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p. 50

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HOW TO BUY
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LAWN TRACTOR

ON THE COVER

Make waves with this unique, beautiful bench. It's a masterpiece you can build in a few afternoons. Photographed by Tom Fenenga



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DIY Universe

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Stuff We Love

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



SMALL-SPACE SOLUTION

Sweet Little Sucker

I have a big shop with a dust collection system, two wet/dry vacs and an 18-in. broom for cleaning up. So I wondered, "When am I ever going to use a pint-size tool like the Milwaukee 18-volt vacuum?" The answer was "hourly."

The M18 Compact Vacuum 0882-20 isn't a wimpy broom-closet hand vac—it's a real tool. I took it for a test drive, and powered by the 5.0-Ah battery pack, it

worked full tilt for 28 minutes before sputtering. I used it to vacuum floors and drawers, suck up dust around stationary tools, clean off my workbench, get dust out of cabinet crevices and remove sawdust from my clothes. I even connected the hose to my random orbital sander and put it to work as a point-of-use dust collector.

With two 1-ft. extensions and the floor tool attached, the vacuum

easily picked up sawdust and wood chips. At 6 lbs., it's light enough to maneuver easily. It has a HEPA filter and it's a breeze to empty. Even though it's not for wet spills, and it's loud enough to warrant hearing protection, I still find it indispensable.

The vacuum costs \$100 to \$115, without battery. If you have other 18-volt Milwaukee tools, you can use those batteries. A kit including a battery and charger is \$180.

SMART BUY

The last hose you'll ever need

When a company makes a rubber tire with an 80,000-mile warranty, you gotta believe it can crank out a darn good hose, too. Goodyear seems to have done just that. The MAXLite hose has big fittings that make it easy to secure to faucets or other hoses. Goodyear claims it's twice as strong as and 40 percent lighter than standard hoses. And—though I rarely water my yard in winter—the company claims the hose will remain flexible down to 40 below. And it's backed by a limited lifetime warranty—a vote of confidence from the maker.

A 50-ft. MAXLite rubber hose costs about \$35 at home centers, hardware stores and online.



PROBLEM SOLVER

WALL REPAIR THAT WORKS

If you have wall texture that needs repair, check out Zinsser's four aerosol textures: "light" and "heavy" knockdown textures and "fine" and "medium" orange peel. Each type costs less than \$10 per can, and covers 30 to 110 sq. ft. (Homax Products also makes knockdown texture sprays, but we haven't tried them yet.)

Testing is everything with this stuff—set up a half sheet of dry-wall or a piece of cardboard and experiment with the spraying distance to get the best match with your wall.

The spray has a strong odor, so only use it when you can open the windows and vacate the room for a while. It's incredibly messy—use lots of painter's plastic on surrounding floors and ceilings. And be sure to shake the can every few seconds of spraying or the nozzle will plug.

To locate a retailer near you, visit rustoleum.com.



NEW IDEA

Handy way to grab a handle

Getting a hammer out of a standard tool belt loop takes three mini moves: Grab the head, flick it upward and (hopefully) catch the handle—then start swinging. I've done this so many times that I don't think twice about it. That's why, when I saw the Prazi QuickDraw holster, I didn't immediately see an advantage.

Then I started fiddling with it—and grew to like it. It'll never replace my tool belt, but it has a lot of other great uses. You can hang it off your belt or a pocket. When I was working on my knees, it made grabbing and putting away a hammer way easier. For ladder work, it provided a surefire way to pack my hammer. I also liked it for holding a staple gun to install insulation and tar paper. The angle of the holster and the pressure of the metal clamp can be adjusted easily to hold different tools, and it only takes a minute to convert it for left-hand use. Get more info at praziusa.com. Price: about \$10.

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STUFF WE LOVE



GOING MOBILE

A wheely cool idea

DIYers and NFL linebackers have one thing in common (hint—it's not the salary): bad knees. We spend time on our knees laying tile, wood flooring and patio pavers. We kneel to install electrical outlets and base-board molding. We stoop to paint floors and doors. And after a while, all that takes a toll.

That's why I jumped at the opportunity to try KneeBlades, essentially a pair of three-wheeled knee pads. They allow you to glide across hard surfaces while working, meaning way less standing up, walking over, then kneeling down

again to cut, install or fetch. I tried them while installing laminate flooring and loved being able to scoot over to the miter saw to make cuts, then scoot back again to install a section. Better yet, with the click of a button, you can ditch the three-wheeled platforms and use just the high-quality kneepads.



Sure, they're a little heavy and awkward to have on when you DO need to walk around. And someone may tell you that you look like something out of a Transformers movie. But if you're serious about protecting your knees, pick up a pair for \$60 at milescraft.com.



SAFETY SMARTS

BETTER TABLE SAW GUARD

Ibought a table saw and hated the blade guard that came with it. It was big and clunky, offered poor visibility and had no port to connect a dust collection hose. So I ordered this custom guard from Shark Guard. For about \$200, I got a blade guard that fits my saw perfectly, offers good visibility, is less in the way and has a dust collection port that works amazingly well with my dust collector.

The company manufactures blade guards for just about any make and model of saw—even really old ones. The quality is excellent, but expect to wait at least a couple months for delivery, as each one is made to order. The guards are available at thesharkguard.com.

JASON WHITE, CONTRIBUTING EDITOR

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RAMON CHAVEZ



Handy rag cutter

I cut up old T-shirts and towels to use as rags in my shop. To speed up the process, I clamp a utility knife in my bench vise and make a cut to help me tear the scraps. If you're careful, you can make the entire cut with the knife.

