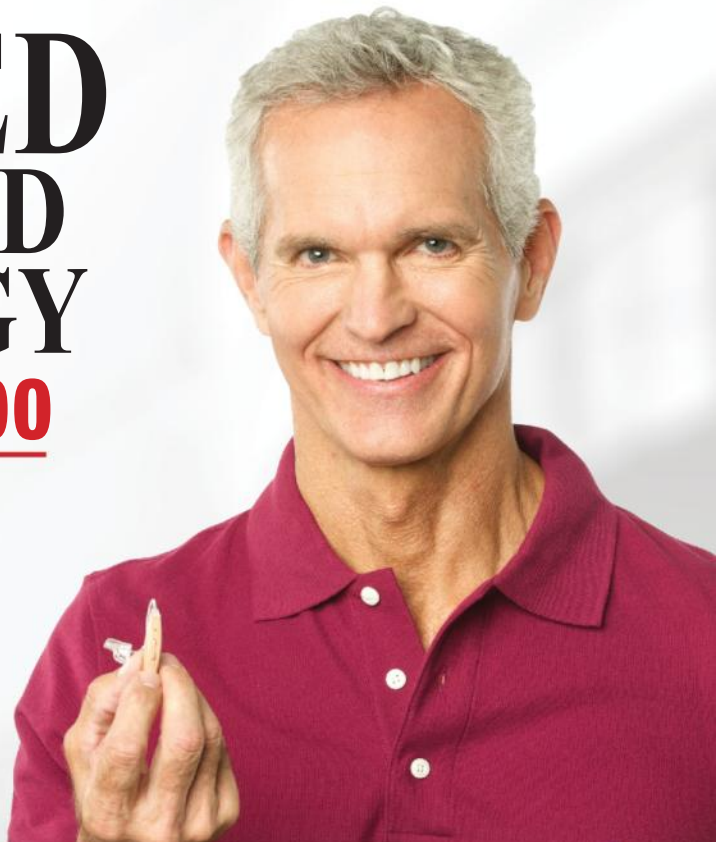
The answer: Although tremendous strides have been made in Advanced Hearing Aid Technology, those cost reductions have not been passed on to you. Until now...

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MDHearingAid® >>>

DOCTOR DESIGNED | AUDIOLOGIST TESTED | FDA REGISTERED



Can a Hearing Aid Delay or Prevent Alzheimer's and Dementia?

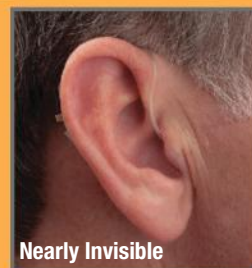
A study by Johns Hopkins and the National Institute on Aging suggests older individuals with hearing loss are significantly more likely to develop Alzheimer's and dementia over time than those who retain their hearing. They suggest that an intervention — such as a hearing aid — could delay or prevent this by improving hearing!

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NO WATER NOW WHAT?

27 tips to prepare for a water outage

By Brad Holden

When disaster strikes and there's no water coming out of the tap, don't get left high and dry. Instead, follow our advice on storing water so you'll always have an immediate reserve. You'll also need to be prepared to purify water that may be unsafe, and to conserve the water you've stored.

Store your water supply in a cool, dark place. Heat and sunlight can degrade water quality.



1. Store water in a food-safe container. Water doesn't have an expiration date, but it can become unsafe to drink if it's not stored properly. For long-term storage of large quantities of water, food-grade plastic is the gold standard. In a last-minute stock-up for short-term storage, the gold standard changes to anything that's clean. In this case, use a method of purification if there's any suspicion that your water may be unsafe to drink.



2. Consider specialized water storage containers, such as the WaterBrick (\$35 each). Made for potable water or food, these food-grade containers have a tight seal and stack like blocks for easy storage.



3. Don't store plastic water containers directly on a concrete floor. The chemicals used in concrete—not to mention oil spills on a garage floor—can leach nasty chemicals into your water supply, giving it a bad taste or making it unsafe to drink. Store your plastic containers on cardboard or on a wooden pallet.

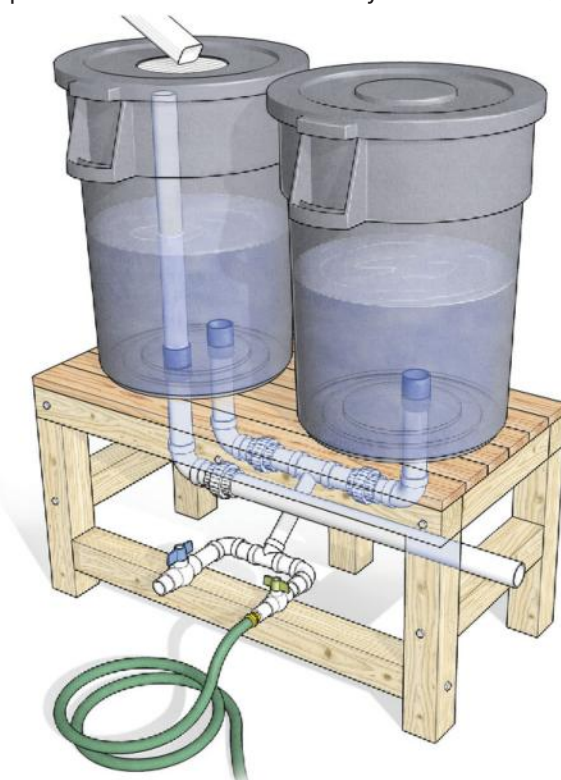


4. Buy a water bladder to put in your tub. The WaterBOB (\$35) holds 100 gallons of water for drinking. Just set it in your tub, wrap the spout around the faucet and fill it up.

5. Store 1 gallon per day per person. The length of time you want to plan for is up to you. The Federal Emergency Management Agency (FEMA) recommends a two-week supply for each person. When you consider all water use—flushing, showers, hand-washing, dishes, laundry, teeth brushing and outdoor watering—that's a LOT less water than we typically use daily. The U.S. Geological Survey estimates that we use an average of 80 to 100 gallons of water per day per person.

