

# family handyman

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## GARDEN ARBOR

*build it in one afternoon!*

**TOILET TROUBLE?**

*What you need to know*

**REFRESH YOUR DECK**  
**THE RIGHT WAY**

**PRO TIPS FOR NEATER PAINTING**

**SPACE-SAVING KNIFE RACK**

APRIL 2019





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\*Excludes other GM vehicles.





CHEVROLET





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family  
handyman

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DIY ADVICE  
SINCE 1951

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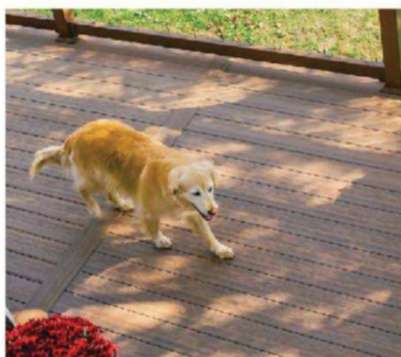
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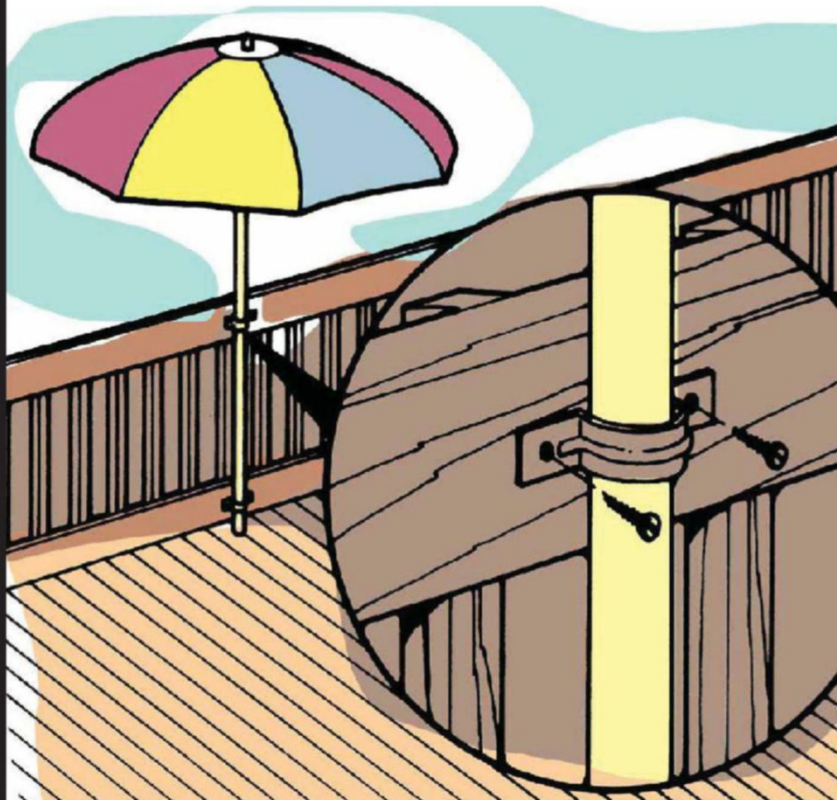
The new toilet seat was a smash! Plus, two more tales of how to get a job done wrong.





# MORE **family handyman**

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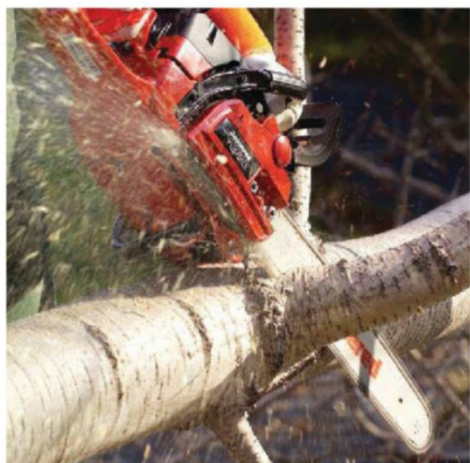
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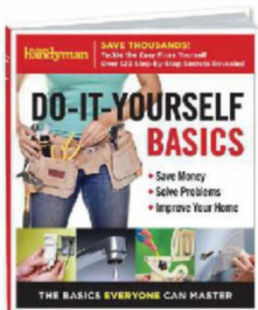
## VINTAGE HANDY HINTS®

We've cracked open the *Family Handyman* vault to show off our favorite reader-submitted Handy Hints from decades past. Turns out they're still pretty brilliant today. To see all 100 of these gems, go to **familyhandyman.com** and search for "vintage handy hints."



## See More "Stuff We Love"

Have you signed up for the new Stuff We Love newsletter yet? Check out more of our favorite tools and gear every week! Go to **tfhmag.com/signup**.



## Don't pay a professional tons of money! Tackle home tasks yourself

In our *Do-It-Yourself Basics* book, you'll find step-by-step instructions on how to improve your home using common tools and easy-to-buy materials. Search for "do-it-yourself basics" at **rdstore.com**.

## Saturday Morning Workshop

Find many simple woodworking projects exclusively on our website. Get step-by-step plans, technical art and a video tutorial for each done-in-a-day project. Visit **familyhandyman.com** and search for "saturday morning workshop."





# Stuff We Love

Our favorite DIY tools, materials + gear. By Mike Berner



## A LONGER-PIN PINNER

**D**eWalt has introduced a micro pinner that can fire 2-in. pins recessed into oak. It's affordable, too. Many other name-brand versions that can

do this cost at least twice as much.

This 23-gauge pin nailer excels at pinning together delicate material, leaving barely visible nail holes, and holding edge banding

while the glue sets. It features a simple jam release latch to make removing jammed pins a cinch. And because it stops firing when you run out of nails, you don't have to worry that you've been shooting blanks. You can get this pin nailer for about \$150 at home centers.





## SMART PLUGS TO EASE YOUR MIND

How often have you been at work worrying whether you left the iron or space heater on at home? Well, if it's plugged into a Wemo Smart Plug, worry no more—you can turn the power off when you're away. Controlled by an app on your phone and connected to your home Wi-Fi, these units offer some great features:

- You can schedule anything that's plugged into it.
- You can use Voice Control with Google Assistant or Amazon Alexa.
- The "Away Mode" will randomly turn a lamp on and off while you're on vacation.
- One model, the Insight shown above, enables you to monitor your energy use.
- Wemo Mini Smart Plugs are stackable and don't block the outlet when they're plugged in.

**Note:** These plugs control the power to the device that's plugged in but not the device itself. For example, a lamp or humidifier will turn on when supplied with power, but a coffee maker will still need to have a button pressed. Single units are \$35 to \$45, and multipacks are \$60 to \$100 at [belkin.com](http://belkin.com).



## Light and comfy work boots

**W**ork boots are rarely perfect. Some are super tough and offer solid support but are really heavy. Others are comfortable to walk in but not durable long-term. These San Jose 6-in. boots by Keen have an unlined leather upper that is comfortable right out of the box. The footbed provides support for a full day's work, and the wedge sole makes you feel like you're gliding over the ground. It comes in three attractive colors with an aluminum safety toe. A great boot for \$155.



## RECHARGEABLE WORK LIGHT

This ROVER Pivoting Flood Light by Milwaukee fits in the smallest of spaces and has three light output modes, allowing you to choose maximum brightness or maximum run-time. The light head pivots 210 degrees for the best task lighting, making it great for working in tight mechanical rooms, crawl spaces and under the hood.

The REDLithium battery included is rechargeable via the USB cable. You can use the light's magnetic base to mount it to metal, or the carabiner to clip it to overhead pipes or cables. The ROVER Pivoting Flood Light costs about \$70 at home centers and online.





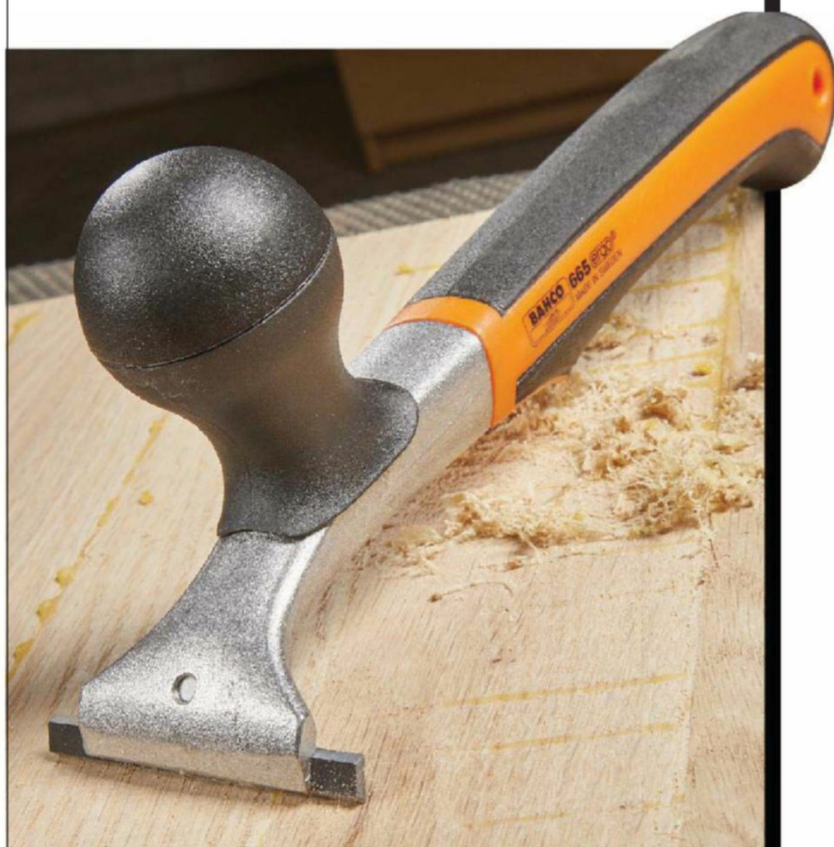
## Deep-reach marker

**F**astCap's Long Nosed Pattern Marker does a few things that a standard marker can't, like mark through narrow holes with the needlelike tip, which is 1-1/8 in. long. The long, thin nose is great for tracing intricate patterns where a standard marker or pencil can't get close enough to be accurate. The other end has a chisel tip for writing and general marking. The marker is available in black, silver and gold for about \$6 online.

## MY GO-TO LEAF BLOWER

I have a powerful backpack blower that moves mountains of leaves in spring and fall. But the rest of the time, I rely on my Worx 56-volt battery-powered blower (about \$180). I use it to blow out my car, the shop and garage (no gas fumes!) and to clean vacuum filters. I even climb up on the roof and blast debris off the shingles. I've used lots of handheld battery-powered blowers, but none with the balance and power of this one. The battery lasts about 15 minutes, generally long enough for most tasks.

**TRAVIS LARSON,**  
SENIOR EDITOR



## HEAVY-DUTY SCRAPER

Bahco's 2-1/2-in. ERGO Paint Scraper is in a class by itself. The cemented carbide blades last much longer than conventional steel. The textured rubber handle provides a comfortable grip, and along with the knob, lets you use both hands so you can scrape with less effort. And the reversible blade is easy to flip when one side gets dull. This ERGO scraper is available online for about \$30.

**TAMAR HANNAH** transforms rough lumber into unique conversation pieces. She creates project plans and shares them on her site, [3x3custom.com](http://3x3custom.com).





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## STUFF WE LOVE

### CHANGE YOUR BIT WITH ONE QUICK FLIP

The Montana Modular Drill and Drive set makes drilling pilot holes and driving screws a snap. Everything you need is in one multipurpose unit. Drill the pilot hole, pull on the quick release, flip it over and drive the screw—perfect! The kit comes with all the sizes of countersink bits you'll need, along with Nos. 1, 2 and 3 Phillips-head driving tips. For about \$20, you can really speed up your work! Find them at [montanabrandtools.com](http://montanabrandtools.com).



### THE ULTIMATE HANG-STUFF-ON-THE-WALL TOOL

This Kapro 313 Measure Mate 24-in. layout and marking tool wears a lot of hats: It's a horizontal and vertical level, a measuring stick, a straight-edge for cutting picture mats and a centering tool. It even has a pull-out clip on the end to help hold screws and tiny nails while you install them.

To hang a shelf or rack with hidden keyhole mounts (which must be spaced the exact distance apart), align the two sliding markers with the keyhole slots, then position the level at the appropriate height and transfer those measurements to the wall. Your mounting screws will be dead level and correctly spaced. It's great for cutting cardboard; the triangular shape keeps your fingers up and out of the way of your blade.

The Measure Mate costs about \$14 online.





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# Handy Hints®

Clever solutions from our readers

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HANDY HINT  
WITH US!

submissions@  
familyhandyman.com

## Seed Starter Tubes

Empty tubes of toilet paper and paper towels make perfect seed starters. Set the tubes in a tray, fill them with potting soil and plant your seeds. The tubes decompose when you plant the seedlings in the garden. Keep the tubes below the soil surface so they don't wick moisture away from the roots.

**BONNIE FALK**







## KITCHEN TRAY IN THE BATHROOM

A silverware drawer insert works just as well in the bathroom as it does in the kitchen. The various compartments are perfect for organizing toothbrushes, toothpaste, razors, clippers, lip balm and more.

**CARRIE BREINIK**



## GREAT GROUT HAZE CLEANER

When I tile a backsplash or floor, I like to use a scrap of carpet to clean off the grout haze and buff the tiles to a shine in one easy step. The carpet fibers are slightly more abrasive than a sponge or cotton rag but not abrasive enough to scratch the tiles. They just remove the grout haze quickly with minimal elbow grease. If you don't have a clean carpet scrap handy, check at a home center—most have small samples available for free.