ISAAC RICHARDSON



Easy I.D. for switched outlets

I can never remember which of the outlets on my duplex receptacles are powered by the light switch and which one is always live, so I always wind up plugging into the wrong one. To eliminate the confusion, I marked the switched outlet with an "S." No more mix-ups.

NORMAN SCHOCK



EARPLUG TETHER

My earplugs were never around when I needed them, and too often I'd go without rather than search. I started tethering my earplugs to my cap, so there's no longer an excuse for skipping the hearing protection.

RICK WISZ



SQUIRT-GUN TOILET DRAINER

When you're repairing or replacing a toilet, you need to remove all the water. Simply shutting off the water supply and flushing won't do it. A sponge works, but it's kind of slow. So I use an old squirt gun to suck the water out and squirt it into a bucket, leaving just the last few drops to sponge out.

DALE CONKLIN

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Easy concrete mixing

I needed to pour a concrete pad for a brick mailbox I was building. My neighbor, a retired mason, offered to help, and his first instruction was to skip the concrete mixer rental. He had an easier way, using two people, a 6 x 6-ft. heavy-duty tarp with rope handles at each corner, and a water bucket.

Here's how it works. Pour a bag of concrete mix in the center of the tarp, make a crater in the center and then add the recommended amount of water. Each person grabs two tarp corners like they're going to fold the tarp. Lift one corner at a time going in one direction, like you're doing "the wave" at a football game, and continue for a minute or two until the bag is mixed. Pour the concrete right from the tarp into the form and start a new bag. My project, requiring eight bags of concrete mix, was mixed and poured in less than an hour, including washing the tools and tarp.

TRAVIS DUNFORD



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✓Yes



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Trash-can amplifier

I use my Bluetooth speaker all the time, indoors and out. When I was working outside one day, it started to rain. Not wanting my speaker to get wet, I set a plastic trash can on its side and stuck the speaker inside. It not only kept my speaker dry but also amplified and directed the sound, which I'm sure my neighbors appreciated!

BRAD HOLDEN



WRAP TEFLON TAPE IN TIGHT PLACES

Sometimes there's just not enough room to roll Teflon tape around a threaded fitting in a wall cavity, under sinks or along the ceiling. So I apply several wraps of tape around a pencil and tear it from the roll. Then I position the pencil next to the fitting and start the wind. I hold the starting edge with my fingers and rotate the pencil so it unrolls the tape through the narrow clearance on the other side of the fitting. This technique allows me to keep the tape taut so it applies smoothly.

KEN REWINKEL

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DIY Essentials

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

Getting started in welding

Whether you'd like to build custom cars or just fix a cracked lawn mower deck, learning to weld gives your DIY game a serious boost. To help you choose a machine that meets your needs, we'll outline the three basic welding systems. Ideally, you'll pick one that can handle both your first effort and more advanced projects as your skills grow.



MEET THE EXPERT:

Jordan Dickinson is a professional welder and the owner/operator of Union Speed & Style, a custom auto, motorcycle and fabrication shop in Monticello, MN.

Welding basics

All of these welding systems work essentially the same: An electric arc generates enough heat between the electrode (stick or wire) and the metal being joined to melt both together and create the bond.

To ensure a strong bond, the super-hot area around the weld is surrounded by a cloud of inert gas to prevent oxygen and contaminants in the air from weakening the weld. That gas is provided either by the flux inside or around the electrode, or by a bottle of gas that feeds the joint as you weld.

Choosing your first welder

To get started, you'll likely spend \$200 to \$400 for a quality welding machine. Check online to see the range of what's available because most home centers carry only one or two models. A 120-volt welder, powered by a conventional outlet, can weld metal up to 5/16 in. thick. You'll need at least a 20-amp (preferably a 30-amp) circuit.

The higher your machine's amp output, the thicker the material it can weld. Most people work with angle iron and tube steel no thicker than 1/4 in. Any 120-volt machine will suffice for this.

If you're really serious about welding and want more flexibility for future projects, get a 240-volt machine powered by a 50-amp circuit. A 240-volt machine makes welding thick material much easier and faster. Most welding machines have a chart inside a flip-up hood detailing the exact setup you'll need (amps, electrode size, etc.) for a given thickness of material. You can buy a single machine capable of MIG, TIG and stick, but it'll cost about \$1,200.

Besides the welding machine, set aside about \$200 for basic accessories.

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A MIG welder is the most user-friendly type of welder. If you're looking for a general welding system that's easy to learn and good for most welding needs, this is it. MIG welders have an automatic wire feed system.

COST

■ \$250 and up.

PROS

- Welds steel, aluminum and stainless.
- Can weld materials as thin as 26 gauge.
- Good for materials up to 5/16 in. thick.
- Relatively easy to learn.
- Nice-looking welds (with practice).
- Fast to lay down a finished weld.
- Doesn't produce lots of spatter.
- Little need to clean up the bead after welding.

CONS

- Materials must be very clean.
- The wire feed mechanism on cheap machines can be troublesome.

FLUX-CORE SETUP

A MIG machine can also run flux-core wire. Flux inside the wire creates the protective gas shield, so you don't need bottled gas. Flux core works well outdoors, where bottled gas can blow away. It's the fastest and deepest penetrating process, perfect for production and thick material. Dual-shield flux-core wire, used mainly for very thick material, does require bottled gas.



Buy quality. The wire feed mechanisms on a cheap MIG welder will frustrate you forever.

MIG Setup A MIG machine has an automatic wire feed with a bottle of inert gas to shield the weld. With MIG welding, the wire is the electrode as well as the filler material.

BOTTLED GAS

For a MIG setup, you'll need a bottle of gas, typically CO₂ or a CO₂/argon mix. Straight CO₂ is the cheapest option. Adding argon creates a better-looking weld. A filled tank costs \$80 to \$160 depending on the tank size and the gas mixture.