6. For serious water storage, consider investing in a cistern. It's very costly, but you'll be able to store anywhere from 200 gallons to thousands of gallons of potable water.

7. Food-grade stainless steel drums are excellent for water storage because they don't let in UV light. On the downside, a 55-gallon stainless steel drum will set you back about \$500.



9. Install a rainwater collection system. You'll still need to purify the water, but it's a good way to take advantage of a natural resource.



10. There are 40 gallons of water or more in your water heater. To extract this water, turn off your water at the house's main shutoff, and turn off the gas/power to your water heater. Open a couple faucets above the water heater, if possible, to break the vacuum effect. Hook up a hose and drain the water from the tank. If there are solids in the water, filter them out before using it.

11. Don't store water in a container that can't be sealed. If a container doesn't have a tight seal, all sorts of contaminants can enter.



8. Stock up on hand sanitizer. By using hand sanitizer instead of soap and water, you can stretch your water supply a little further.

*If you
have a well,
be sure you have
backup power
to operate it.*

12. If stored water tastes flat, oxygenate it by pouring it back and forth between two clean containers.

13. Decrease your activity and keep cool to minimize the amount of water you need to stay hydrated.

14. Fill up your pool. Even a wading pool works. This water will need filtration and purification before you can drink it.



15. Do laundry ahead of time. If you know you'll likely be without water, be sure you have enough clean clothes to get you through.

16. Fill bathtubs and sinks with water. You won't be able to drink this water without purification, but you'll be able to use it as is for washing and flushing the toilet.



17. If you have power, use the water from your dehumidifier. Yes, it's distilled water, but you shouldn't drink it, as it's not purified or filtered. Use this water for washing, toilet flushing or watering plants.



18. Camp showers (\$10 to \$100) are available in a wide variety for those who require a bit more luxury than a sponge bath. This might be a good option if you have a plentiful supply of water.



19. Flush the toilet with a bucket of water, but pour it into the tank instead of the bowl. This method uses less water than pouring it directly into the bowl. Unpurified water, such as water stored in the tub without a container, is perfect for toilet flushing.

20. Dispose of toilet paper in a wastebasket.

Yes, you'll still be flushing your toilet, but there won't be the typical amount of water going through the drain from other sources, so it's more likely that toilet paper could cause a backup.

21. If you're storing plastic bottles of water for an emergency, you should use/rotate your supply once a year or so.

22. Avoid contact with floodwater, which can be extremely toxic. It likely contains all sorts of chemicals as well as raw sewage.



23. Stock up on Clorox wipes and hand wipes. Use these for general cleaning instead of soap and water.



24. Freeze jugs of water. If the power is out, they'll help keep your frozen food safe a bit longer. When the ice melts, you can use it for drinking.



Just because water is clear doesn't mean it's safe. Bacteria, viruses, cysts and potential toxins are not visible to the naked eye.



25. Glass containers are good, if properly sanitized. But they're heavy to transport and they break easily.

26. Filter out solids through a coffee filter before purifying water.



27. Stock up on disposable plates and utensils. Conserve your supply of water by minimizing the number of dishes you have to wash.

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PREVIEW!**

the family
handyman

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WALL SYSTEMS**



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Have a way to purify your water

• **BOILING** kills parasites, bacteria and other pathogens in water. It does not, however, eliminate all forms of chemical pollution. Also, you'll still need to filter out any solids. A camp stove (\$10 to \$150) is a good item to have on hand for boiling because your power might be out as well. Any camp stove will do, but a portable stove that burns wood is nice in case there's a shortage of other fuel to purchase. Don't use camp stoves indoors—they generate carbon monoxide.



• **WATER PURIFICATION DEVICES** (\$15 to \$450) are available at camping supply stores. They come in sizes suitable for one person or large groups. Some of these devices are capable of purification as well as filtration.



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• **WATER PURIFICATION TABLETS** are available at camping supply stores. They fit neatly in an emergency kit, are easy to use and usually have a shelf life of up to five years.



● **BLEACH** is a readily available household item that can be used to purify water. Use only regular, unscented chlorine bleach with either 6 or 8.25 percent sodium hypochlorite as the active ingredient. Using a clean eyedropper and 6 percent hypochlorite bleach, add eight drops per gallon. For 8.25 percent, use six drops per gallon. Stir the water and let it stand for half an hour. If the water doesn't have a slight chlorine odor, repeat the dosage and let it stand for 15 more minutes. In general, you'll need more bleach if the water is cold or murky. Bleach has only a six-month shelf life, so be sure to keep a fresh supply.

*If there's
a flood, don't
assume your well
water is safe.
Test it.*

● **IODINE** is another household chemical that can disinfect water. It is, however, a harsher chemical than bleach. On the upside, you can also use it to treat wounds. Using 10 percent povidone-iodine, add 8 to 16 drops per quart of water, depending on the water's cloudiness.



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HomeCare+Repair

Fix it, maintain it, improve it. By Brad Holden

9 Simple Tips for Faster Wi-Fi

Spinning pinwheels and slow status bars got you down? Keeping current with the latest technology is usually the fix, but if you're the kind of person who'd rather change a set of brake pads than open the settings menu on your computer, take heart. We've put together nine low-tech fixes to help speed up your Wi-Fi, as well as some advanced options for those who enjoy getting software dirt under their fingernails.



1 Move your router
■ **Place your router in a central location.** As you consider a central location, think top to bottom as well as side to side.
■ **Put your router up high in the room.** That way, it's above obstructions.

■ **Keep your router away from other appliances.** For example, an inexpensive, poorly shielded microwave can cause a lot of Wi-Fi interference.
■ **Don't enclose your router.** A Wi-Fi router isn't a thing of beauty, but tucking it in an enclosed space

will degrade the signal and possibly cause it to overheat.

■ **Imagine the physical barriers that can block the signal.** Hidden chimneys, brick walls and utility rooms with lots of metal between you and the router can greatly affect signal strength.