**MATTHEW FARMER**



## FLOWER-POT FILLER

Water settling at the bottom of pots can lead to root rot from poor aeration. To combat this, toss a few old sponges in the bottom of the pot. The sponges retain moisture and create necessary air space. They also help prevent water from running out the bottom.

**ANGIE WHITE**





## SAFE BLADE DISPOSAL

While removing a bunch of old caulking on my boat, I burned through a lot of utility knife blades. To safely dispose of the used blades, I put them in a soda can and pushed the pop top back over the opening to contain them.

**JUSTIN ZACK**

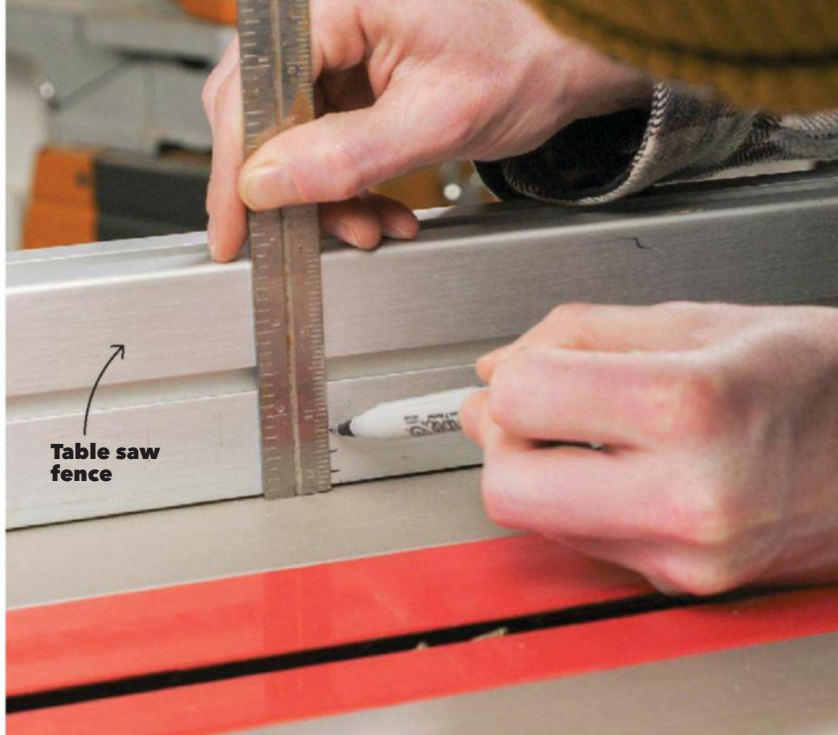


Table saw fence

## Built-in Blade Height Gauge

Here's a quick way to set your blade or dado height for non-through cuts on the table saw. Make a scale directly on your table saw's fence using a fine-point permanent marker. You'll have to refresh the marks once in a while; they'll get rubbed off by stock sliding against the fence.

**NORM MATUSKA**



Adhesive-backed veneer

## No-Fuss Veneer Trimming

You don't need a special veneer trimmer or even a router to trim wood veneer. But don't try to trim the veneer from the finished side. Flip the workpiece over on a flat work surface instead. Then slice the veneer with a sharp utility knife from the back side. If the project is too big to set on a workbench, hold a backer block against the veneer face as a cutting surface.

**MATT BOLEY**



# SAVE When You Grow A Zoysia Lawn From Living Plugs!

From Plugs...

...To A Fabulous Lawn



Zoysia Lawns are thick, dense and lush!

## THE ONE TIME, LIFETIME LAWN SOLUTION!

**Save Water! Save Time! Save Work! Save Money!**

### Zoysia Grows Where Other Grass Doesn't!

Plant a genuine Amazoy™ Zoysia lawn from living plugs once and never plant a new lawn again. Zoysia is the perfect choice for hard-to-cover spots, areas that are play-worn or have partial shade, and for stopping erosion on slopes. North, South, East, West – Zoysia grows in **any** soil, no ifs, ands or buts!



Zoysia thrives in partial shade to full sun!

### Cuts Watering & Mowing By As Much As 2/3!

Many established Zoysia lawns only need to be mowed once or twice a season. Watering is rarely, if ever, needed – even in summer!

#### Your Assurance of Lawn SUCCESS Each Order for Amazoy Zoysia Plugs is GUARANTEED

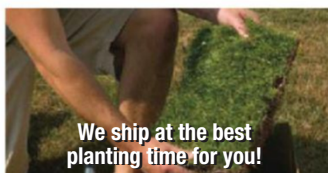
Guaranteed to grow new green shoots within 45-60 days or we'll replace it FREE – for up to 1 year – just call us. We ONLY ship you living genuine Amazoy Zoysia grass harvested direct from our farms. Easy planting and watering instructions are included with each order. Every Reorder assumes success of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

### Eliminates Endless Weeds And Weeding!

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 crab-grass and most summer weeds from germinating.

### Environmentally Friendly, No Chemicals Needed!

No weeding means no chemicals. You'll never have to spray poisonous pesticides and weed killers again! Zoysia lawns are safer for the environment, as well as for family and pets!



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Meyer Zoysia Grass was perfected by the U.S. Gov't, released in cooperation with the U.S. Golf Association as a superior grass.

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### Stays Green In Summer Through Heat & Drought!

When ordinary lawns brown up in summer heat and drought, your Zoysia lawn stays green and beautiful. The hotter it gets, the better it grows. *Zoysia thrives in blistering heat (120°)*, yet it won't winter-kill to 30° below zero. It only goes off its green color after killing frosts, but color returns with consistent spring warmth. Zoysia is the perfect choice for water restrictions and drought areas!

### Now 3 Ways to Start Your Zoysia Lawn!

- 1) Freestyle Plugs** come in uncut sheets containing a maximum of 150-1" plugs. Freestyle Plugs allow you to make each plug bigger if you want-you decide. Min. size 1" sq.
- 2) New Super Plugs** are ready to plant-precut into individual 3 x 3 inch plugs. They arrive in easy to handle trays of 15 Super Plugs.
- 3) Amazoy Approved Seed-As** The Zoysia Specialists for 60+ years, we finally have a Zoysia seed available that meets our standards and homeowners expectations. Learn why at [zoysiafarms.com](http://zoysiafarms.com) or by phone at **410-756-2311**.

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Dept. 5274

| Freestyle Plugs You decide how big to cut the plugs. Each grass sheet can produce up to 150-1 in. plugs. Plant minimum 1 plug per sq. ft. |            |               |            |            |         | Super Plugs Precut plugs 3 inches by 3 inches READY TO PLANT Packed in trays of 15 Super Plugs. Plant minimum 1 plug per 4 sq. ft. |            |       |            |            |         |
|-------------------------------------------------------------------------------------------------------------------------------------------|------------|---------------|------------|------------|---------|------------------------------------------------------------------------------------------------------------------------------------|------------|-------|------------|------------|---------|
| Max Plugs*                                                                                                                                | Free Plugs | Grass Sheets* | Your PRICE | + Shipping | SAVINGS | Super Plugs                                                                                                                        | Free Plugs | Trays | Your PRICE | + Shipping | SAVINGS |
| 300                                                                                                                                       | —          | 2             | \$29.95    | \$14.50    | —       | 15                                                                                                                                 | —          | 1     | \$24.95    | \$8.50     | —       |
| 500                                                                                                                                       | +100       | 4             | \$50.00    | \$16.00    | 25%     | 60                                                                                                                                 | +15        | 5     | \$90.00    | \$20.00    | 34%     |
| 750                                                                                                                                       | +150       | 6             | \$66.00    | \$19.50    | 36%     | 95                                                                                                                                 | +25        | 8     | \$110.00   | \$30.00    | 47%     |
| 1100                                                                                                                                      | +400       | 10            | \$95.00    | \$30.00    | 43%     | 120                                                                                                                                | +30        | 10    | \$125.00   | \$35.00    | 50%     |
| 2000                                                                                                                                      | +1000      | 20            | \$165.00   | \$45.00    | 52%     | 180                                                                                                                                | +45        | 15    | \$180.00   | \$50.00    | 54%     |

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### DON'T FILL THE RIM

Pouring paint from a can always results in paint in the rim. When you tap the lid back on, paint splatters everywhere. To prevent this, just put a strip of painter's tape across the rim of the can before you pour.

**RICHARD MONDA**



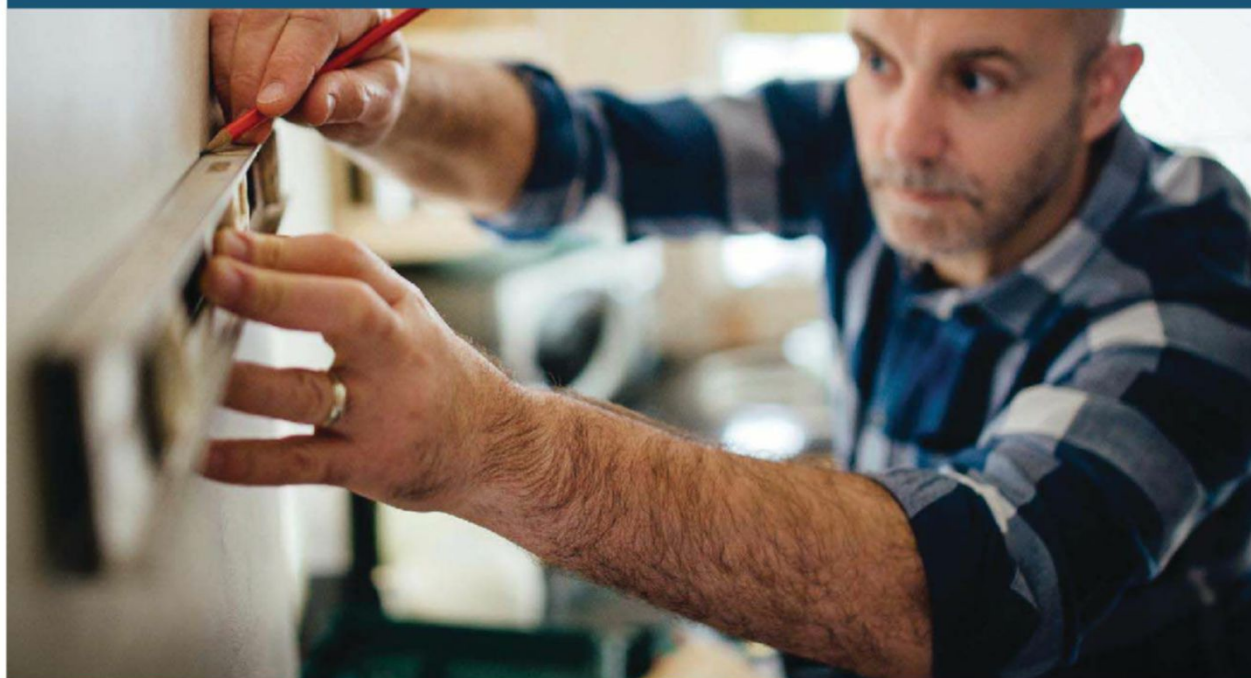
### Perfect Pilot Holes

If you're fastening moldings by hand (without a pneumatic finish nailer), you'll need to predrill a hole the diameter of the nail so you don't split the wood. If you don't have the right size drill bit, don't worry. Predrill using one of the finish nails. Simply clip the head off the nail with lineman's pliers or wire cutters. Then chuck the headless nail into the drill. This will give you the perfect size pilot hole every time.

**KEITH CLASEMANN**







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# Home Smarts

TECH | HEALTH | MONEY | MAINTENANCE & REPAIR | STORAGE & ORGANIZATION

## Make your shop smarter

"Alexa, order a drill bit sharpener!"



**A**s the owner of a tech design and development company, I like to "unplug" at the end of the day and tinker with my 1925 Model T or my BMW race car. I do have a computer in the garage to search

for parts or watch instructional videos on YouTube. I also use an Amazon Echo in the garage. I know this doesn't sound like unplugging, but just giving voice commands doesn't seem "techy" to me. Here are a few ways I use my smart speaker in the garage:



■ **INTERCOM:** Yeah, it's easy to pick up the phone or walk to the house to talk to my wife, but a smart speaker makes it even easier, provided you have a speaker in the house as well. I just say, "Drop in on (insert name)" and I'm instantly talking to my wife in the house. She can do the same to reach me in the shop.

■ **SHOPPING LISTS:** We've all thought of something but forgotten it before getting around to writing it down. With my smart speaker, I can create or add to shopping, task or idea lists as things occur to me without stopping what I'm working on.

■ **MUSIC:** I love putting my favorite music on playlists that I can access without touching anything. Or, if I'm doing quiet work, my smart speaker can instantly cue up an audiobook or a podcast.

■ **CLIMATE CONTROL:** Because I have a Wi-Fi thermostat in the garage, I can tell Alexa to turn on the heat or A/C half an hour before I head out to start working.

■ **DINNER ON DEMAND:** If I'm really buried in my work and don't have time to make a meal, I'll just tell Alexa to order me a pizza!

I've discovered that the various technologies don't play well together, at least not yet. I thought it would be great if Alexa could play YouTube videos on my computer on command. But Google reserves that privilege for its Google Home speakers. And Google Home can't order items from Amazon. Google doesn't want to help Amazon sell things, and Amazon doesn't want to help Google get more YouTube viewers.

I'm sure someday we'll be able to use smart speakers across any platform, for any task imaginable. For now, I'll settle for help with these simple tasks that can be impossible when I'm up to my elbows in differential fluid.