WELDING GUN

The wire feed, electrical arc—created by the electrode/filler wire—and shielding gas are activated by pressing the trigger.

WIRE FEED MIG WELDER

The wire spool is inside the machine or in a separate wire feed box. This feeds the wire through the gun when the trigger is pressed.

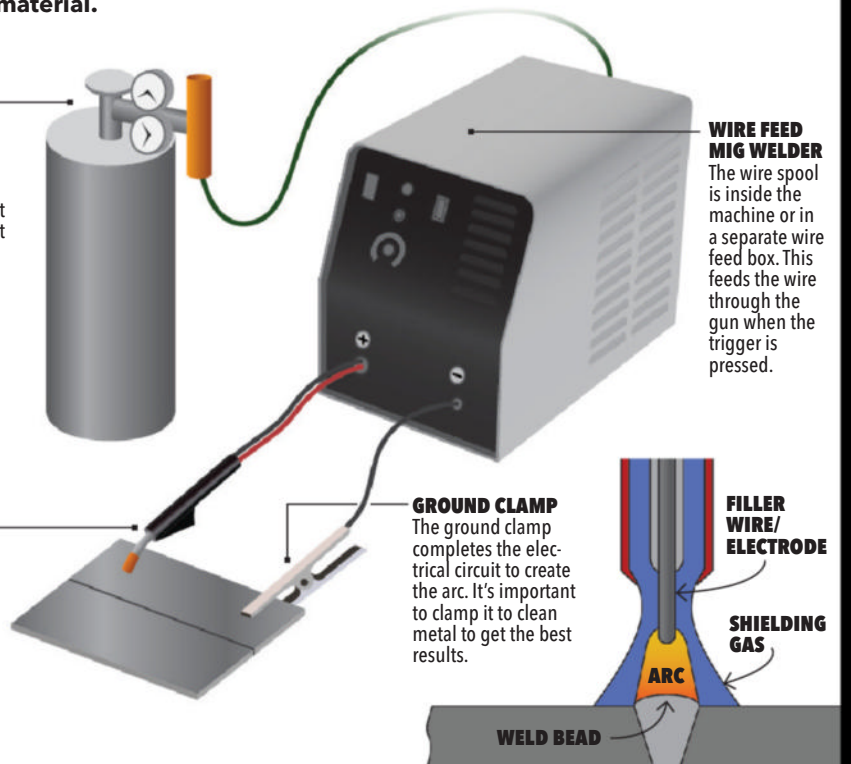
GROUND CLAMP

The ground clamp completes the electrical circuit to create the arc. It's important to clamp it to clean metal to get the best results.

FILLER WIRE/ELECTRODE

SHIELDING GAS

WELD BEAD



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Bobby S.

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TIG Welding

WHOM IT'S FOR: If you want to do projects that require attractive finished welds, such as sculpture or motorcycle exhaust systems, TIG welding is for you.

TIG welding takes lots of practice, as it requires both hands as well as one foot. Compared with MIG or stick welding, it's a bit like going from driving an automatic to driving a stick shift. TIG welding is well suited for auto bodies, chassis/frame, aluminum oil pans, stainless exhaust, metal art, sheet metal, piping systems, motorcycles and bikes.

COST

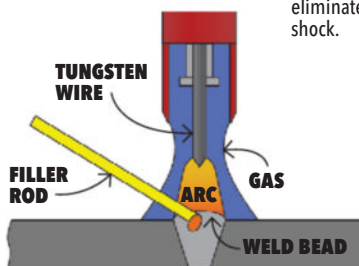
■ \$250 and up.

PROS

- Capable of greater precision than the other processes.
- Strong, high-quality welds.
- Nice-looking weld beads.
- Welds a large range of alloys.

CONS

- Parts must be very clean.
- High-quality machines are expensive.
- Requires lots of practice to become proficient.
- Much slower than MIG.



If you haven't welded in a while, practice on scraps before welding actual parts.

TIG Setup With a TIG setup, the electrode is a tungsten wire. The electrode is not the filler material, as it is with the other processes. The filler is typically a long handheld rod instead of a wire feed spool, and you control the amperage using a foot pedal.

BOTTLED GAS

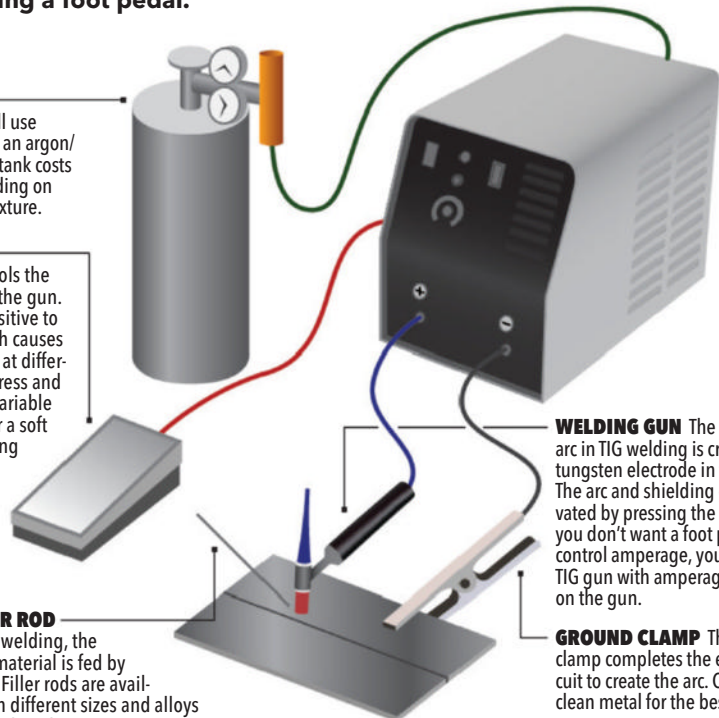
For a TIG setup, you'll use either pure argon or an argon/helium mix. A filled tank costs \$80 to \$200 depending on the tank size and mixture.