2 Restart your router regularly

Some router firmware is a little buggy, and over time it gets slow. A simple restart often brings it right back up to speed. Unplug your router, wait 30 seconds and then plug it back in.

Some routers can be configured to restart at regular intervals. Look in your owner's manual to see if your router has this feature and how to access it. Alternatively, you can just make a note to restart your router once a week.

3 Get a new router

Check your router's WLAN (Wireless Local Area Network) standard. It will consist of the number 802.11 followed by a letter or letters. You'll find this information in the owner's manual. If you don't have the owner's manual, download it by searching your router's make and model online.

■ **802.11b and 802.11g.** These are the oldest and slowest versions, with a maximum speed of 54 Mbps (megabits per second).

■ **802.11n.** This is a newer version with a maximum speed of 300 Mbps.

■ **802.11ac.** This is the latest version, offering speeds of up to 1 Gbps (gigabits per second).

■ **802.11ac MU-MIMO** (Multi-User Multiple Input Multiple Output) router. MU-MIMO routers send and receive multiple data streams simultaneously to multiple devices without speed drop-off.

If you have an older version, consider an upgrade. If you're renting your router and modem, it makes sense financially to purchase a router. You can get a good one for about \$100. Plus, the firmware on rental units is often inferior.

Wireless Adapter



4 Give your computer a boost

If you upgrade your router but your computer is more than two or three years old, its wireless adapter may not be compatible with your speedy new router.

To reap the benefits of an 802.11ac router on an old computer, look into a USB 802.11ac wireless adapter. Just slip the adapter into a USB port on your computer and enter your router's password when prompted. These adapters are available at big box stores and online for \$20 to \$100.

5 Buy a wireless range extender

Routers broadcast pretty well up to about 150 ft., beyond which the signal gets weak. But this depends on your walls and other obstructions. For a large area, or if you have thick walls, you can buy a wireless range extender to boost your signal. Range extenders pick up the signal from your router and rebroadcast it.

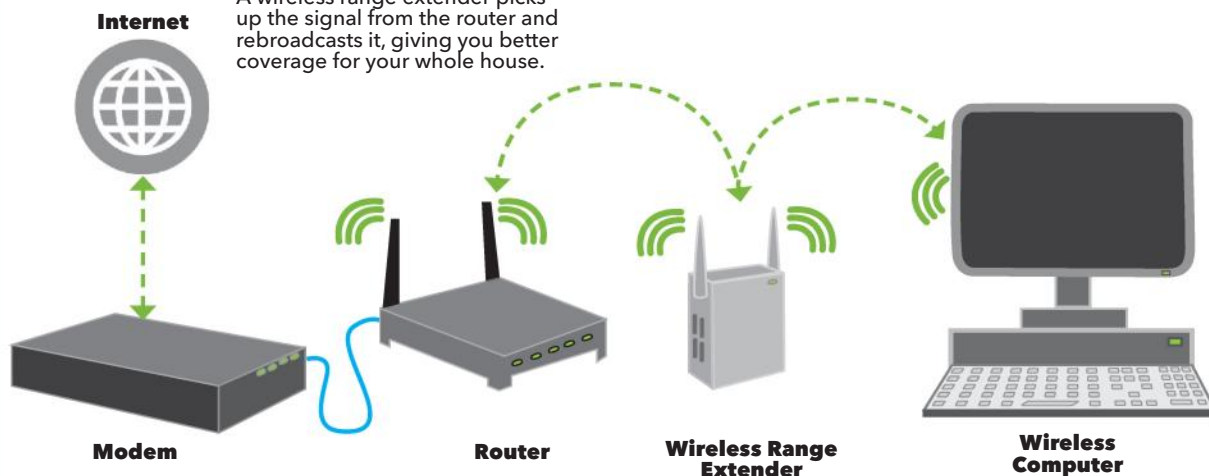
Like your router, a range extender should be

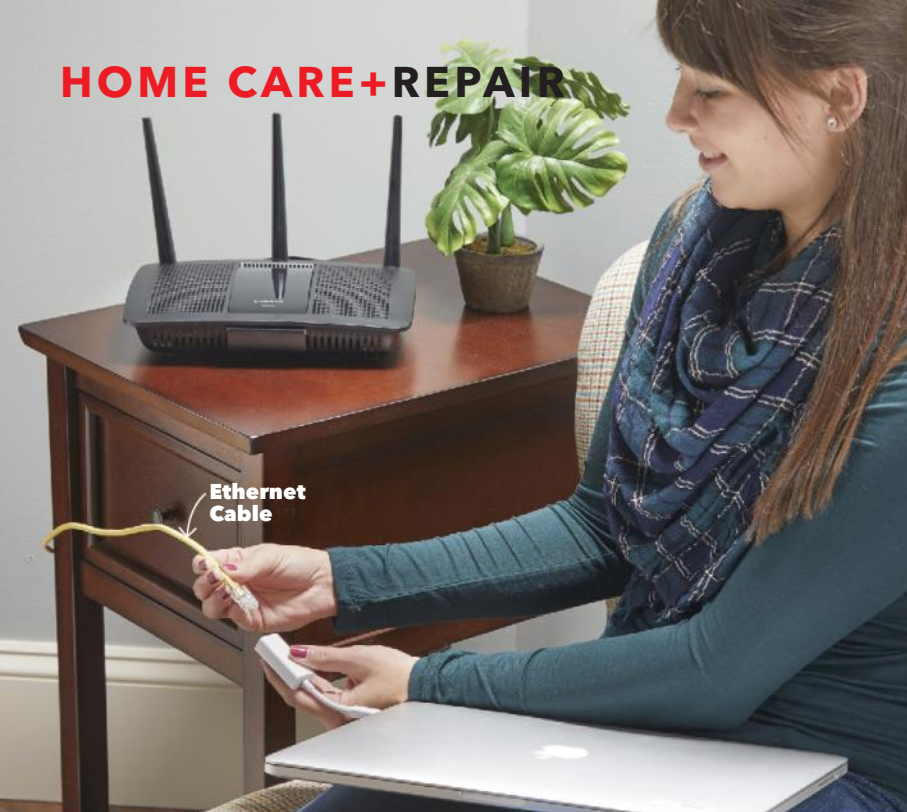
elevated and in the open. Be sure the extender you purchase is compatible with your router's WLAN standard.