**ADAM GERKEN**  
**FLIGHTCIRCUITS.COM**  
CONTRIBUTING EDITOR



Share your  
fixes, heads-ups  
or DIY advice  
with us!  
submissions@  
familyhandyman.com

## PUSH STICKS PREVENT IMPALEMENT

**T**able saw kickback happens when a board trapped between the blade and the fence gets flung back at you after the cut is completed. The results can be dangerous, as you can see from the photo above. This particular mishap occurred while I was ripping 1/4-in.-thick splines for a hardwood floor. I made the mistake of using a push stick that was so shredded from overuse that the board kicked back and blew right under it, skewering my chair!

Fortunately, there are several ways to safely rip thin strips. One of the easiest methods is shown below. This push stick, more

accurately called a push block, somewhat resembles a shoe with a heel.

To make one, cut a notch in a 16-in.-long 2x6 a bit shallower than the thickness of the board you're ripping and about 12 in. long. The top—or sole—of the notch puts downward pressure on the board as it passes through the blade, preventing the board from being flung upward. The end of the notch—or heel—hooks over the end of the board. The block lets you to push the workpiece with your fingers safely away from the blade and keeps the board from being kicked back.

As you make the cut, be sure to slide the push block all the way past the blade to avoid a kickback involving the block!

**TRAVIS LARSON**, SENIOR EDITOR







## A Better Water Heater Option

**Q** *We've been getting high electric bills and want to replace our old electric water heater with a natural gas model. But I'm afraid that running the exhaust vent will be a hassle. Is there an easy way to do it?*

**MICHAEL BANKS, PORTLAND, OR**

**A** It's much easier to run the vent if you install a "power-vented" type of natural gas (or propane) water heater. This type of venting system is different from what you see on most gas water heaters. Most have a "natural-draft" type of vent (**photo above**), where the hot waste gases rise through an open draft diverter and into metal pipes, which eventually lead to the outdoors. Running one of these vents is complicated and may be expensive.

In contrast, a power-vented type (**right**) uses a fan to blow the exhaust gases out. Since this method doesn't rely on the natural buoyancy of hot air, the vent pipes don't have to go upward. They can run horizontally, which usually makes them much easier to install. Further, the fan dilutes the exhaust with cooler air so you can run the vents with easy-to-assemble PVC pipe. Power venting is an especially good solution for more energy efficient, tightly built homes, where a good natural draft is difficult to establish.

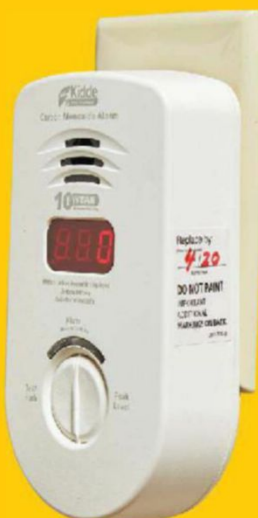
However, you should be aware of several drawbacks:

- You may notice the sound of the fan. Ideally the water heater will be in a room away from the main living area so it doesn't become bothersome.
- You have to provide a standard electrical receptacle near the unit to supply power for the fan.
- You have to be sure you have adequate "makeup" air to replace the air being blown out.
- And finally, power-vented water heaters cost at least 50 percent more than natural-draft water heaters. Figure somewhere in the \$450 to \$650 range, plus installation. You can find power-vented water heaters wherever water heaters are sold; almost every major water heater manufacturer makes them.

If you decide to install one yourself, read the instructions carefully and make sure to follow all venting procedures. Also, call your local building department to ask if you need a plumbing permit to do the work.

**GARY WENTZ**  
EDITOR-IN-CHIEF

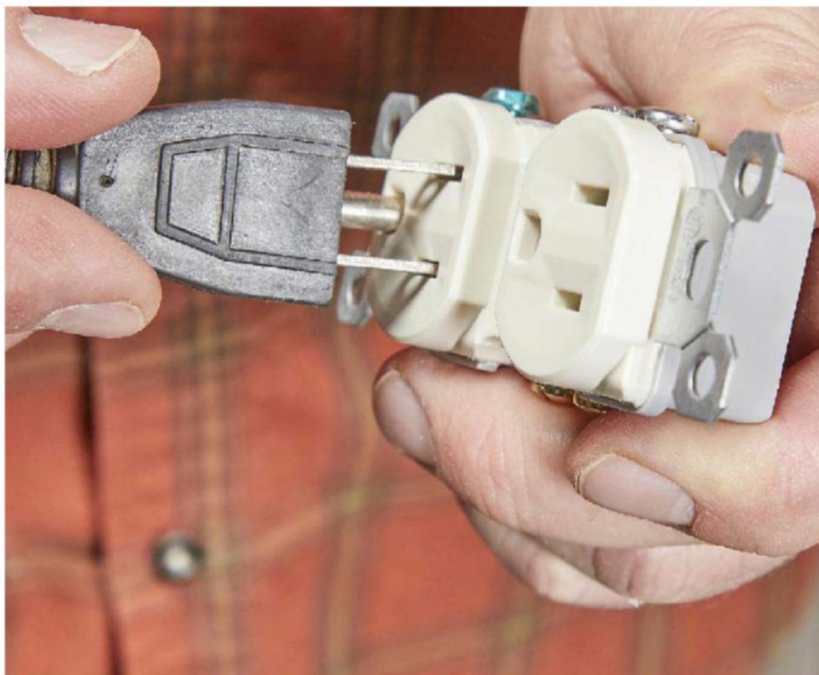




## When Should I Replace My CO Detector?

**C**arbon monoxide detectors have a life span of five to seven years. Before you install a new one, check the manufacture date on the back, then write the replacement date in permanent ink next to it. It's a good idea to set the calendar on your smartphone or computer to send you a reminder when it's time to replace CO detectors. Make it even easier by having them all due for replacement at the same time.

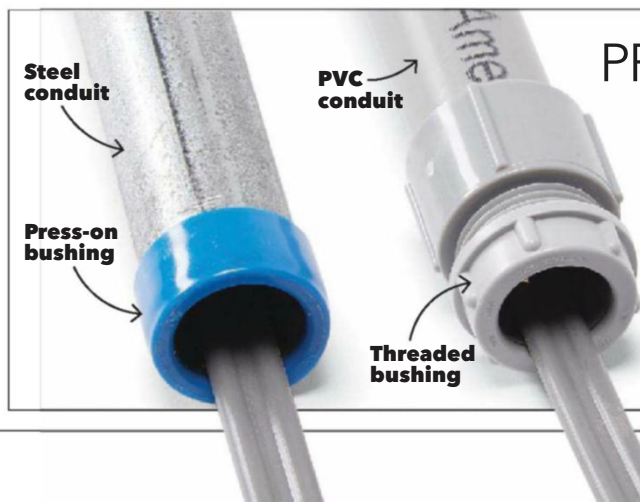
Install at least one carbon monoxide detector on each level of your home, and locate them near bedrooms. For more information, search for "CO detector" at [familyhandyman.com](http://familyhandyman.com).



## Do receptacles need replacing?

**O**ver time, the internal contact springs on electrical receptacles lose their spring. If you have a receptacle that doesn't hold onto plugs (**left**), it's time to replace it. If you want to reuse an old receptacle from your box of electrical supplies, check its grip first by plugging in a grounded plug that's in good condition (**above**). If it grips well and there's no corrosion on the terminal screws, the outlet is fine to reuse. To learn how to replace a receptacle, go to [familyhandyman.com](http://familyhandyman.com) and search for "replace receptacles."

**TRAVIS LARSON**  
SENIOR EDITOR



## PROTECT BURIED CABLE

**T**he end of a piece of conduit can be sharp enough to abrade electrical cable. Most installed cable doesn't move, but if it's buried, frost or settling may significantly move the cable. To protect the cable, all that's needed is a little bushing to create a smoother edge. For PVC conduit, a threaded end accepts the bushing. For steel conduit, use a press-on bushing.

**BRAD HOLDEN**  
ASSOCIATE EDITOR



# Should I Consider a Reverse Mortgage?

If you're retired and find yourself with unexpected medical or other expenses, or an inadequate retirement fund, the equity in your home could provide a crucial source of income, thanks to a reverse mortgage. Yet while they can be useful, reverse mortgages come with risks, so consider your situation carefully.

## WHAT IS A REVERSE MORTGAGE?

It's a type of loan offering retirees (only people 62 or older qualify) access to money without requiring regular monthly payments, and while remaining in their home. According to Peter Bell, president and CEO of the National Reverse Mortgage Lenders Association, you can draw down funds and defer any repayment until you pass away or decide to move.

## WHAT ARE THE DOWNSIDES?

"A reverse mortgage obviously helps the cash flow," Bell says, "but you still have the responsibility for maintaining the home and paying taxes, insurance and homeowner association dues. So, people need to make sure they'll have the resources to cover those expenses."

Federal Housing Administration insurance, which covers most reverse mortgages, guarantees that borrowers (or their heirs) won't owe more than what the house sells for when the loan is eventually



repaid. Still, keep in mind that repaying the loan will leave you with that much less equity should you decide to sell, or that much less to leave to your heirs.

## REVIEW YOUR OVERALL FINANCES

When considering a reverse mortgage, it helps to start with a detailed budget including all of your income and expenses, Bell suggests. Knowing what money you have coming in and going out each month can help you determine whether a reverse mortgage could fill the gap. This is a huge decision

with huge consequences. Before you sign any papers, sit down with a financial planner who has the skills to help you decide.

**CHARLES SLACK**  
CONTRIBUTING EDITOR



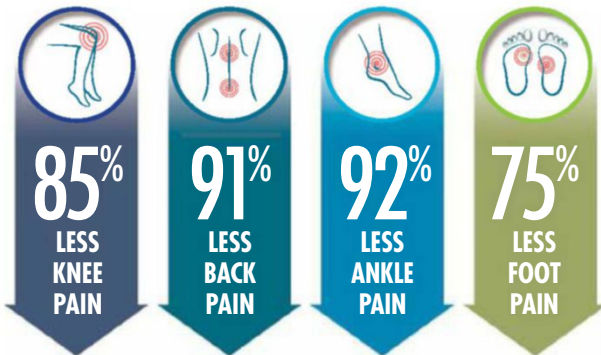


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# 3 Reasons to Filter Your Water

**W**hile the lead crisis in Flint, Michigan, raised serious questions about the risks in public water supplies, most supplies in the United States are very safe. Still, there are good reasons you might want to filter your home's water:

## HARD WATER

The dissolved minerals in hard water can make your laundry feel scratchy, decrease the efficacy of shampoo and soap, and affect your water's taste. Iron can stain your clothes and dishes, even at levels allowed by the EPA.

The solution: Install a whole-house system, which will filter every drop of city or private well water that comes into your home.

## SAFETY

While the water leaving your provider should be clean, the quality could decline before the water reaches your taps. Even the pipes inside your home could be to blame.

The solution: First, have your home's water tested to identify lead, pesticides, minerals, bacteria and other substances. The Environmental Protection Agency offers a list of certified water test-



ing labs on its website, [epa.gov](http://epa.gov).

In most cases, you'll only be concerned about your drinking water. That means a system connected to your kitchen faucet may be all you need and will save you lots of money compared with a whole-house system.

## BAD TASTE

It's the disinfectants added at the water treatment plant—often chlorine—that people generally find distasteful. "The chemicals are there for a good reason, but many people do prefer to have them removed," says Tom Bruursema,

associate executive director of the Water Quality Association. Once the water has reached your house, the chemicals have done their job and can safely be filtered out.

The solution: A simple under-sink filtration system removes chlorine taste and odor. But you might not need to install a filtration system. A simple NSF-certified pour-through pitcher filters out chlorine taste and odor, and costs \$30 or less. Some of these pitchers also filter out contaminants such as copper, cadmium and mercury. There are pitchers for about \$40 that remove lead.

**STEPHANIE THURROTT**  
CONTRIBUTING EDITOR

## WHOLE-HOUSE FILTRATION SYSTEM



## UNDER-SINK FILTRATION SYSTEM



## POUR-THROUGH PITCHER



For more information on choosing and installing water filters, search for "water filters" at [familyhandyman.com](http://familyhandyman.com).



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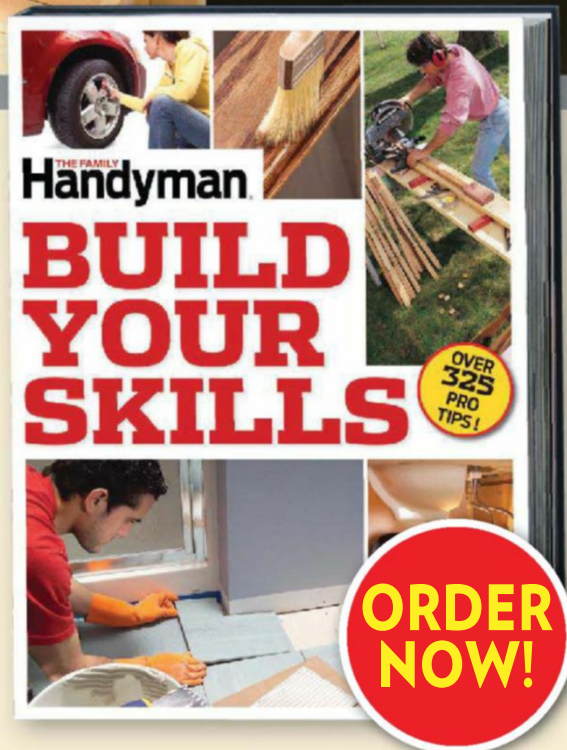
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# EASY *garden* ARBOR

**A small project that  
makes a big impression!**

BY JEFF TIMM

**T**his arch would make a beautiful portal to your yard or garden, and it's easier to build than most. Made from just six parts, it can be built in less than a day—even if you're a rookie carpenter. The design is versatile, too: It can support climbing plants, serve as a gateway in a fence, frame a walkway through a hedge, or stand alone as a striking wooden structure. You can stain it for a rustic look or paint it for a more formal one.