FOOT PEDAL

The foot pedal controls the amperage going to the gun. Some alloys are sensitive to thermal shock, which causes materials to expand at different rates, causing stress and even cracking. The variable amperage allows for a soft start and stop, helping eliminate thermal shock.

FILLER ROD

In TIG welding, the filler material is fed by hand. Filler rods are available in different sizes and alloys to suit the job.



WELDING GUN The electrical arc in TIG welding is created by a tungsten electrode in the gun. The arc and shielding gas are activated by pressing the trigger. If you don't want a foot pedal to control amperage, you can get a TIG gun with amperage control on the gun.

GROUND CLAMP The ground clamp completes the electrical circuit to create the arc. Clamp it to clean metal for the best results.

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• Powerful 15 amp motor
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Stick Welding

WHOM IT'S FOR: If you mostly want to do down-and-dirty welding where appearance isn't an issue, stick welding is for you. It's a simple, cheap way to repair dirty or rusty trailers and equipment (especially outdoors).

COST

■ \$100 to \$1,000.

PROS

- Economical.
- Best for welds that don't need to look nice.
- Works well on dirty and rusty parts.
- No bottled gas required.

CONS

- Best used outdoors—there's lots of splatter and smoke.
- Can't be used on metals thinner than 18 gauge.
- A bit difficult to learn, and it does require some practice.
- Slag must be removed after welding using a chipping hammer followed by wire brushing, because slag absorbs moisture and won't accept paint.



You won't be laying down perfect beads right off the bat, but you can get strong, serviceable welds with a few hours of practice.

Stick Setup The flux on the outside of the electrode/filler rod provides the shielding gas, so no bottle is required. This is the machine you want for ultimate portability, as a stick welder is often integrated into a generator and works well outdoors.

FILLER ROD

With stick welding, the filler rod is also the electrode. It's coated with flux, which creates the shielding gas, so no bottled gas is required.

ELECTRODE CLAMP

This clamp holds the electrode/filler rod.

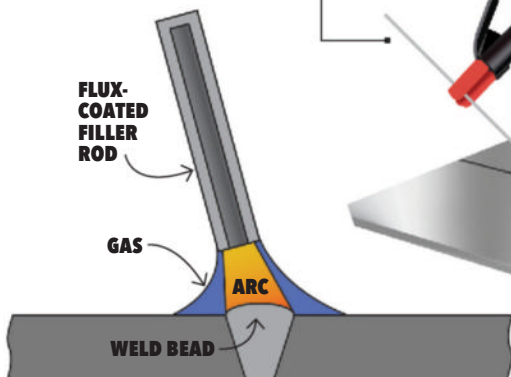


WELDING MACHINE

A stick-welding machine offers ultimate portability. No bottled gas is required, and the machine is often integrated into a gasoline generator.

GROUND CLAMP

The ground clamp completes the electrical circuit to create the arc. Clamp it to clean metal for the best results.



Welding tools & gear

You don't need all of this to get started. Get the basic safety gear first, and the rest as you need it.



1. Auto-darkening helmet (\$40 to \$100). These helmets let you see normally through the face shield until the gun sparks. As soon as the spark is detected, the face shield darkens to protect your eyes.

2. Welding jacket (\$20 to \$80). Made from thick leather, a jacket prevents sparks and molten metal from burning your clothes or skin.

3. Square. This tool lets you make square and angled lines on steel.

4. Chipping hammer. You'll use this to remove slag from the weld bead after stick welding.

5. Sheet metal gauge. You have to know the thickness of your material. This is the perfect quick reference.

6. Metal file. You'll need a few files for shaping parts that you can't get at with an angle grinder.

7. Framing jig (\$50). A framing jig is indispensable for holding parts at a 90-degree angle for tack welding.

8. Welding magnets (\$10 to \$50). Welding magnets are used to hold parts together at precise angles while they're being tack-welded.

9. Safety glasses. Eye protection is a must for all power tool use, but it's especially critical anytime metal particles are likely to go airborne.

10. MIG pliers (\$30). A welder's multi-tool, it's used for nozzle and tip installation, wire cutting, nozzle cleaning and slag removal.

11. Soapstone. Used to mark metal for cutting and welding, soapstone remains visible under extreme heat and has low electrical conductivity.

12. Deburbing tool. This is used to remove the wire edge left on a piece of steel after it's been cut.

13. Angle grinder (\$30 to \$100). You'll use an angle grinder to shape parts before welding, and to grind and refine the bead after welding.

14. Metal brush. This is the go-to tool to clean parts before welding.

15. Apron (\$40). An apron protects your clothes for non-welding tasks, such as grinding or cutting.

16. Welding gloves. These thick leather gloves with a long cuff protect your hands and forearms from sparks and molten metal.

17. Welding clamps and C-clamps. Welders use all kinds of clamps to hold materials in place for tack welding. You can't have too many.



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.com/us/en/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 Gary Wentz

PLASTER & LATH TEAR-OFF

Do it faster,
safer and better



Removing plaster and lath is always an ugly ordeal, but my first try, 25 years ago, was the worst. I made every mistake in the book—mistakes that cost me time, frustration and blood. Since then, I've gotten smarter. Here's what I've learned.



Turn off the power!