A range extender has the advantage of being able to connect to your current system. The downside is that the rebroadcast signal is only about half the bandwidth of your router. Range extenders cost anywhere from \$20 to \$125.

HOW IT WORKS

A wireless range extender picks up the signal from the router and rebroadcasts it, giving you better coverage for your whole house.





Ethernet Cable



8 Switch to 5GHz, maybe

If you have a dual-band router, try switching from the more common 2.4GHz band to the 5GHz band. 5GHz is faster and less congested, but it doesn't have the same range and wall penetration as 2.4GHz.

To make this switch, you'll need to find your router's IP address. It'll be a long number starting with 192, 172 or 10, located either on your router or in your owner's manual. Enter this IP address into your browser's address bar and hit return. That'll take you to your router admin page. Click on the wireless settings tab, and you'll see where to switch from one band to the other.

6 Plug in when you can

A router can only handle so many devices and their competing Wi-Fi signals. If you treat your Wi-Fi as a resource and connect to it sparingly, you'll have plenty of bandwidth available for when you do use it. Whenever you're working near your router, plug into it using an ethernet cable. This frees up more bandwidth for other Wi-Fi devices.

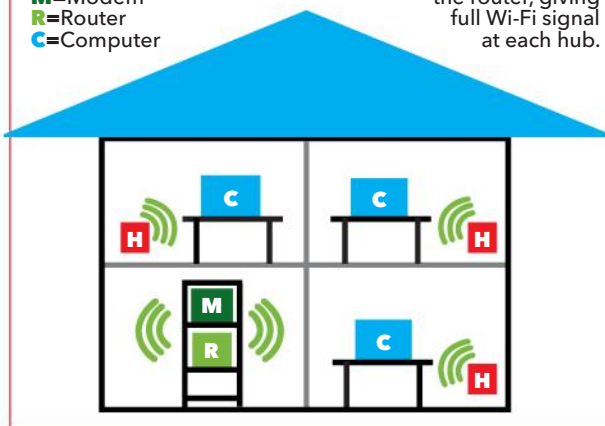
7 Buy a "mesh" Wi-Fi system

A "mesh" or "whole-home" Wi-Fi system is designed to provide coverage to your entire house. These systems come with a main router that connects to your modem, and several hubs that you place throughout your house. A Wi-Fi system is similar to a range extender in giving coverage to hard-to-reach areas. Unlike a range extender, however, a Wi-Fi system gives full Wi-Fi signal at each hub. Also, you can't add the system to your current router. Expect to pay \$130 to \$500 for a system.

HOW IT WORKS

H=Hub
M=Modem
R=Router
C=Computer

The signal is picked up from the router, giving full Wi-Fi signal at each hub.



Old Antennae

9 Add a stronger antenna

The antennae that come with your router might not be strong enough to cover your house, leaving some rooms with a weak signal. Add a "high-gain" external antenna to boost your signal and better cover your whole house. You can purchase one online for less than \$20.

To find out if your house has weak signal areas, turn on your phone's Wi-Fi and walk around the house, watching the Wi-Fi signal. There are also mobile apps, such as Netgear's WiFi Analytics, to help you find where your coverage is weak or strong. HeatMapper and inSSIDer Office are two other tools used to map your signal.

Faster Wi-Fi: Advanced Options

Here are a few tips that'll likely require you to do a bit of research online and in your owner's manual to figure out how to make them work for your setup.

UPDATE ROUTER FIRMWARE

Router manufacturers regularly update their software to improve performance and speed. Update your firmware even if your Wi-Fi speed is fine, as you'll get updated security and features.

UPDATE COMPUTER SOFTWARE

A computer has a Wi-Fi network adapter, which runs on driver software. Be sure your computer is up to date and has all the latest drivers from the manufacturer installed.

DUAL FREQUENCY ROUTERS

Some routers can operate in 2.4GHz and 5GHz at the same time. Some of these routers automatically choose which frequency is best for a given situation. For example, when you're far away from your router, it'll choose 2.4GHz, but when you're closer, it'll opt for the faster 5GHz.

FIND A CLEAR CHANNEL

Most people use their router's default channel, but if nearby wireless networks are on the same channel, you'll get signal congestion. Go into your wireless settings and switch your router to broadcast on a less congested channel. Some routers do this automatically.

SET PRIORITIES

Most modern routers have Quality of Service (QoS) tools to limit the amount of bandwidth that apps use. Enter your router's IP address into your browser address bar to access your wireless settings. You can prioritize which apps and devices get the highest speed.

USE A VPN (VIRTUAL PRIVATE NETWORK)

If some websites are faster than others, try a VPN. VPN is an online service offered by several providers for a small monthly fee, allowing you to create a secure connection to another network over the Internet. With a VPN, all

your traffic is encrypted and appears as if it's originating from another location.

DUAL WAN (WIDE AREA NETWORK)

Many midrange to high-end routers offer a "Dual WAN" option, which allows you to connect multiple ISPs and configure them for use in different scenarios. You can set up your router to operate in one of two modes:

■ **Failover mode.** Your router automatically switches to the second ISP only when the primary connection goes down. It's typically used when the second connection charges for data usage (like cell adapters).

■ **Load Balance mode.** This uses both ISPs at once, sharing the load. Single large-file downloads won't be faster, but overall performance improves when many people are using the internet at once.

CREATE ANOTHER ACCESS POINT

Run an ethernet wire to a different location in your house and set up another router with the same SSID and password. Devices will automatically connect to the stronger signal.

INSTALL DD-WRT

DD-WRT is an open-source custom wireless firmware, created and maintained by people other than the router manufacturer. Many manufacturers now offer routers with DD-WRT already installed, but you can download it and install it yourself on a wide variety of routers. DD-WRT can improve performance and provide access to more advanced networking features.