Figure A  
Garden Arbor

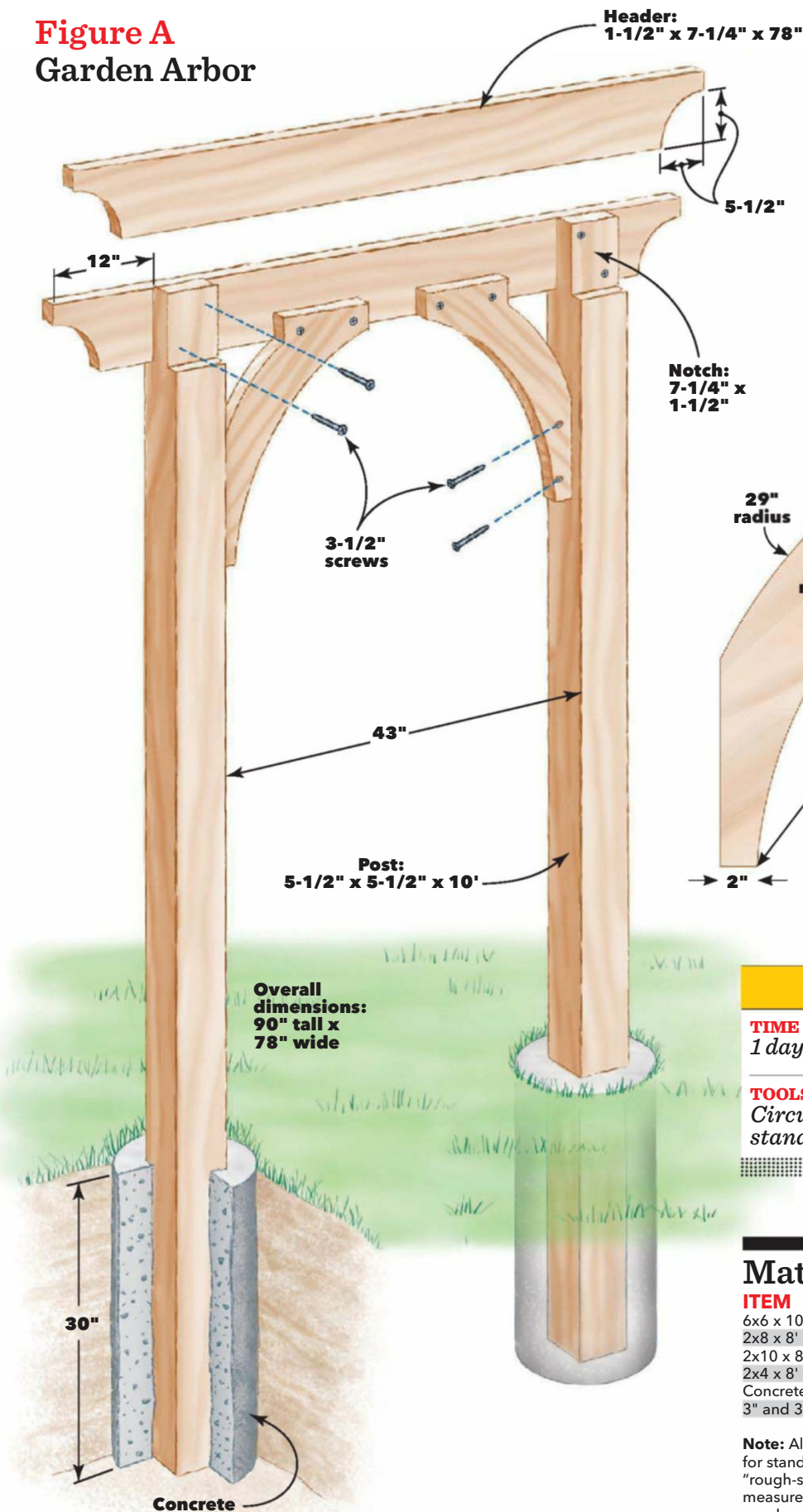
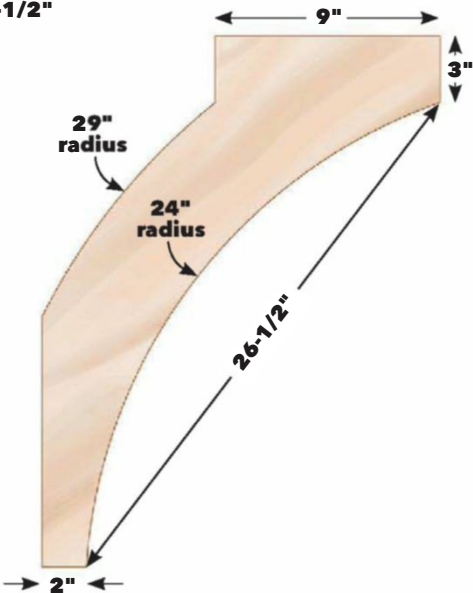


Figure B  
Bracket  
Detail



WHAT IT TAKES

| TIME  | COST  | SKILL LEVEL  |
|-------|-------|--------------|
| 1 day | \$250 | Intermediate |

**TOOLS**  
Circular saw, screw gun,  
standard hand tools

Materials List

| ITEM                                 | QTY. |
|--------------------------------------|------|
| 6x6 x 10' (posts)                    | 2    |
| 2x8 x 8' (headers)                   | 2    |
| 2x10 x 8' (brackets)                 | 1    |
| 2x4 x 8' (stretcher, stakes, braces) | 3    |
| Concrete mix (60-lb. bags)           | 3    |
| 3" and 3-1/2" screws                 |      |

**Note:** All measurements given in Figure A are for standard "surfaced" lumber. If you choose "rough-sawn" lumber as we did, some measurements will change slightly because rough-sawn lumber dimensions vary.



## Money and materials

The total materials bill for our cedar arbor was about \$250. Depending on where you live, you may have other varieties of rot-resistant lumber available, such as cypress or redwood. If you choose treated lumber, you'll find everything you need for this project at home centers.

For tools, you'll need only standard ones like a drill, a circular saw and a jigsaw. Make sure your framing square is a standard model (16 x 24 in., with a longer leg that's 2 in. wide). If yours is an oddball, buy a standard version (\$10) so you can easily mark out the brackets (see **Photo 2**). A few days before you dig the postholes, call 811 to have underground utility lines marked.

## Cut the parts

Begin by cutting notches in the tops of the posts (**Photo 1**). If you're using "rough-sawn" lumber as we did, you may have to change the length and depth of these notches to suit your 2x8 headers. (The dimensions of rough-sawn lumber vary.) Set the cutting depth of your circular saw to 1-1/2 in. to make the crosscuts for the notches. Then set your saw to full depth to make the other cuts.

Next, cut the 2x8 headers to length and mark arcs at the ends as shown in **Figure B**. To mark the curves, use the bottom of a 5-gallon bucket or any circle that's 10 to 11 in. in diameter. Cut the curves with a jigsaw.

The curved brackets may look complicated, but they're easy to



## 1 CUT THE NOTCHES

Notch the tops of the posts. Cut as deep as you can from both sides with a circular saw. Finish the cuts with a handsaw.



## 2 DRAW THE BRACKET ANGLES

Mark out the brackets without fussy measurements or geometry—just align the tips of the framing square with the edges of a 2x10 and draw the straight cuts on the bracket. (See **Figure B**, p. 34.)



## 3 DRAW THE CURVES

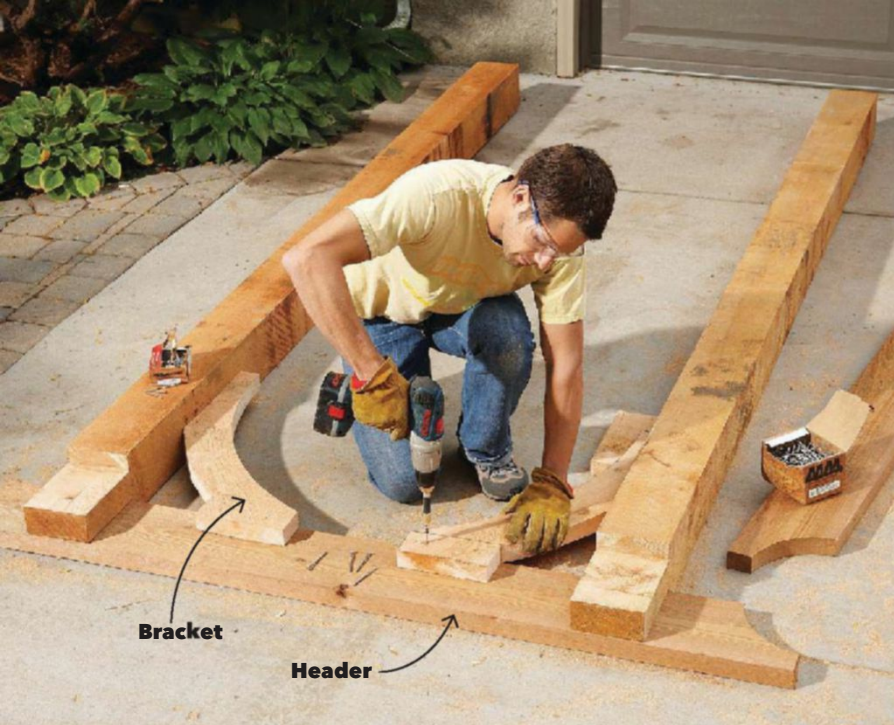
Draw perfect curves fast using a tape measure to guide your pencil. Cut out the bracket and use it as a pattern for the other bracket.



### CUT THE COST BY USING TREATED WOOD

If you use rough-sawn cedar for the entire arbor, the materials will cost about \$250. You can cut that bill roughly in half by using treated lumber, either green or brown. Brown treated lumber, which may also be available at the home center, looks a lot like cedar right off the bat—no staining required! Another advantage of treated wood is that it's much more resistant to rot than cedar.





## 4 ASSEMBLE THE PARTS

Screw through the posts and brackets into the header. That way, one header will have no visible screws. Screw through the second header into the posts.



## 5 STAND, PLUMB AND BRACE

Set the arbor level and plumb before you pour concrete into the postholes. Wedge shims under the stretcher until the header is level, then plumb and brace the posts.

mark out since they're based on a standard framing square. After marking with the square (**Photo 2**), set a nail in your sawhorse 20 in. from the edge of the board. Carefully adjust the position of the board until both corner marks of the bracket are 24 in. from the nail. Then, holding your pencil at the 24-in. mark on the tape, draw an arc. To draw the second arc, move your pencil to the 29-in. mark on the tape (**Photo 3**). Cut the straight edges of the brackets with a circular saw and the arcs with a jigsaw. If the curves turn out a bit wavy, smooth them with an orbital or a belt sander. Don't be too fussy, though. Nobody will notice small imperfections.

## Put it all together

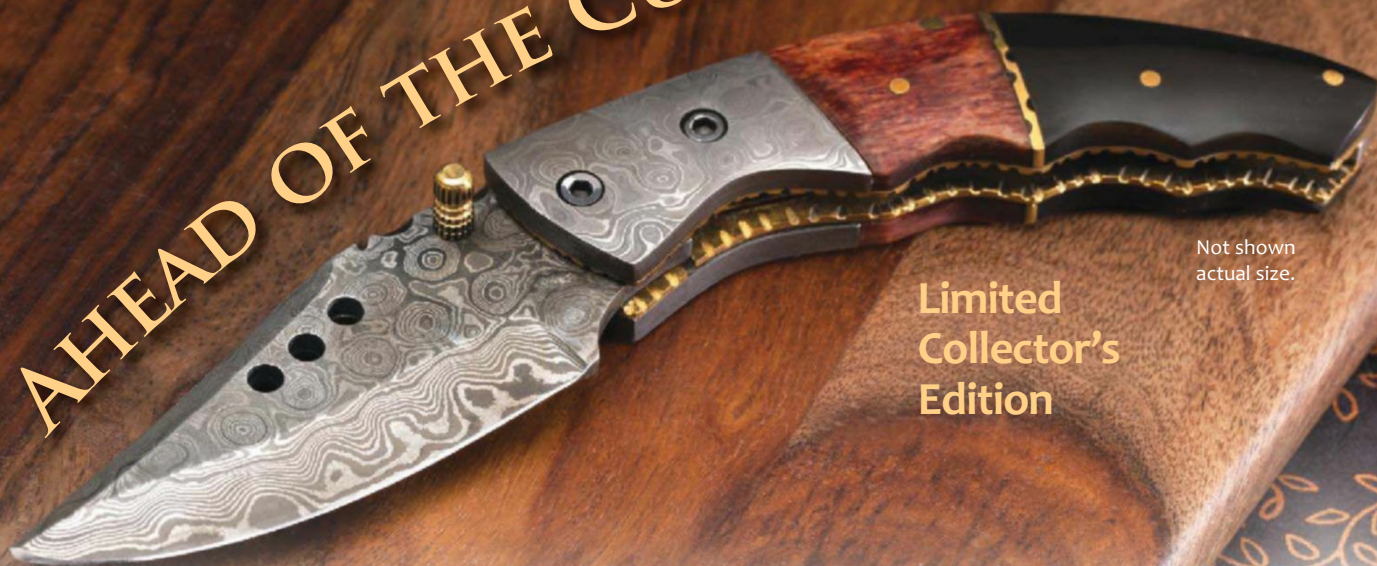
Mark one header 12 in. from both ends and lay out the posts, aligned with the marks. Take measurements at the other end to make sure the posts are perfectly parallel. Drive 3-1/2-in. screws through the posts and into the header. At the tops of the brackets, drive 3-in. screws at a slight angle so they won't poke through the face of the header (**Photo 4**). Set 1-1/2-in.-thick blocks under the other ends of the brackets. Then drive screws at an angle through the sides of the brackets and into the posts, drilling 1/8-in. pilot holes so you don't split the brackets. Set the second header in place and screw it to the posts. **Note:** The brackets aren't centered on the posts; there's a 1-in. gap between the second header and the brackets.