Old walls hold hazardous surprises like wires without insulation and devices without junction boxes. In one wall I tore out, the wiring was embedded in the plaster! So turn off the circuits inside the wall and check any outlets or switches with a noncontact voltage tester before starting the tear-out.



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Step 1



A unique tool that creates the proper sub floor slope needed underneath the pan liner to manipulate the water towards the weep holes that are an integral part of shower floor drains.



Step 2



A stay-in plastic form designed to eliminate the possibility of any nails puncturing the liner on the top or inside walls of shower curbs.



Step 3



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Tools used:

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- 2) Kirb-Perfect®
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- 4) Universal Center Ring

Handi-Kirb with Roll on and Sheet Membranes



Tools used:

- 1) Pre-Pitch™
- 2) Handi-Kirb
- 3) Quick-Pitch®

Low Profile curb

- 1) Pre-Pitch™
- 2) Handi-Kirb

Sheet Membranes



Tools used:

- 1) Quick-Pitch®
- 2) Quick-Clips
- 3) Kirb-Perfect®

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BEST PRO TIPS

Prepare for a dust storm

Demolishing plaster and lath is a dusty, filthy job. Wear a dust mask, cover doorways with painter's plastic, turn off the furnace or central air conditioning, and cover HVAC grates.



MEET THE EXPERT:

Gary Wentz is a carpenter and the editor-in-chief of *The Family Handyman*. He claims to have torn out more than 2 acres of plaster and lath.



Diamond Blade

Grinder

Cut the lath

After cutting the perimeter of the plaster, cut the wood lath to prevent cracking the adjoining walls and ceilings. An oscillating tool with a round blade is perfect for this.



Oscillating Tool

Round Blade

Cut the plaster

As you break up plaster, cracks can spread to adjoining walls and ceilings. To prevent that, cut the plaster where you want the demolition to stop. I make perimeter cuts with a grinder and a diamond blade. A diamond blade can also cut through metal lath, which was sometimes added over wood lath at corners and archways.

Cutting with a grinder whips up tons of dust. You can also use an oscillating tool equipped with a diamond or carbide-grit blade, which will cut slower but with less mess.

Protect floors

Lath nails and plaster chunks really tear up flooring. The best protection is 1/8-in. hardboard taped together at seams. With wood floors, I use hardboard even if I plan to refinish the floor later. Lath nails can leave deep gouges that are hard to sand out.

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Pre-cut plugs are 10x bigger!

OR... Plant Your Way With **FREESTYLE PLUGS!**



Cut any size plugs from sheets!

THE ONE TIME, LIFETIME LAWN SOLUTION!



SAVE OVER 50%

NEW PRE-CUT SUPER PLUGS now available!

Stays lush and green in summer

Mow your Zoysia lawn once a month – or less! It rewards you with weed-free beauty all summer long.

7 Ways Our Amazoy™ Zoysia Lawn Saves You Time, Work and Money!

1 CUTS WATER BILLS AND MOWING BY AS MUCH AS 2/3

Would you believe a lawn could look perfect when watered just once? In Iowa, the state's biggest Men's Garden club picked a Zoysia lawn as "top lawn – nearly perfect." Yet, this lawn had been watered only once all summer to August!

In PA, Mrs. M.R. Mitter wrote, "I've never watered it, only when I put the plugs in...Last summer we had it mowed 2 times...When everybody's lawns here are brown from drought, ours stays as green as ever." *That's how Amazoy Zoysia lawns cut water bills and mowing! Now read on!*

2 NO NEED TO DIG UP OLD GRASS

Plant Amazoy *your way* in an old lawn or new ground. Set plugs into holes in the soil checkerboard style. Plugs spread to create a lush, thick lawn, driving out weeds and unwanted growth. Easy instructions included with every order.

3 ENVIRONMENTALLY FRIENDLY

No weeding means no costly chemicals. Since Amazoy Zoysia lawns naturally resist insects, you'll save money, while helping to protect the environment. You'll never have to expose your family and pets to the risk of weed killers and pesticide poisons.

4 FOR SLOPES, PLAY AREAS, BARE SPOTS AND PARTIAL SHADE

You can't beat Amazoy Zoysia as the low-cost answer for hard-to-cover spots, play-worn areas, places that have partial shade and erosion on slopes.

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

5 IT STAYS GREEN IN SPITE OF HEAT AND DROUGHT

"The hotter it gets, the better it grows!" Plug-in Zoysia thrives in blistering heat, yet it won't winter-kill to 30° below zero. It just goes off its green color after killing frosts, and begins regaining its green color as temperatures in the spring are consistently warm.



Thrives from partial shade to full sun.



Plant it from plugs.

6 CHOKES OUT CRABGRASS AND WEEDS ALL SUMMER

Your established Amazoy Zoysia lawn grows so thick, it simply stops crabgrass and most summer weeds from germinating!

7 NOW 3 WAYS TO START YOUR AMAZOY ZOYSIA LAWN!

1) **Freestyle plugs** come in uncut sheets containing a maximum of 150 - 1" plugs that can be planted up to 1 ft. apart. Freestyle plugs allow you to make each plug bigger and plant further apart – less cutting and planting – you decide.

2) **New Super Plugs** come precut into individual 3"x3" plugs ready-to-plant (minimum 1 per 4 sq. ft.). They arrive in easy to handle trays of 15 Super Plugs. Save more time and get your new lawn even faster!

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/mag or by phone at 410-756-2311.

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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.

Max Plugs*	Free Plugs	Grass Sheets*	Your PRICE	+ Shipping	SAVINGS
150	—	1	\$15.95	\$8.50	—
500	100	4	\$50.00	\$15.00	33%
750	150	6	\$66.00	\$19.00	41%
1100	400	10	\$95.00	\$30.00	48%
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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.