MEET THE EXPERT:
Andy LeTourneau is a senior software engineer at Clockwork Active Media Systems in Minneapolis.



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Home Smarts

The knowledge you need to be a better homeowner. By Gary Wentz



ASHLAR BLOCKS: Ashlar walls contain blocks of different sizes, shapes and sometimes, colors. These blocks were tumbled, which breaks off the sharp edges.



STANDARD BLOCKS: Blocks of a single size and shape are easier to work with than ashlar blocks. This is “straight face” block, but tumbled is available too.



THREE-WAY SPLIT BLOCKS: Because the corners are split off, these blocks are best for tight curves. They’re easy to stack and usually less expensive.

Planning a retaining wall

When you’re choosing concrete block for a retaining wall, keep in mind that some types of block allow more design options than others. There are two key differences:

- Some block systems allow graceful curves, even tight curves. Others allow only large-radius curves—or no curves at all.
- Some systems include a variety of options such as capstones to top off the walls, blocks intended for above-ground “seating” walls, matching stair blocks or patio pavers. Others primarily offer plain blocks.

Designing a wall and selecting block can get complicated. To start, snap a few photos of the wall site and sketch a rough plan. Then visit a garden center that specializes in hardscaping. That’s where you’ll get the best advice and widest selection. Most stores have several types of block on display. Be prepared for huge cost differences. Some block systems cost as little as \$4 per sq. ft. of wall surface. Others, depending on the features you choose, can cost \$20 or more.

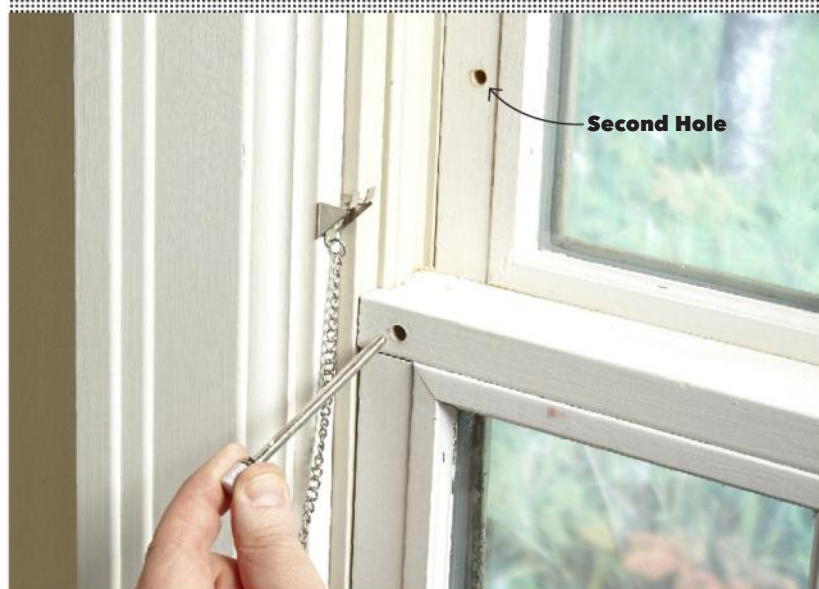


DON'T PUT OFF PRUNING

With every year of delay, trees and shrubs become harder to prune. As branches get bigger, so does the task of trimming them. A job that would take 20 minutes now might consume an hour next year. You may also need bigger tools. Worse, neglected trees or bushes can become so hopeless that you'll have to cut them down and start over.

Pocket storage

Hang-up shoe organizers let you add easy-access storage just about anywhere—fast! Find them for about \$15 at discount stores.



SIMPLE WINDOW LOCKS

The latches on most double-hung windows are no match for a burglar with a pry bar. Pin locks are an easy solution. To install one, all you have to do is drill a hole. If you want to lock the window in a partially opened position, drill a second hole. Pin locks cost about \$5 at home centers and online. They work well on sliding patio doors too.

Car+Garage

Expert advice on repair, maintenance and gear. By Rick Muscoplat

FREE UP STUCK BOLTS

It seems like every repair job involves at least one stuck bolt. And over the years I've learned that brute force isn't the best bolt removal technique. Here's my proven approach for removing the most stubborn fasteners without even breaking a sweat.

MEET THE EXPERT



Rick Muscoplat has decades of automotive repair experience and a great website: ricksfreeautorepairadvice.com.