## Set it up

You'll set the arbor posts into 10-in.-diameter holes 30 in. deep. But before you move the arbor into place, screw on a temporary 2x4 "stretcher" 30 in. from the post bottoms. Then round up a helper or two and set the posts into the holes. Patiently level and plumb the arbor, bracing it with stakes and 2x4s (**Photo 5**). Be careful not to nudge the posts out of position as you fill the holes with concrete. Let the concrete harden for at least four hours before you apply finish to the wood. We brushed on two coats of clear penetrating wood finish to deepen the color of the wood and repel moisture.



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# *Backyard* SWING





# Easy enough for a beginner, comfortable enough for a long perch

BY GARY WENTZ

A seat like this is usually called a “porch swing,” and a porch certainly is a good location for it. But a hanging seat can go just about anywhere; unlike a chair, it doesn’t require a firm, flat surface beneath it. If you don’t have a suitable ceiling or tree to support a swing, go to [familyhandyman.com](http://familyhandyman.com) and search for “arbor” to see other options.

## Tools and materials

This swing design is especially forgiving. If your cuts are slightly inaccurate or not quite straight, the swing will still turn out just fine. So, although a table saw, miter saw and band saw are best for this project, you could do it all with only a jigsaw.

The swing shown here is made from cedar, but you could use treated lumber instead. Either material will contain some large knots, which can look bad and create weak spots. Avoid them when cutting parts (**Photo 1**). The Materials List includes 1x2s, but if you have a table saw, you’ll get better material by ripping 1x2s from wider boards. Some stores carry cedar that’s 7/8 in. thick instead of 3/4 in. If you use 7/8-in. stock, make the stretcher (E) 23-3/4 in. long instead of 24 in.

We chose heavy 5/16-in. yellow zinc-coated chain, but any chain rated for 250 lbs. or more will work. Some stores will cut chain to length for you. Two Quick Link connectors or S-hooks join the front and back chains to the upper chains—they make adjustments and removing the swing easy.



## WATCH THE VIDEO

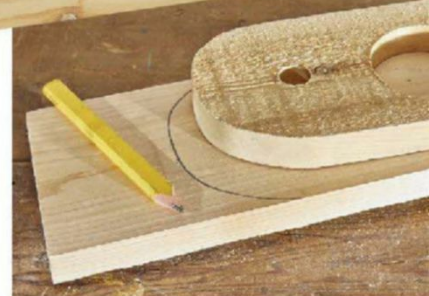
This swing was originally designed and built by April Wilkerson. To see how she made this swing and others, go to [wilkertos.com](http://wilkertos.com) and search for “porch swing.” April also sells templates (\$20) for marking the curved parts—fast, no-fuss and perfect.



**DANG!** One armrest is smooth and one is rough.

## THINK AHEAD WHEN WORKING WITH CEDAR

Cedar lumber usually has one smooth side and one rough side. So, when you’re making pairs of parts, it’s easy to end up with a mismatch: one part with the smooth side visible, the other with the rough.



**HOW TO AVOID A MISMATCH:** When using one part to mark its twin, place the smooth sides face to face.

### WHAT IT TAKES

| TIME  | COST | SKILL LEVEL |
|-------|------|-------------|
| 1 day | \$65 | Beginner    |

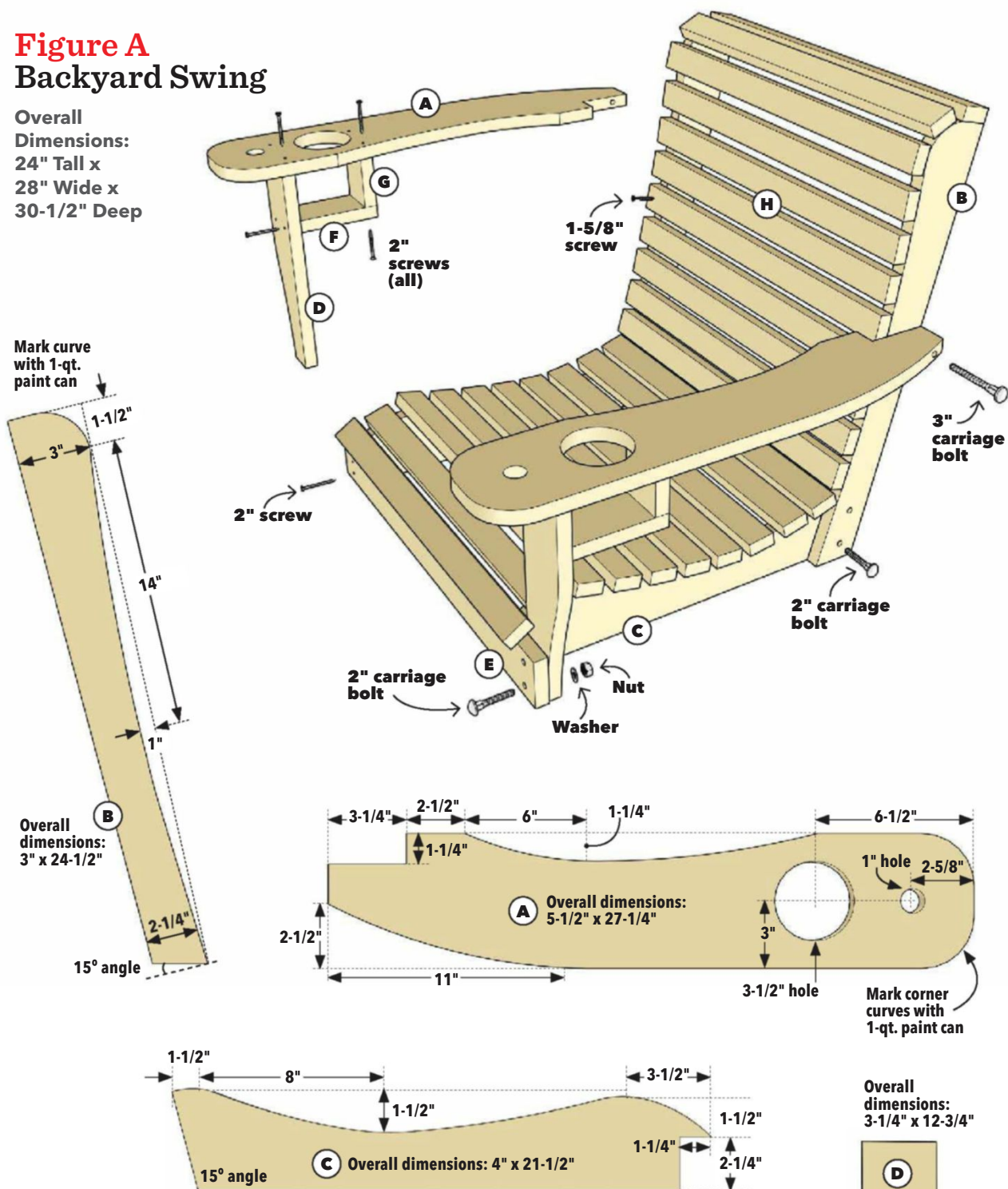
### TOOLS

Basic hand tools, drill, jigsaw



## Figure A Backyard Swing

Overall  
Dimensions:  
24" Tall x  
28" Wide x  
30-1/2" Deep



## Cutting List

| KEY | QTY. | SIZE & DESCRIPTION               |
|-----|------|----------------------------------|
| A   | 2    | 5-1/2" x 27-1/4" (armrests)      |
| B   | 2    | 3" x 24-1/2" (back supports)     |
| C   | 2    | 3-3/4" x 21-1/2" (seat supports) |
| D   | 2    | 3-1/4" x 12-3/4" (risers)        |
| E   | 1    | 2-3/4" x 24" (stretcher)         |
| F   | 2    | 2-1/2" x 5" (cup holder bases)   |
| G   | 2    | 2-1/2" x 4" (cup holder risers)  |
| H   | 21   | 1-1/2" x 21-1/4" (slats)         |

## Materials List

Everything you'll need is available at home centers.

| ITEM                             | QTY. |
|----------------------------------|------|
| 1x6 x 8'                         | 2*   |
| 1x2 x 8'                         | 6*   |
| 1/4" x 2" carriage bolts         | 8    |
| 1/4" x 3" carriage bolts         | 2    |
| 1/4" nuts and washers            | 10   |
| Quick Link connectors or S-hooks | 2    |

1-5/8" and 2" screws, chain, sanding supplies, wood finish  
\*Includes extra to allow for knots. With especially knotty lumber, you may need even more.

Two 8' lengths of chain are bolted to the front and back of the seat. The length of the upper chain will vary.



## Don't sweat the curves

This swing contains eight curved parts (A, B, C, D). Curved parts always make projects a bit harder, but don't be intimidated. The curves don't have to be precise. As long as they're similar to the curves detailed in **Figure A**, you'll get a comfortable, attractive swing.

There are lots of ways to mark out curved cuts. A "curve ruler" (\$8 online) is a good option for this project. Mark the ends and height of the curve (see **Figure A**). Bend the ruler so it aligns with the marks and holds that shape (**Photo 2**). After marking and cutting the curved parts, clamp them together for sanding (**Photo 3**). This ensures the parts will be identical.

## Sand and assemble

Ease the sharp edges of the parts by sanding or by using a router. A 1/4-in. round-over bit is one good option. Then sand all the parts before assembly; that's a lot easier than sanding afterward. You can prefinish all the parts or apply a finish after assembly. Deck stain or spar urethane is a good choice for exterior wood.

Begin assembly by bolting the risers (D) to the stretcher (E). Drill 1/4-in. holes, tap the lower carriage bolts into place and secure them with washers and nuts. Install the upper carriage bolts in the same way, but run the bolt through the chain. Next, bolt the back supports (B) to the seat supports (C). Join the three assemblies by driving screws through the stretcher and into the seat supports.

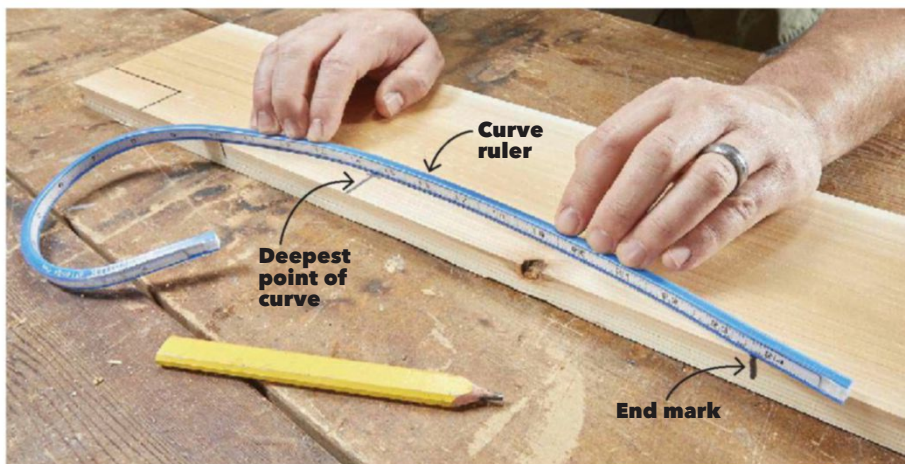
Now that the frame of the swing is complete, add the slats (H). Starting at the front of the seat, screw the first slat into place. Drill pilot holes to avoid splitting the wood. Then install a slat at the back of the seat. To fill in the remaining space, continue from back to front, positioning slats with a 3/8-in.-thick spacer (**Photo 4**).

Before fastening the last four slats, lay them out and check the spacing. You'll have to cut one slat to fit between the risers. You may need to increase or decrease the



## 1 SELECT THE BEST SECTIONS

Cut the large parts (A through E) from your best-looking wood and avoid large knots, which create weak spots.



## 2 MARK THE CURVES

Using a bendable "curve ruler" is one good way to mark curves. Just bend the ruler, aligning it with the ends and deepest point of the curve. Cut one of each part, then use those as templates for the twin parts.



## 3 GANG-SAND THE CURVES

Cut the curved parts with a jigsaw or band saw, then clamp the pairs together and smooth the edges with a belt sander or random orbital sander. A sanding drum quickly smooths the drink-holder cutout.





spacing slightly for a consistent look. Add the back slats, working up from the bottom and again adjusting the spacing of the last few slats. To complete the swing, screw the armrests (A) to the risers (D). Then, with the swing on a level surface, level and bolt on the armrests and chain (**Photo 5**).

## Hang it up!

If you want the seat to swing easily from side to side—not just back and forth—fasten the tops of the upper chains about 22 in. apart. If you want to reduce side-to-side movement, space the upper chains 28 in. apart or more. Be sure to leave the upper chains a little long so you can lower the swing if desired. You'll also want to adjust the tilt of the swing for comfort; that's as easy as moving the Quick Link connectors or S-hooks to raise or lower the back of the swing.

## 4 ASSEMBLE THE SEAT

Assemble the seat frame as shown in **Figure A**. Add the seat slats, using blocks to position them. Space the back slats in the same way.



## 5 ADD THE ARMRESTS

Screw the armrests to the risers. Level the armrests and drill a bolt hole through each armrest into the back supports. Feed the chain through the armrest hole and bolt it to the armrest.