Super Plugs	Free Plugs	Trays	Your PRICE	+ Shipping	SAVINGS
15	—	1	\$24.95	\$8.50	—
60	15	5	\$90.00	\$20.00	34%
95	25	8	\$110.00	\$30.00	47%
120	30	10	\$125.00	\$35.00	50%
180	45	15	\$180.00	\$50.00	54%

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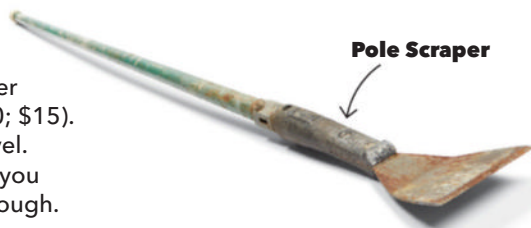
We ship all orders the same day the plugs are packed and at the earliest planting time in your state.

BEST PRO TIPS



Scrape off the plaster

Chip away a small starter hole with your hammer claw. Then get to scraping. My tool of choice is a bent pole scraper that screws onto a broom handle (mine is a Hyde No. 12070; \$15). Some home wreckers prefer an ice scraper or a square shovel. Whatever you use, scrape parallel or diagonal to the lath. If you scrape perpendicular to the lath, your scraper will break through.



Scoop up the plaster

Shovel the plaster into buckets or heavy-duty trash bags. If you choose bags, don't fill them too full; plaster is heavy!



Don't mix plaster and lath

You could tear off plaster and lath at the same time—that's actually a little faster than attacking them separately. But cleaning up a mountain of mixed debris is painfully slow. You can't shovel up the plaster until you fish out all the buried lath, one stick at a time. So tear off the plaster, clean up, and then strip off the lath.

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BEST PRO TIPS

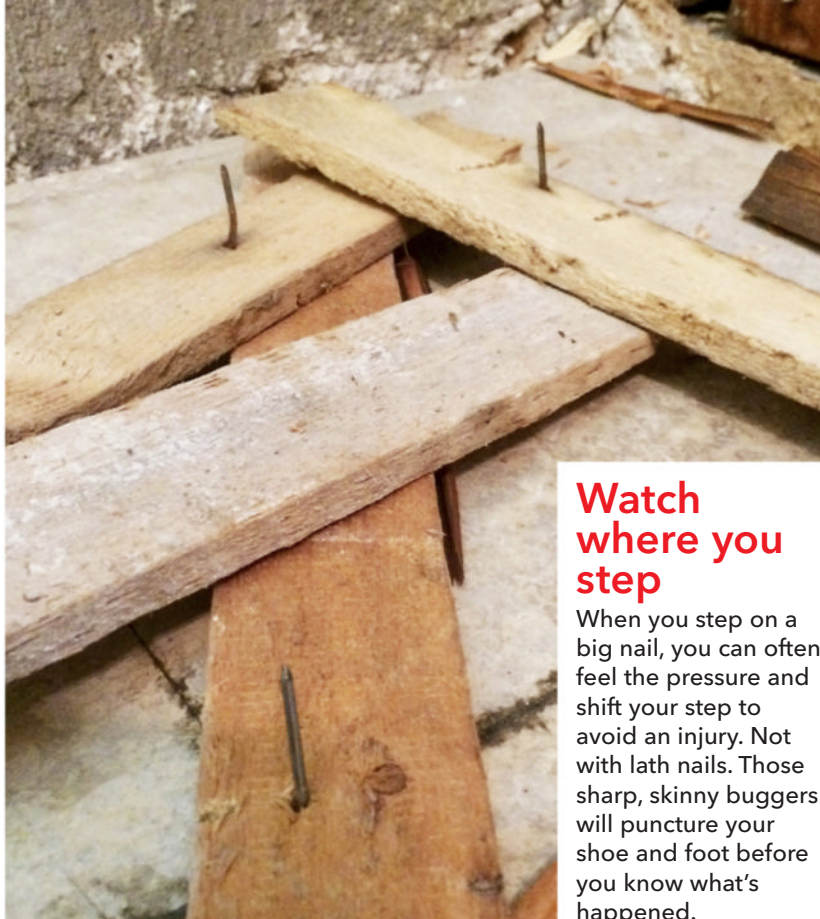


Yank off the lath

Lath nails come out easily, so you can often pull off two or three rows at a time. I like to use the hook of a wrecking bar. Try to remove full lengths of lath; they're easier to pick up and haul out than a million splintered sticks.

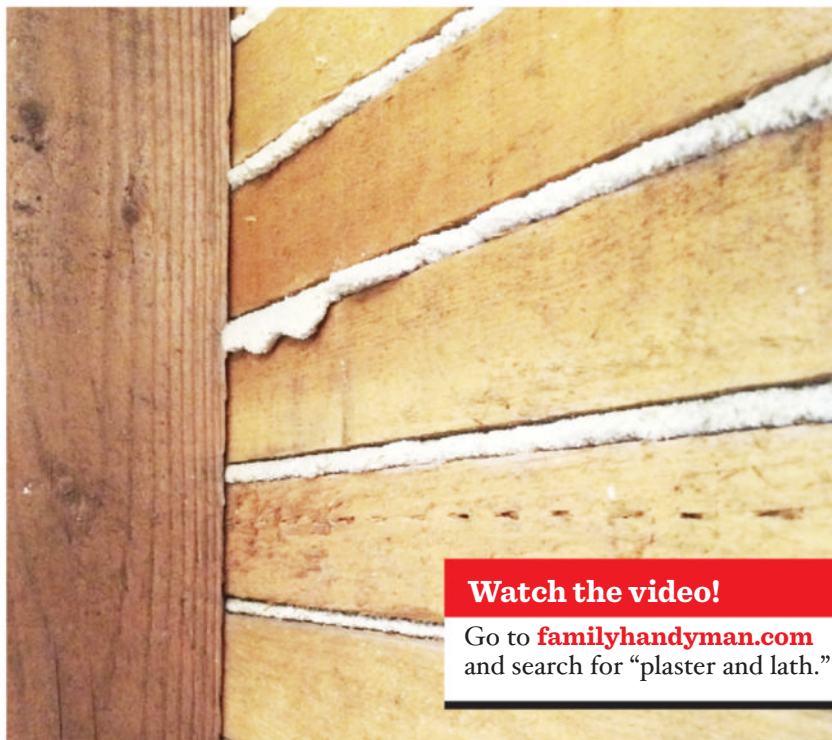
Does plaster contain asbestos?