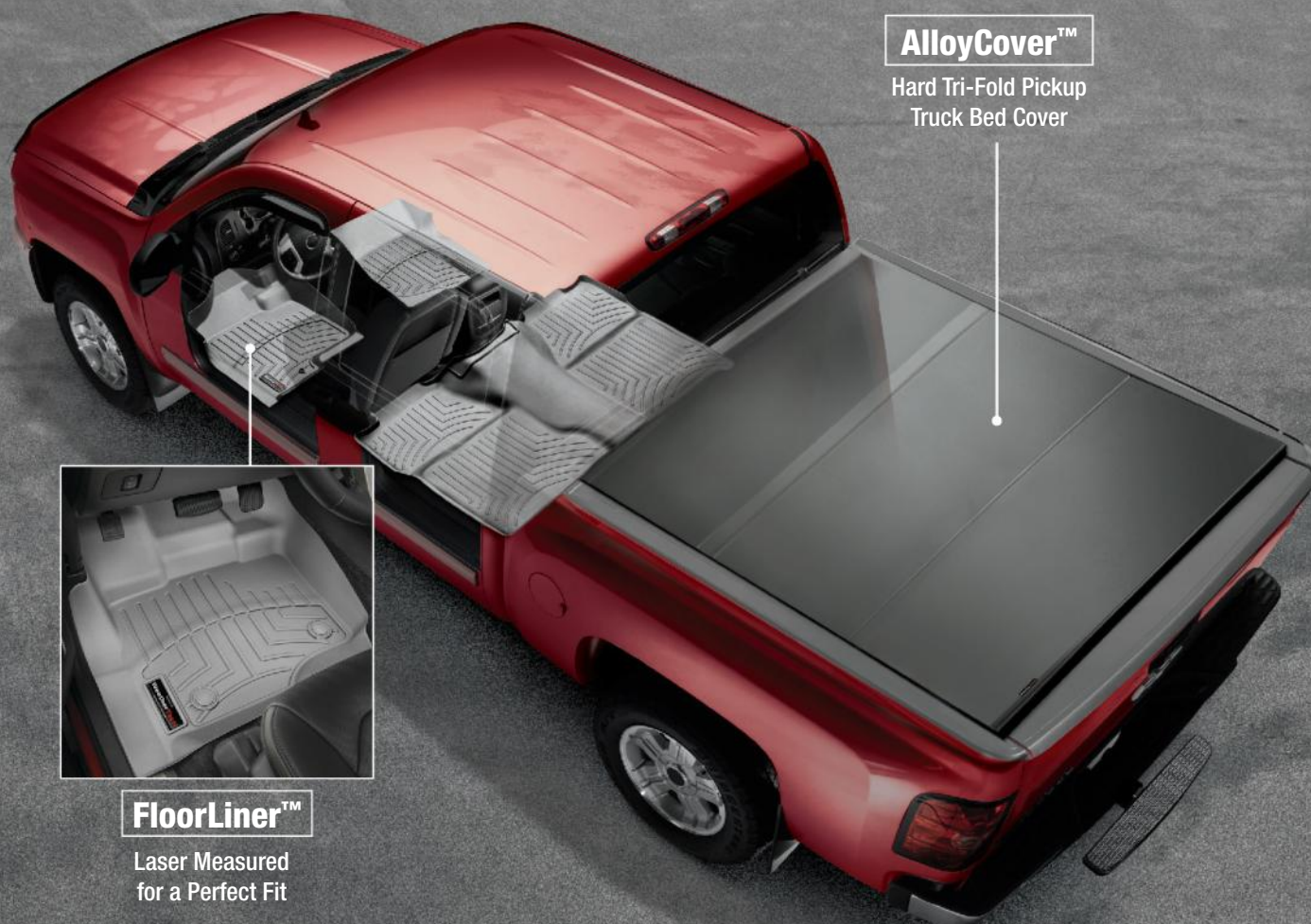
Start with a rust penetrant

Rust penetrants contain a solvent to dissolve rust, a lubricant to lower friction, and a surface tension reducer to get deep penetration. Home brews like Coca-Cola, kerosene and mineral spirits don't have all those ingredients. Neither do general-purpose lubricants. Those products simply don't work as well or as fast as actual rust penetrants. You can

1. Give them a shot of rust penetrant. Soak the bolts for at least 15 minutes before attempting to loosen.

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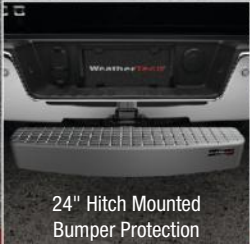


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find penetrants like Liquid Wrench Penetrating Oil, WD-40 Specialist Rust Release and PB B'laster at home centers and auto parts stores.

Start by soaking the bolts for at least 15 minutes before you attempt removal (**Photo 1**). If they still won't budge, move on to the "shocking" phase (**Photo 2**). You can smack the bolt heads with a hammer. But I get the best results with an air hammer and a hammer bit (GRY No. CH117 hammer bit; about \$12 online).



I've also had good luck with an air hammer socket adapter (No. PH1050; \$53 at snaupon.com). Slip an impact socket onto the adapter and try to loosen the fastener while pulling the trigger (**Photo 3**).

If neither trick works, heat and cool the bolt. The expansion and contraction will open cracks in the rust and allow the penetrant to work. But before you heat it, wash off the rust penetrant (most penetrants are flammable). Next, remove any rubber or plastic parts that may be damaged by heat. Then heat the bolt head with a propane torch (**Photo 4**). Immediately shock the bolt with water spray (**Photo 5**). Once the bolt cools, reapply rust penetrant and try removing it.



2. If that fails, hit it with a hammer

Create micro cracks in the rust with blows from a ball peen hammer, or even better, an air hammer and a hammer bit. Then apply more rust penetrant and "reshock" the bolt head. Repeat until you can turn the bolt.



3. Try a socket on your air hammer

Apply torque to the adapter with a wrench while you apply air hammer blows. The dual force breaks the bolt loose.



4. If all else fails, heat it up
Aim the flame at the bolt head, not the surrounding metal. Heat for about 15 seconds, but do NOT get it cherry red (overheating damages the bolt's temper, and you'd have to replace the bolt).



5. Then cool it down quickly
Spray the hot bolt with water and continue spraying until it no longer steams.



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WHAT'S **WRONG** WITH THIS PICTURE?

We'll show you the problem—and the fix. By Jeff Gorton

A SLICE IS NICE

All torn up

Tearing off trim can often take the paint and even the drywall paper along with it, making lots of extra work. All the wall patching needed to fix this mess could easily have been avoided with just a little more work up front.



THE RIGHT WAY

When you're removing trim, take a minute to slice through the caulk or paint between the moldings and the wall or ceiling. Run a sharp utility knife along the intersection between the wall and the trim to separate them. Then you can remove the trim without wrecking the wall.



Thanks to our friends at the American Society of Home Inspectors for sharing photos submitted by their members. For more, visit ashireporter.org.



CREATIVE PLUMBING

APPLE FLAPPER

Given how finicky toilet flappers can be, it would be awesome if an apple would do the job. As for the sock, we suspect it's a substitute for a missing fill valve cap (see below). Or maybe it's just decorative.



THE RIGHT WAY

Take your leaky old toilet flapper to the hardware store and match it up with a new one.