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# HOW A TOILET WORKS

**Learn the basics so you can fix it yourself—and save!**

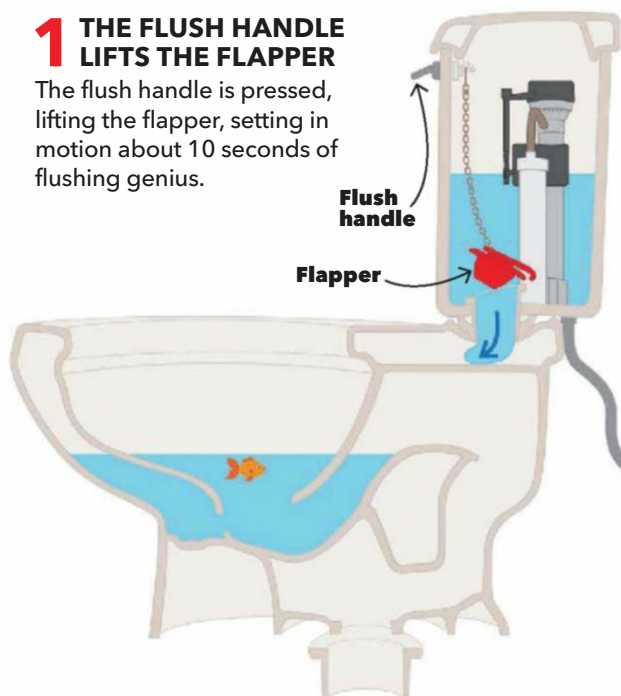
BY BRAD HOLDEN

**P**ossibly the most used yet most taken for granted household fixture, the toilet is a marvel of engineering simplicity. Even typical modern toilets still employ just a couple basic mechanical components. The rest of the flush relies on the natural forces of gravity and siphoning action.

But sooner or later, every toilet develops problems like weak flushing, clogs or constant running. When that happens, most homeowners just live with the problem or pay a plumber a lot for a simple fix. You don't have to. If you know how a toilet works, you can diagnose and solve problems yourself, often in just a few minutes. So let's lift the lid to see the magic that happens in the bowels of this under-appreciated fixture.

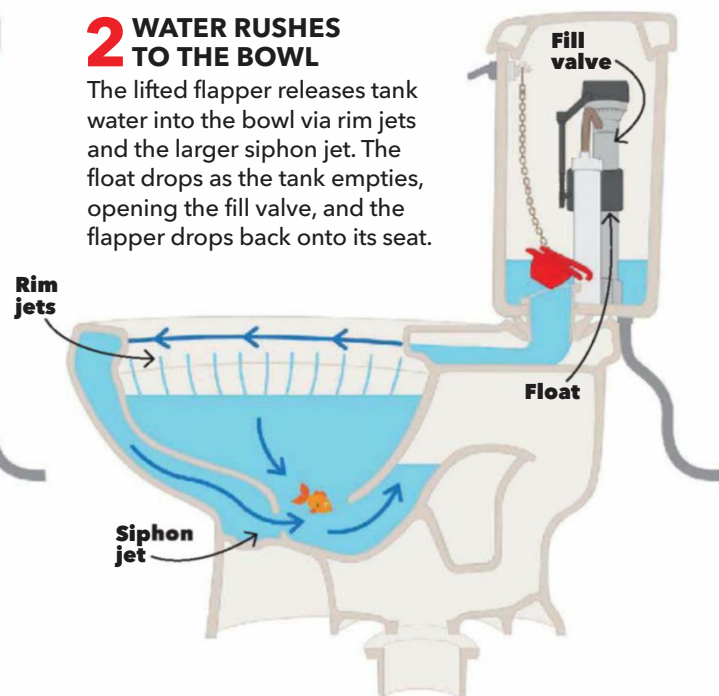
## **1 THE FLUSH HANDLE LIFTS THE FLAPPER**

The flush handle is pressed, lifting the flapper, setting in motion about 10 seconds of flushing genius.



## **2 WATER RUSHES TO THE BOWL**

The lifted flapper releases tank water into the bowl via rim jets and the larger siphon jet. The float drops as the tank empties, opening the fill valve, and the flapper drops back onto its seat.







#### TOILET HISTORY

The oldest known “flushing” toilet, located in a small castle on the island of Crete, is about 4,000 years old.

#### Watch the Video!

To see an animation of the flush and fill process, search for “how a toilet works” at [familyhandyman.com](http://familyhandyman.com). You’ll also find easy fixes for all kinds of toilet trouble.

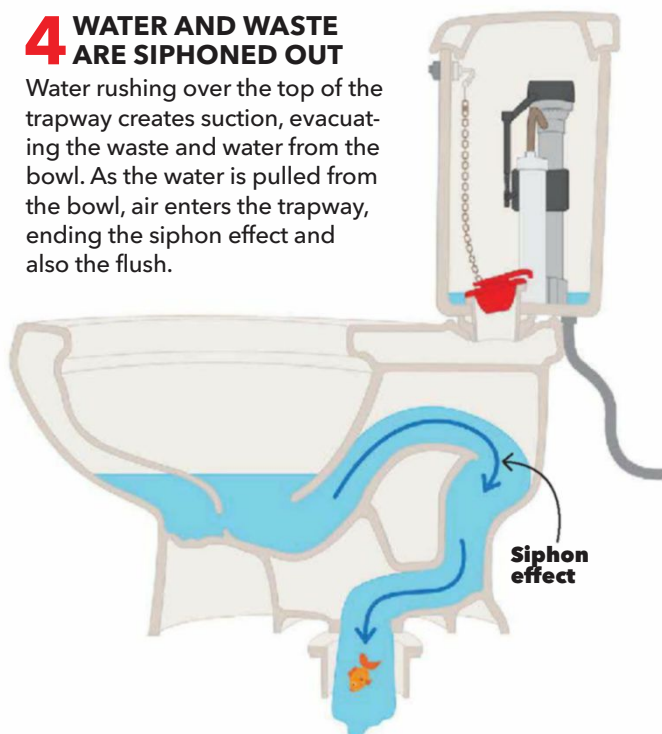
### 3 GRAVITY HAPPENS

The bowl fills, and gravity forces water into the trapway, causing it to overflow the top of the trapway.

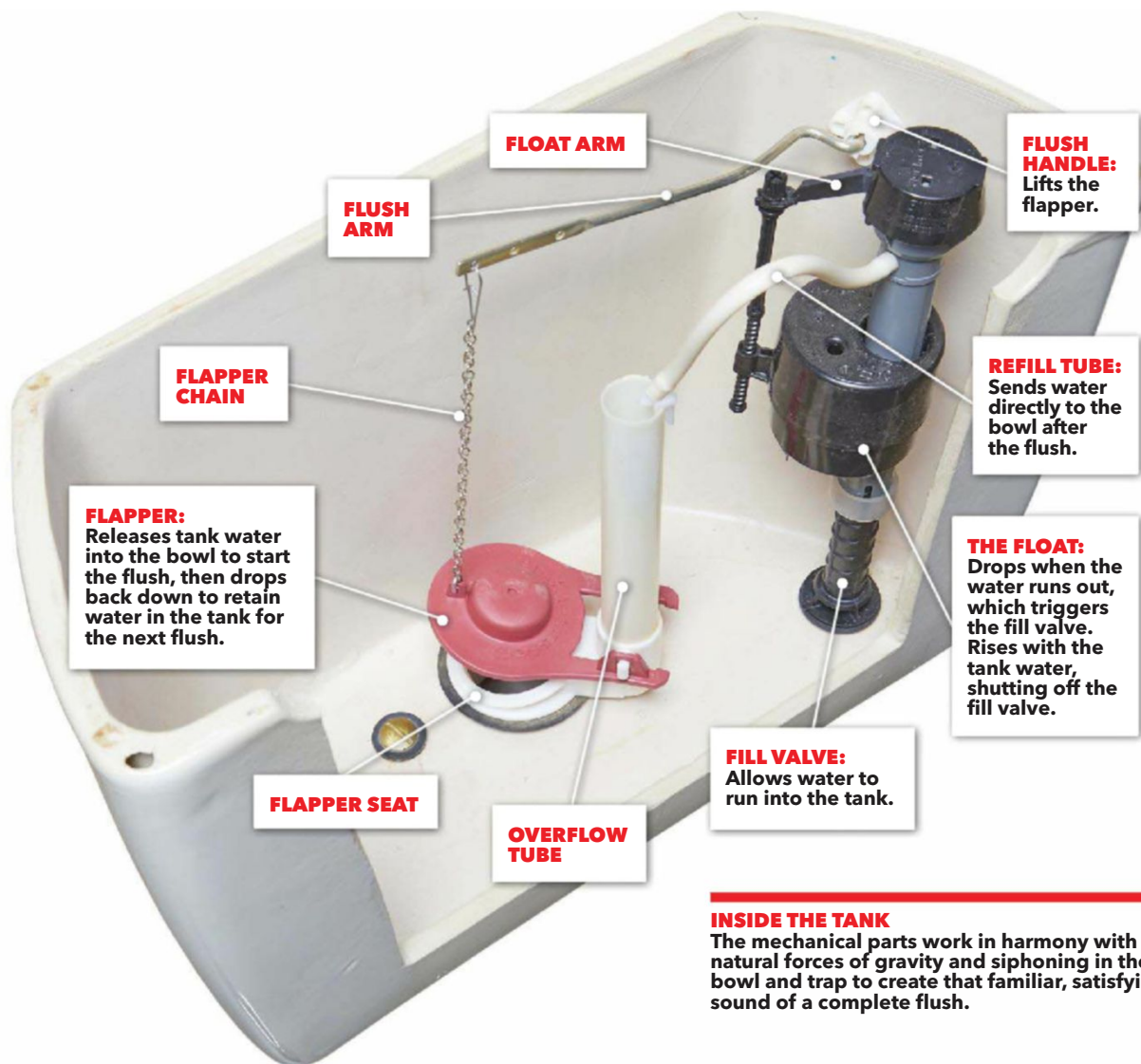


### 4 WATER AND WASTE ARE SIPHONED OUT

Water rushing over the top of the trapway creates suction, evacuating the waste and water from the bowl. As the water is pulled from the bowl, air enters the trapway, ending the siphon effect and also the flush.





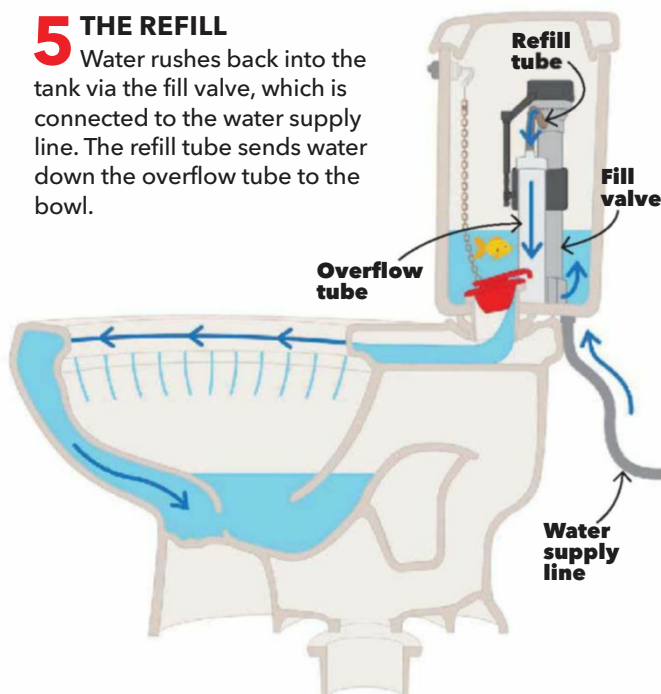


#### INSIDE THE TANK

The mechanical parts work in harmony with the natural forces of gravity and siphoning in the bowl and trap to create that familiar, satisfying sound of a complete flush.

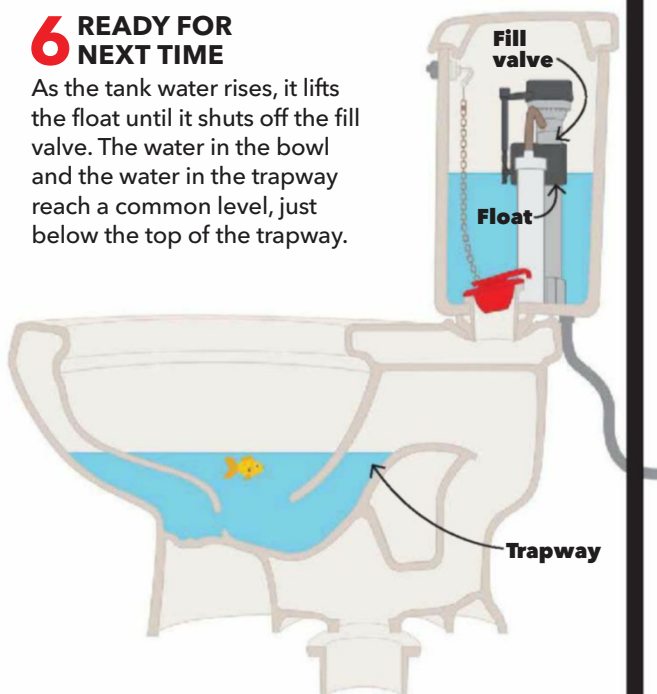
## 5 THE REFILL

Water rushes back into the tank via the fill valve, which is connected to the water supply line. The refill tube sends water down the overflow tube to the bowl.



## 6 READY FOR NEXT TIME

As the tank water rises, it lifts the float until it shuts off the fill valve. The water in the bowl and the water in the trapway reach a common level, just below the top of the trapway.







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# INSTANT KNIFE RACK

1-HOUR PROJECT

An easy-access organizer made from one board

BY TRAVIS LARSON

**T**his clever knife rack can be sized to suit any cabinet door and any cutlery set. And aside from waiting for glue and the finish to dry, it takes less than an hour to complete. The following pages detail the process. Here are pointers to help you along:

- Cutting the slots (**Photo 1**) requires you to remove the blade guard. Be careful!