Adding fiber to plaster, for extra strength and crack resistance, was standard practice for centuries. The wall shown here contained horsehair. But at least one major plaster manufacturer used asbestos instead, and did so from the 1920s until the '70s. So you can't be sure unless you test. Just search online to find a testing service and send in a sample. You'll get the results in about a week and pay about \$60. If the plaster does contain asbestos, check with your local inspector for demolition regulations.



Watch where you step

When you step on a big nail, you can often feel the pressure and shift your step to avoid an injury. Not with lath nails. Those sharp, skinny buggers will puncture your shoe and foot before you know what's happened.



Watch the video!

Go to familyhandyman.com and search for "plaster and lath."

Hit the other side from behind

If you're removing plaster and lath from both sides of a wall, do this: Completely strip one side of the wall, then attack the other side from behind. I like to stab at the lath with a square shovel, right next to studs. As the lath loosens, the plaster breaks away and falls off. After that, the lath is already loosened and pops off with a few more shovel whacks. Karate kicks work too!

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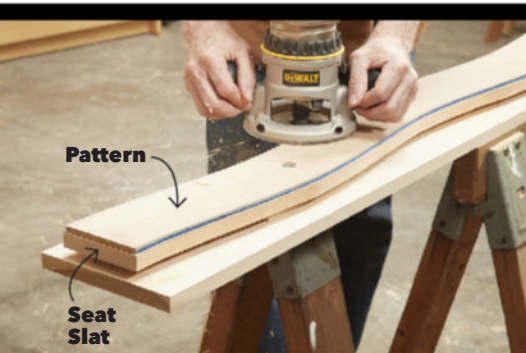
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RETRACTABLE AWNINGS

Wave BENCH

A bold design that makes a splash, indoors or out.

By Tom Caspar

It's a conversation piece with a practical purpose, a woodworking masterpiece you can build in a few afternoons. This bench hits the sweet spot as a project that's both functional and beautiful, and a vehicle for showing off your skills. If you're handy with a drill press, table saw, jigsaw and router, you're ready to build it.



A PATTERN MAKES IT POSSIBLE

Curves are always a woodworking challenge, and this bench is as curvy as projects get. But if you carefully craft a pattern, you can turn out perfect, identical seat slats. The pattern will guide your pen when you mark the slats, and your router when you shape them.