LEAK MAGNET

OVER-THE-TOP FLASHING

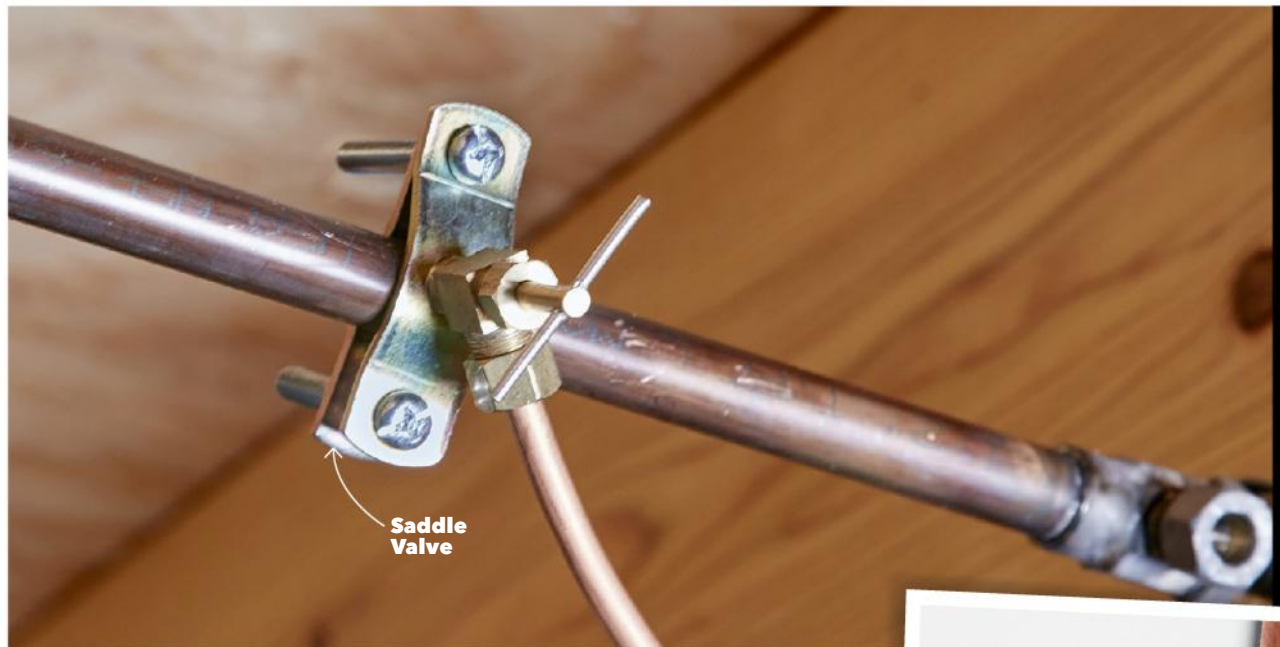
This is definitely the easiest way to add flashing to a plumbing vent. But no matter how much roof cement you smear on, it won't keep water out.



THE RIGHT WAY

As an extra precaution, it's good practice to seal underneath vent cap flashing when you install it. But properly installed shingles are what will keep the water out. The lower portion of the flashing should overlap the shingles. And on the upper part, the shingles should go on top of the flashing. This method sheds water without the use of sealants.

WHAT'S WRONG



TEE IS A BETTER CHOICE

SADDLE UP FOR A HEADACHE!

Saddle valves are frequently used to route water to appliances like ice makers and furnace humidifiers. They work by piercing the copper line with a hollow needle. A rubber gasket seals between the clamps and the copper line. But saddle valves are notoriously unreliable and eventually clog or leak. And they're virtually impossible to shut off after a few years.



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Dr. Gundry has unveiled a simple — yet highly effective — solution to issues that plague millions of Americans over 40: low energy, low metabolism and fatigue.

“When you’re feeling low energy, that’s your body screaming **HELP!**” Dr. Gundry’s radical solution was inspired by a breakthrough with a “hopeless” patient who had been massively overweight, chronically fatigued and suffering from severely clogged arteries.

The secret to his breakthrough? **“There are key ‘micronutrients’ missing from your diet,”** Dr. Gundry said, “If you can replenish them in very high dosages, the results can be astonishing.”

Users of this new method is what led Dr. Gundry to create an at-home method for fatigue.

“They’re reporting natural, long-lasting energy without a ‘crash’ and they’re feeling slim, fit and active,” he



revealed yesterday.

Dr. Gundry’s team released a **comprehensive video presentation**, so that the public can be educated as to exactly how it works.

Watch the presentation here at **www.GetEnergy28.com**

Within just a few hours, this video had gotten thousands of hits, and is now considered to have gone viral. One viewer commented: “If this works, it’s exactly what I’ve been praying for my whole life. I’ve never seen anything like it before...the truth about my diet was shocking and eye-opening.”

It makes a lot of sense, and it sounds great in theory, but we’ll have to wait and see what the results are. Knowing Dr. Gundry, however, there is a great deal of potential.

See his presentation here at **www.GetEnergy28.com**

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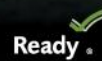
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How To: Repair Your Body



One of 2018's more interesting innovations came when Dr. Rand McClain, the Los Angeles based "Doctor to the Stars," released his new technique for what some are calling the **Body Restore formula**.

And the reason everyone's talking about it is because his method is based on technology that was actually partially banned by a U.S. Establishment in 2001. However, Dr. McClain and his partners have found a way that allows them to go and take this discovery straight to the American people.

Dr. McClain revealed he's already offering this to his celebrity and pro-athlete clients with incredible results.

In the video presentation – he details how some very big name athletes are achieving **increased strength, healthier bodies, and even more energy**.

But what's really turning heads is that the method involves one simple thing: A drink.

McClain believes the technique works best for people over 40, particularly those who may be experiencing fatigue, weaker bodies, and even "foggy" thinking.

And when Dr. McClain dropped the final bombshell — video footage of the results he experienced after using the method on himself — it became clear that the discovery is nothing short of incredible, of course your individual results will vary.

But the latest development in this story came when the video version of the presentation was made available to the public online.

As of this writing, the video has over 3 Million views and is quickly becoming "viral".