- Our knife rack is finished with a couple of light coats of aerosol spray lacquer, but you can choose any finish you like.

- Wood shrinks and swells with changes in humidity. To allow for that movement, make sure the screw holes in the knife rack (**Photo 6**) are slightly larger than the screw diameter. When you drive the screws, make them snug but not super tight.

- If you mount this rack on a lower cabinet door and have toddlers around, you'll also need a childproof latch. There are several options costing about \$3 at home centers and online.

## WHAT IT TAKES

| TIME   | COST       | SKILL LEVEL |
|--------|------------|-------------|
| 1 hour | Under \$10 | Beginner    |

### TOOLS

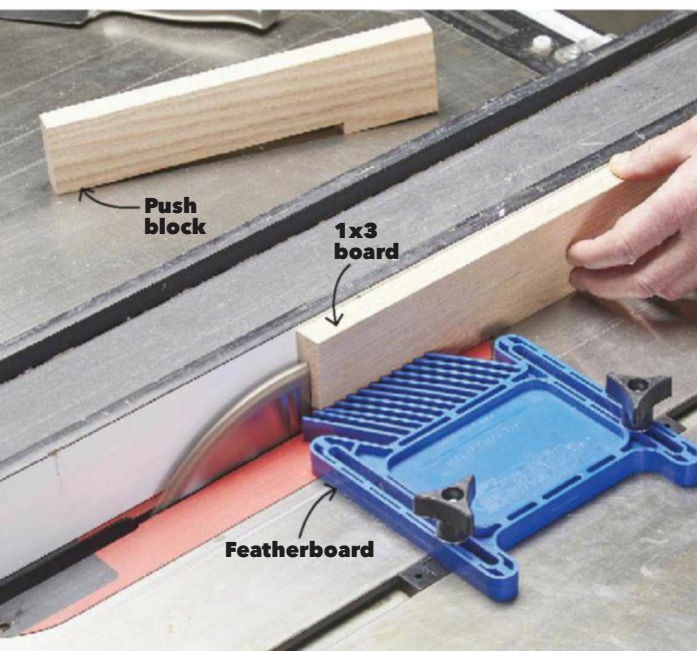
Table saw, two bar clamps, drill/driver

### MATERIALS

A 6-ft. 1x3 board, glue, finish, 1-1/4-in. screws, finish washers







## 1 CUT THE KNIFE SLOTS

Set your saw blade to cut 1 in. deep. Center the blade in the board and make a pass. Flip the board end for end and make another pass to center the slot. Raise the blade to 2 in. and repeat. Be sure to use a featherboard and push block for safety. Cut the board into six 10-in. lengths for a 16-in.-wide door.



## 2 MARK THE END BOARD

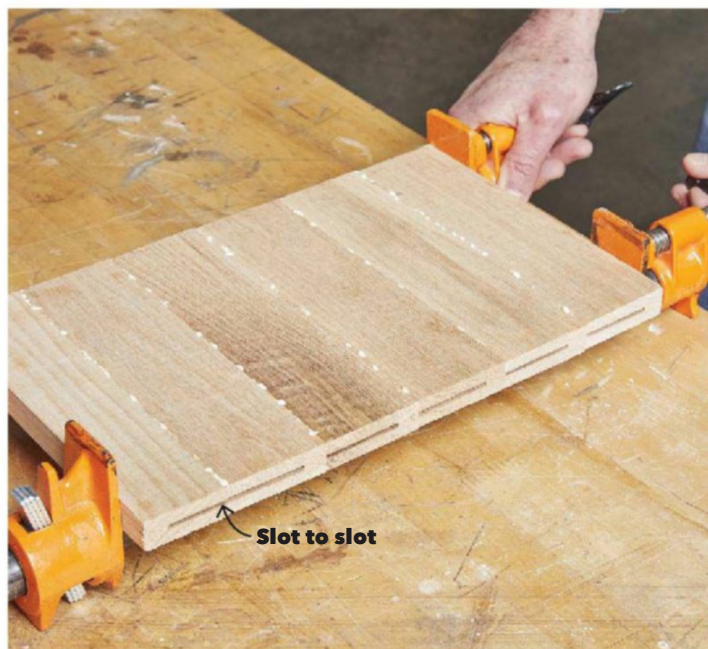
Remove the door from the cabinet so you can work flat. Space one edge of the assembly 3/4 in. from the door edge and mark the rip cut on the other side with another 3/4-in. block. (This allows clearance for the door to close.) Rip the end board to width.

**NOTE:** Start your glue-up ASAP after cutting the slots. If you wait too long, the thin sections of the wood may begin to warp.



## 3 GLUE THE SLOT EDGES

Apply a bead of glue to the edge on each side of the slots. Don't use too much or the excess will squeeze out into the slots.



## 4 CLAMP IT UP

Flip the end board you ripped so that the last two boards are slot to slot. Clamp the boards for at least 30 minutes. Scrape away the glue squeeze-out with a chisel after it's jelled but before it's hardened.





## 5 TRIM THE EDGES

Attach a fence to the miter gauge and trim the edges square. Sand the surface flat and smooth. Open-grain woods like this oak only need to be sanded to 100-grit. Finish to suit your tastes.



## 6 MOUNT THE KNIFE RACK

Predrill 1/8-in. holes through the rack and the door frame. (Be careful not to drill through the door front!) Add 1-1/4-in. No. 18-8 screws with finish washers and rehang the door.



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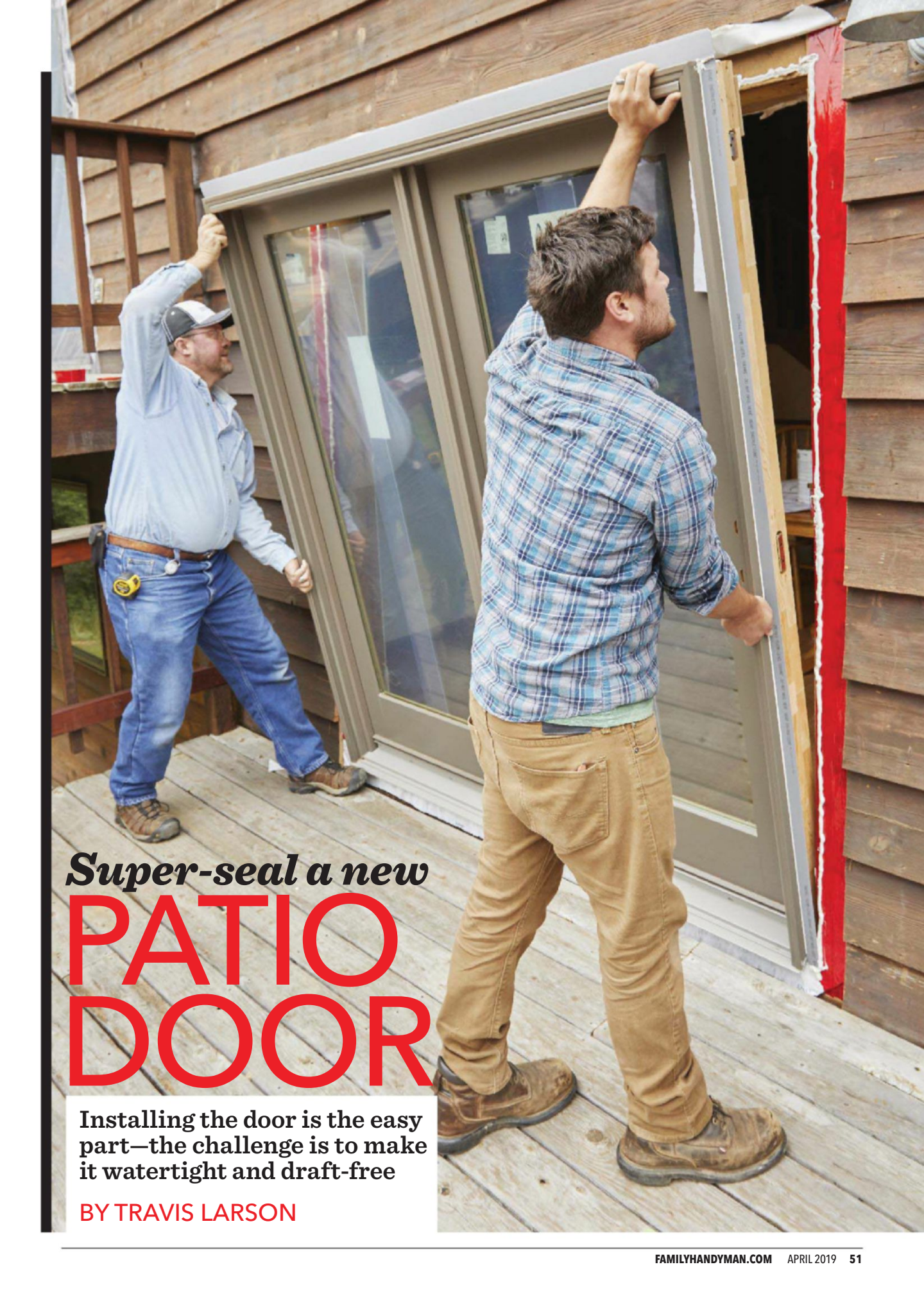
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A full-page photograph showing two men installing a large glass patio door. The man on the left, wearing a light blue shirt, jeans, and a baseball cap, is holding the top left corner of the door frame. The man on the right, wearing a blue and white plaid shirt and tan pants, is holding the top right corner. The door is being set into a wooden deck. A red vertical strip of material is visible on the right side of the door frame. The background shows the wooden siding of a house.

## *Super-seal a new* **PATIO DOOR**

Installing the door is the easy part—the challenge is to make it watertight and draft-free

BY TRAVIS LARSON





## 1 POSITION THE DOOR

After tearing out the old door, place the new door in the opening so that it's centered, square and plumb. Use a scrap of trim to mark the siding.



## 2 CUT THE SIDING

Align the cutting jig 1/4 in. outside the marks (to allow a caulking gap on both sides of the wood trim later) and screw the jig to the siding. Make a shallow pass, adjust for a deeper one, and make deeper and deeper passes until the siding will snap free with a flat bar or finger pressure. Clean up any leftover projections with a utility knife.

The instructions that come with a patio door cover the basics but often gloss over the most difficult—and critical—part of a replacement job: cutting back the siding and establishing a weather-tight “drain plane.” (More on that term later.) If you get it wrong, you’ll end up with a drafty door, serious water damage and a project do-over within just a few years. So instead of rehashing the basics, this article will show you how a leading expert achieves a watertight, draft-proof installation that will last for decades.

### Drain plane basics

A drain plane is a waterproofing barrier that’s a combination of metal and flexible, adhesive-backed flashing. It keeps water from penetrating around the patio door, and along with the water-resistant barrier (WRB), keeps water from reaching the house’s sheathing, framing and wood door parts, which are all vulnerable to rot.

In older homes, the WRB is felt paper; in newer homes, it’s a vapor-permeable membrane (Tyvek is one common brand). The purpose of a WRB is to prevent

*Continued on p. 54*



**MEET THE EXPERT**  
Kurt Dalquist is a technical leader at Andersen Corporation with a focus on installation. Kurt has worked at Andersen for 21 years and has installed hundreds of doors and windows.



## THE RIGHT MATERIALS

Everything you typically need to install a weathertight door is available at home centers for a total of about \$150.

■ **Door trim:** Plan to get 3-1/2-in. or wider trim to finish around the door (**Photo 9**). We bought rough-sawn cedar 2x4s for this installation to match the siding. If you have cement board, Masonite siding or stucco, get cement board or other synthetic trim. If you have vinyl, aluminum or steel siding, you'll need three 10-ft. lengths of color-matched J-trim. (You won't be able to nail it into place, but you can tuck it in behind the siding and secure it with caulk.)

■ **One roll of 9-in. self-adhesive flexible flashing:** You'll use this on the floor under the doorsill (**Photo 3**) and wrap it down around the corners (**Photo 4**) for a continuous water barrier.

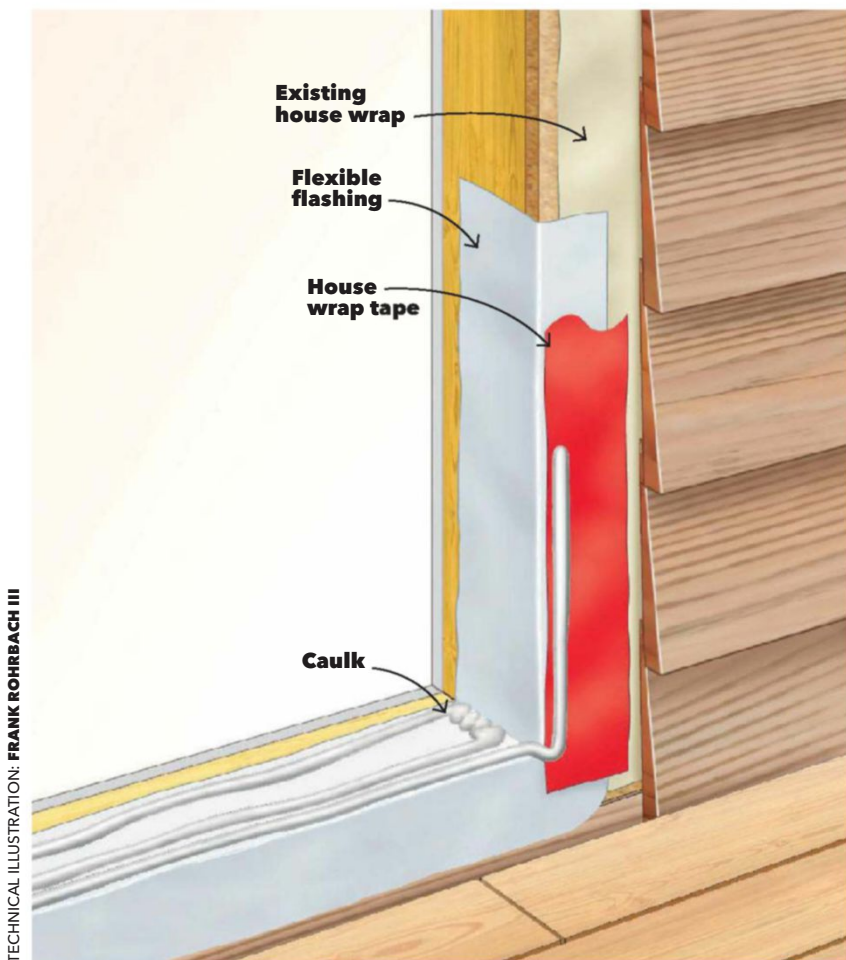
■ **House wrap tape:** Use this to bolster the existing house wrap (**Photo 5**). It'll cover tears and holes, fill in missing areas and give you a better surface for adhering the flashing tape.

■ **4-in. flashing tape:** This tape runs over the installation flanges at the sides and over the door (**Photo 8**).

■ **Caulk:** Buy five tubes of siliconized acrylic for sealing under the threshold, behind the installation flanges (**Photo 6**), and the joint between the flanges and the door. Buy two tubes of color-matching or paintable exterior caulk to fill the gaps on both sides of the trim (**Photo 9**).

■ **Drip cap flashing:** Your new door will come with drip cap flashing for directly over the door (**Photo 9**), but you'll need one more piece at least 7 ft. long to put over the trim at the top. Be sure you buy one that's deep enough to drape over the trim thickness you select.

## Figure A Threshold Flashing



TECHNICAL ILLUSTRATION: FRANK ROHRBACH III



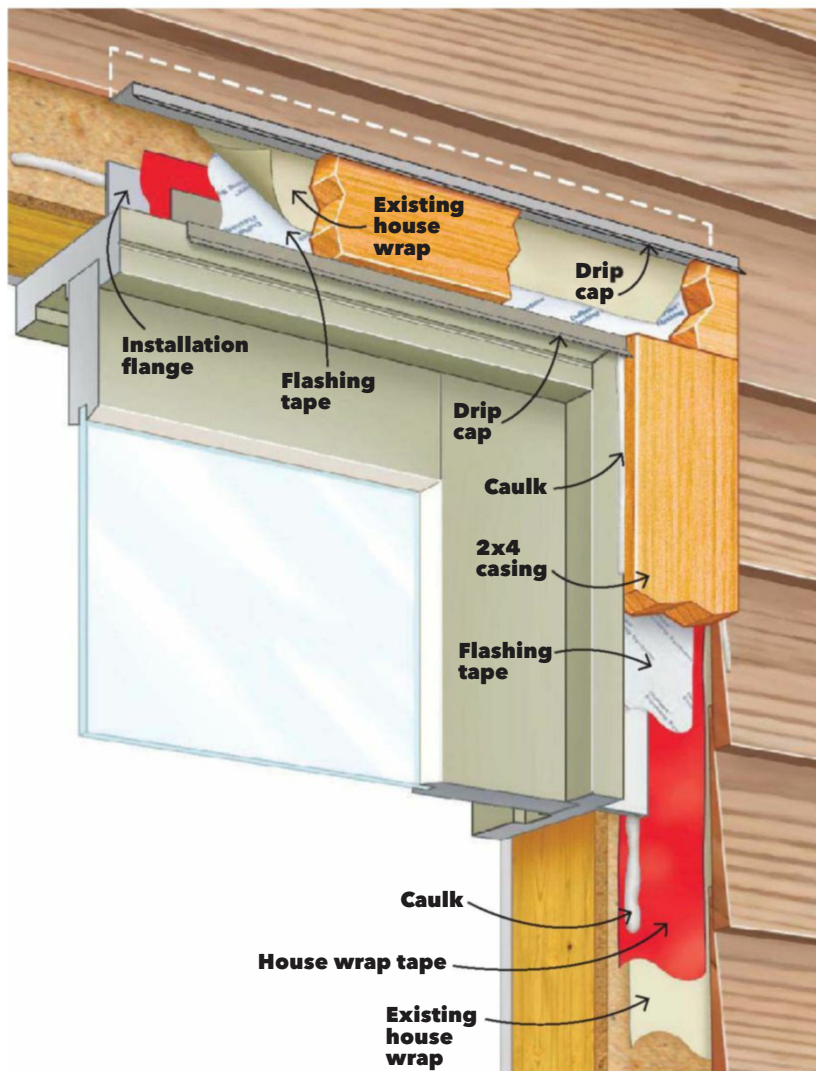
## 3 LAY THE SILL FLASHING

Cut the flexible flashing long enough to project up the sides about 8 in. Peel away the backing, then center the flashing in the opening and tuck the ends tight into the corners. Press the flashing against the flooring with a laminate roller or rub it with the edge of a 2x4 block.



## Figure B

### Door Flashing



water from penetrating the sheathing and framing. If the drain plane isn't done properly, it's very common for subfloors, rim joists and wall framing and sheathing to rot. And you won't know that's happening until years later when you have expensive, labor-intensive repairs.

### Buying the door

Pull the interior trim from around your old door and take width and height measurements for the rough opening. Take that information to the store to help you choose a door that will fit in the opening so you don't have lots of ugly reframing to do. You don't have to stick with the same door style. Choose a sliding, French or center-hinged swinging door (like the one shown). It doesn't matter as long as the door fits in the opening. If the brick molds are optional, don't special-order them—you won't be using them and probably won't be able to return them.

### You can't just follow the instructions

Patio doors have installation flanges (**Photo 7**) on the sides and top that project away from the door frame. They're used to seal the door and to aid in positioning. It's virtually impossible to work them behind the house cladding (that is, the siding or stucco) to waterproof the door and the water-resistant barrier (WRB) when you're trying to slip the door into the opening. In almost all cases, that means the cladding has to be cut back to allow the flanges to seal against the WRB so you can cover it with flashing and keep the installation waterproof.

### Cutting back the siding

Dry-fit the door, plumb and centered, in the opening to make sure it fits and to use it as a guide for marking the siding for cutting. In **Photo 1**, we show you how to mark the siding using the trim as a guide. Don't try to freehand the cut or you'll cut through and



## 4 FOLD DOWN THE CORNERS

Stretch the flexible flashing to drape it down and around the corner. If the weather is cold, a heat gun set on low will help you form the flashing, but wear gloves so you don't get burned. The bottom edge should overlap the siding below.



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compromise the existing house wrap or felt paper. Instead, build a jig that you can screw to the siding and use as a circular saw guide for a perfect cut. (To find out how to build the jig, go to [familyhandyman.com](http://familyhandyman.com) and search for “circular saw cutting guide.”) Sneak up on the depth until you’re almost, but not quite, through the siding (**Photo 2**). Snap off the siding or finish the cut with a utility knife. If you have stucco, use a diamond blade; cement siding, a cement board blade; steel or aluminum, a metal cutting blade. If you have vinyl, just use tin snips.

## Applying the flashing

The photos in this story show you the exact steps you’ll need for a waterproof installation in the situation we faced. But you’re bound to run into some head-scratchers. The important thing to remember is to think like a raindrop! Every layer of waterproofing membrane should overlap the one below it, like shingles do. So always work from the bottom up. You can use aluminum flashing to tuck behind the siding or rubber flashing when you need to cover holes or saw miscuts in the WRB.

If you use rubber flashing, leave the removable covering in place if you need to, because you’ll never be able to slip it behind anything once the sticky side is exposed. Use staples when necessary to hold things in place, but place them so they’ll be covered by flashing if possible. Don’t beat yourself up! A couple of staple holes aren’t going to destroy your house.

## How long does it take?

We installed this door at my neighbor Ed’s house. Including the time to set up for the photos (plus lots of yakking and lunch), the job took about six hours. A few days later, Ed and I installed an identical door upstairs in exactly four hours. Full disclosure: He had the old door torn out when I showed up, but that only took him 30 minutes. He still has the interior trim to install, but I’m not helping him with that. I’m sure he’ll be borrowing my trim gun ... again.

*Continued on p. 58*



## 5 REINFORCE THE HOUSE WRAP

Cover the existing house wrap with house wrap tape to make it stiffer, cover any holes and tears, and extend the WRB all the way to the opening. Cut the WRB at a 45-degree angle at each corner at the top, then staple the house wrap over the door out of the way.



## 6 APPLY THE SEALANT

Apply three beads of caulk on the flexible flashing and lay a thick bead of additional caulk at each bottom corner. At the sides and top of the rough opening, apply a 3/8-in.-thick bead 1/2 in. in from the edges. (Read your installation manual for caulk spacing recommendations.)





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Installation flanges

## 7 SET THE DOOR

Rest the bottom of the door on the sill and tip it into place, embedding the installation flanges well in the caulk. Center, plumb and square the door, then shim and screw it into place following the installation instructions for the door.



## 8 APPLY THE FLASHING TAPE

Scrape away any caulk squeeze-out and add the drip cap over the door. Stick the flashing tape over the flanges and the house wrap tape on the sides first, then the top. The flashing tape should underlap the house wrap at the top. Drape the house wrap down over the drip cap and tape the 45-degree end cuts.



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## 9 INSTALL THE UPPER DRIP CAP AND THE TRIM

Cut the drip cap to extend all the way to both ends of the cut siding and slip it behind the siding. The siding should hold it in place. If it doesn't, anchor it with a bead of caulk along the bottom. Add the door trim and caulk both sides of the trim along the siding and door.



## 10 APPLY FOAM

Fill the space between the door frame and the framing with minimal expanding foam. Let it set overnight and cut away the excess before you trim the interior.

## MORE DOOR HOW-TO

For more on patio door replacement and repair, search for "patio door" at [familyhandyman.com](http://familyhandyman.com).

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# Best ProTips

Expert advice from the job site. By Travis Larson



## PREP A DECK FOR STAIN

**P**reparing an old deck for stain is easy; chemicals do most of the work. But it's not a job that allows for shortcuts. If you break a few basic rules, your finish will fail fast and you'll be back for a redo. Here's how to do it right.



### MEET THE EXPERT

Rick Bautista, a senior product manager at Behr Process Corp. for the past eight years, specializes in wood stains and finishes.





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## BEST PRO TIPS



### Pick up a deck stripper and a cleaner

To prepare your wooden deck for restaining, you'll need to pick up these two types of products from a hardware store or home center:

**DECK STRIPPER** removes the old stain. An average-size deck will require about 2 gallons at \$20 each.

**DECK CLEANER** gets rid of stripping residue, refreshes the surface of the wood and opens the wood pores to better receive the new stain.

#### CAUTION:

The two types of products used to prep a deck contain hazardous chemicals. Deck cleaner is actually an acid, and the stripper contains a caustic chemical that will burn your skin. Wear long pants, eye protection and rubber gloves. Above all, avoid skin and eye contact.



### 1 TEST THE EXISTING STAIN

Water-based (acrylic) stains must be stripped off before you apply a new finish, while oil-based stains can be recoated after you use a deck cleaner. So, your first step is to determine which type of stain is on the deck. Apply a small amount of deck stripper to an inconspicuous spot. Let it sit for about 15 minutes, then wipe it off. If the stain comes off, the stain is a water-based product and you'll have to strip it off. If the stain doesn't come off, it's an oil-based product that can be recoated with an oil-based deck stain once properly cleaned. If you have a deck that's never been stained, just go right to the steps shown in **Photos 8 and 9**.



### 2 PROTECT PLANTS AND SIDING

Deck stripper and cleaner can kill grass and plants. Protect vegetation with a fabric drop cloth or light-colored tarp. (Clear plastic sheeting will trap heat from the sun and fry your plants.) Then wet down the siding near the deck using your garden hose. Wet surfaces are less likely to be damaged by splashes of stripper. Clean off all loose deck debris with a push broom or leaf blower.





### 3 APPLY THE STRIPPER

Shake the deck stripper and pour it into a paint tray. Working in small sections, roll on a thick coating using a 1/2-in. or 3/4-in. nap roller and an extension pole. Use a paintbrush to get stripper on areas that can't be reached with the roller. If you splash stripper onto your siding, wash it off right away.



### 4 KEEP THE STRIPPER DAMP

Let the stripper work its magic for 15 minutes. If the stripper starts to dry during this period, keep it damp with water from a pump-up sprayer.



### 5 SCRUB AWAY THE DISSOLVED STAIN

Scrub with a stiff-bristle broom. If you have thick layers of stain, you may need to scrape off the residue with a floor scraper first. If that's the case, you'll likely have to reapply more stripper for the scrubbing step.



## BEST PRO TIPS



### 6 POWER-WASH THE STRIPPER

Rinse off the stripper and dissolved stain using a stiff stream from a garden hose nozzle, or a pressure washer on the lowest setting. A pressure washer makes the job much easier. If you only have a garden hose, you'll have to scrub more as you rinse.



### 7 SAND THE STUBBORN SPOTS

Let the deck dry. Areas that need additional treatment will be obvious. Repeat the stripping/scrubbing routine on those spots. If there's no improvement after a few rounds, sand those areas with a random orbital sander.



### 8 CLEAN AND NEUTRALIZE THE DECK

Clean the deck with a deck cleaner. Mix a 50/50 solution of water and cleaner if your wood is reasonably clean. For extremely weathered boards, try the cleaner at full strength. Experiment with a small area to determine which is better. Wet the wood with your garden hose and apply a liberal coating of the cleaner using a pump sprayer. Let the cleaner sit for 10 to 15 minutes and keep it damp before scrubbing with a stiff-bristle broom. Then rinse the entire deck and let it dry.