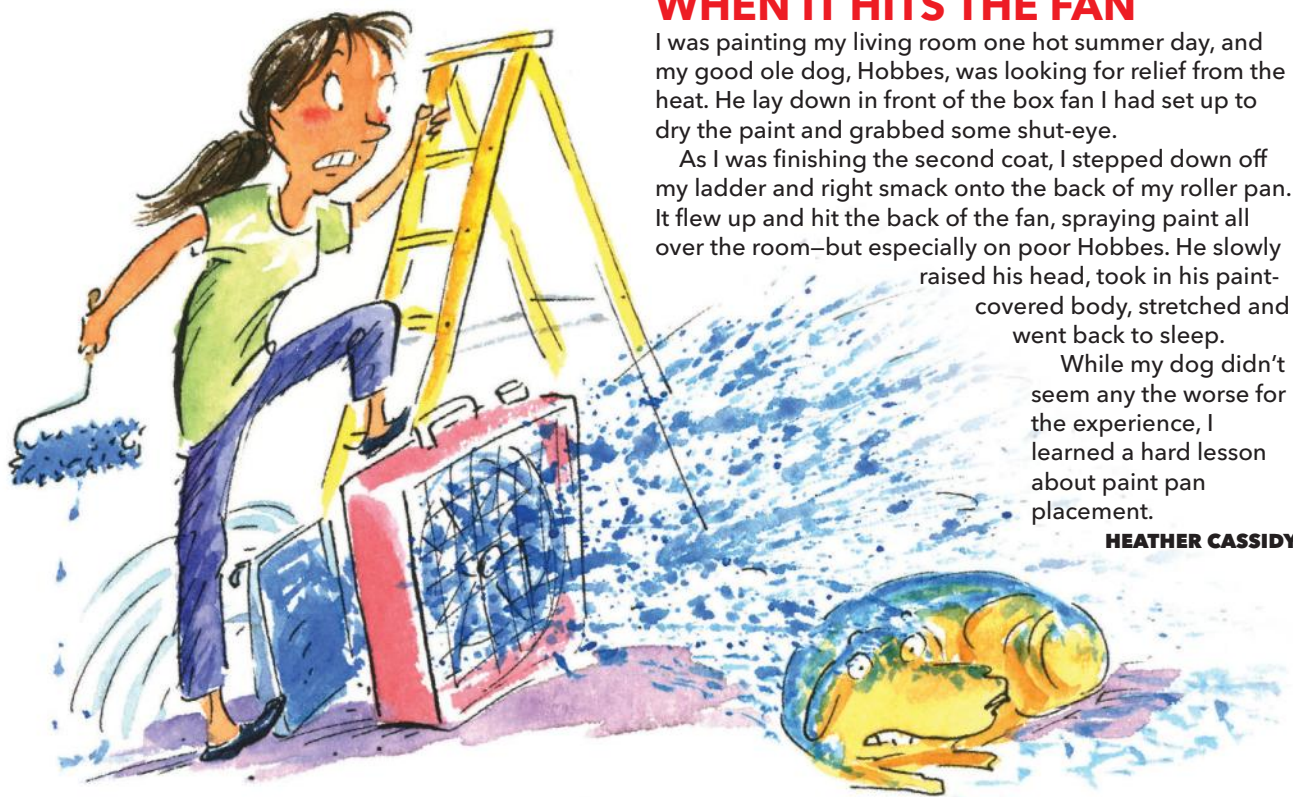
This is the video that many might not want people to see, but if you want to learn more watch the shocking presentation at **www.LCR25.com**

Dr. McClain calls out both the medical industry and certain agencies. One viewer commented: "Why did I not know this before? Rand is telling it like it is...we need more doctors like this!"

You can watch his presentation at **www.LCR25.com**

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Laughs and lessons from our readers



WHEN IT HITS THE FAN

I was painting my living room one hot summer day, and my good ole dog, Hobbles, was looking for relief from the heat. He lay down in front of the box fan I had set up to dry the paint and grabbed some shut-eye.

As I was finishing the second coat, I stepped down off my ladder and right smack onto the back of my roller pan. It flew up and hit the back of the fan, spraying paint all over the room—but especially on poor Hobbles. He slowly raised his head, took in his paint-covered body, stretched and went back to sleep.

While my dog didn't seem any the worse for the experience, I learned a hard lesson about paint pan placement.

HEATHER CASSIDY

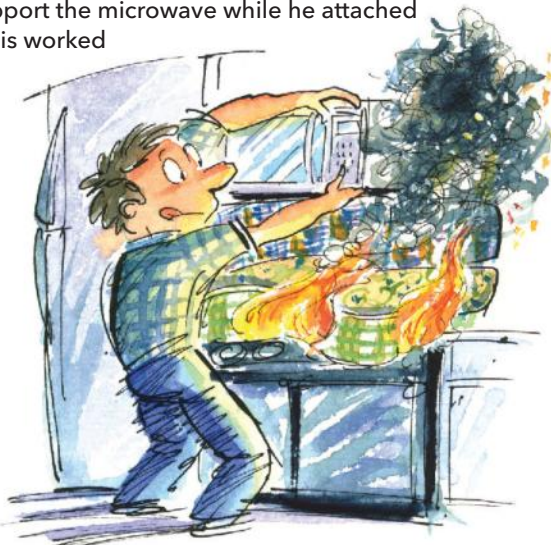
NOT SO HANDY MAN

When my husband was just starting out in the handyman business, he took a job installing an over-the-range microwave. Holding up the unit while securing it to the cabinet was next to impossible. So being a resourceful guy, he grabbed the cushions from the couch and stacked them on the stove to support the microwave while he attached the unit to its bracket. This worked

great—until he inadvertently twisted one of the stove burner knobs with his belt buckle. Of course, the cushions caught on fire. He was able to hustle the flaming cushions outside before they burned down the whole house.

He quickly learned that there isn't much money to be made in small jobs when you have to buy your customer a new couch.

DEANNA WALLACE



JUST A TRICKLE

I was helping remodel a kitchen, and when we installed the sink cabinet, I saw that a water supply valve was dripping. I plugged it with a cloth to keep the bottom of the cabinet dry. A few weeks later, we installed the sink and hooked up the faucet but got only a trickle of water. We called the faucet company and tried several fixes but nothing worked. Finally, I removed the shut-off valve and found the cloth still doing its job of blocking the flow!

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