Pattern Bit





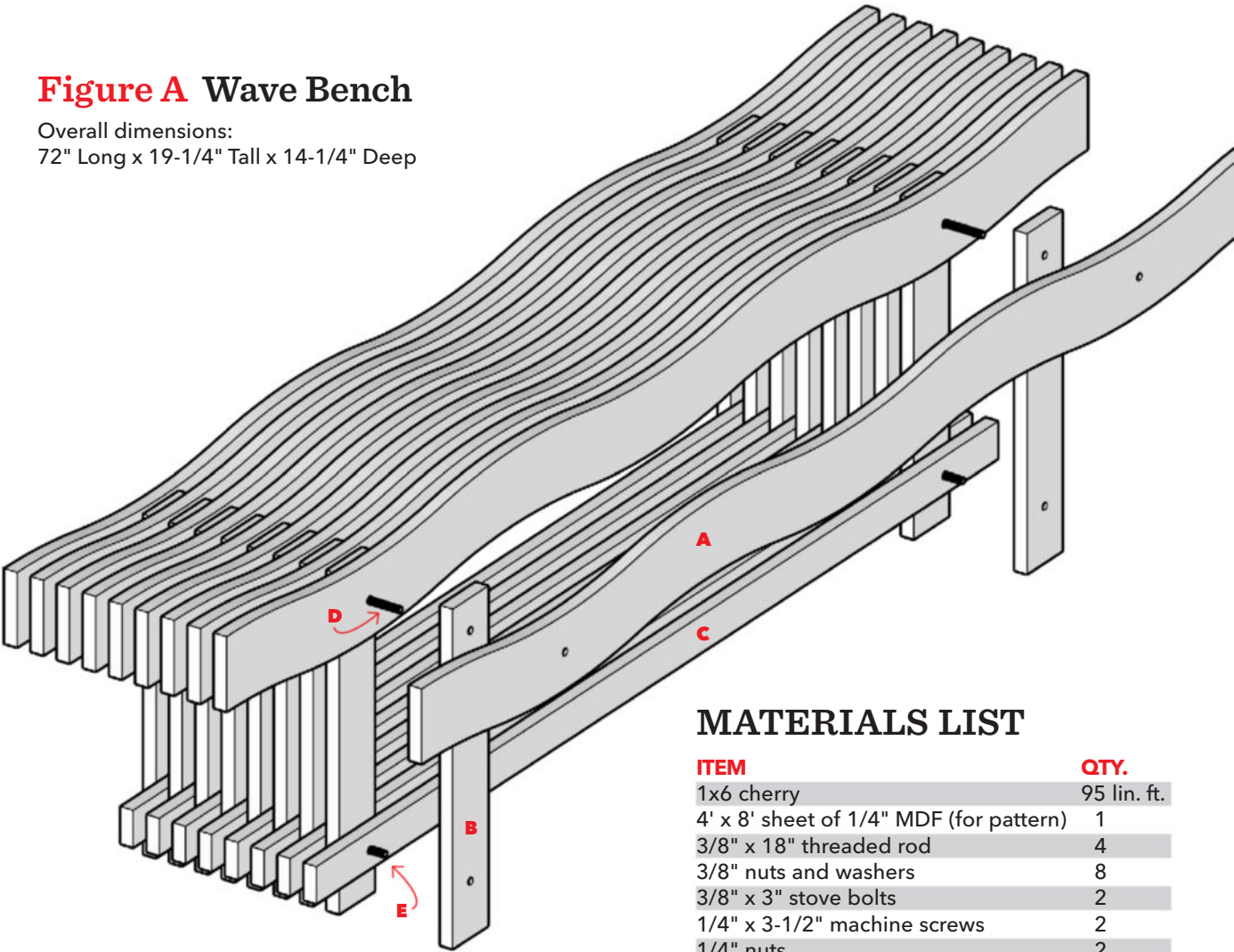
WHAT IT TAKES

TIME	COST	SKILL LEVEL
2 weekends	\$500	Intermediate

TOOLS Standard wood shop tools, including a drill press

Figure A Wave Bench

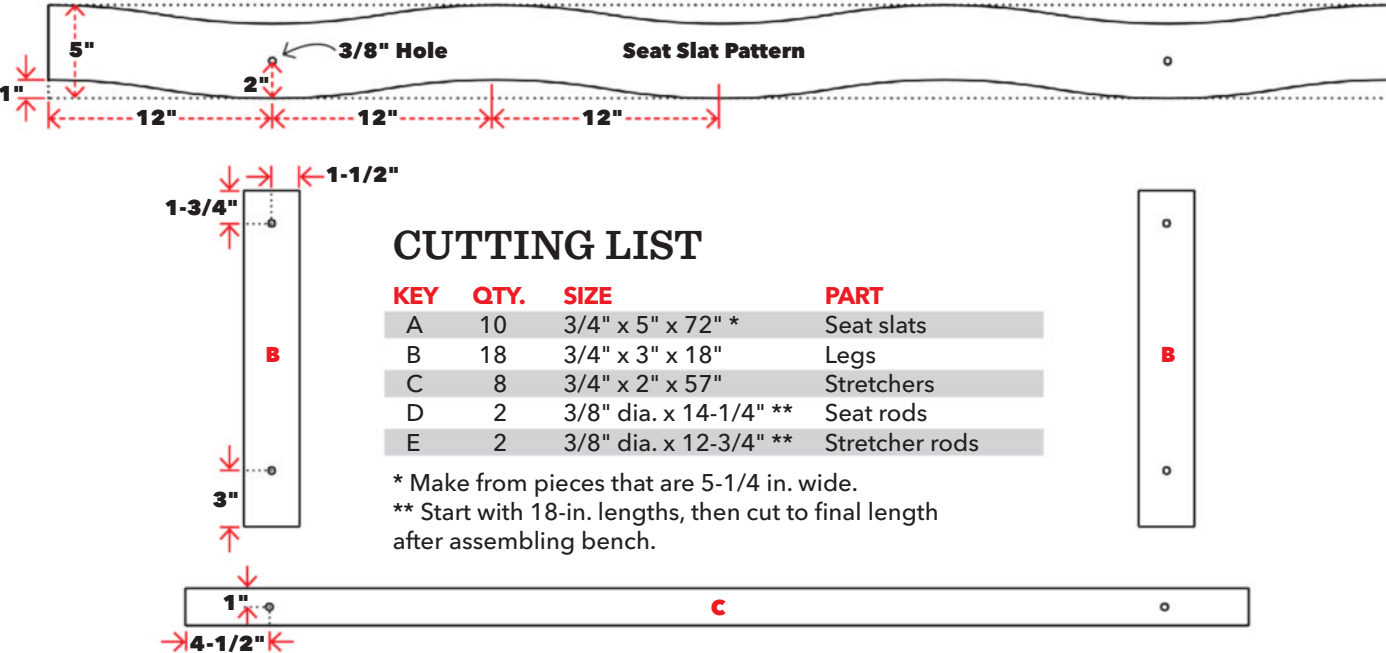
Overall dimensions:
72" Long x 19-1/4" Tall x 14-1/4" Deep



MATERIALS LIST

ITEM	QTY.
1x6 cherry	95 lin. ft.
4' x 8' sheet of 1/4" MDF (for pattern)	1
3/8" x 18" threaded rod	4
3/8" nuts and washers	8
3/8" x 3" stove bolts	2
1/4" x 3-1/2" machine screws	2
1/4" nuts	2
Exterior wood glue, metal yardstick, 3/8" brad-point bit, pattern router bit, finishing supplies, 3/4" countersink bit	

Figure B Wave Bench Parts



CUTTING LIST

KEY	QTY.	SIZE	PART
A	10	3/4" x 5" x 72" *	Seat slats
B	18	3/4" x 3" x 18"	Legs
C	8	3/4" x 2" x 57"	Stretchers
D	2	3/8" dia. x 14-1/4" **	Seat rods
E	2	3/8" dia. x 12-3/4" **	Stretcher rods

* Make from pieces that are 5-1/4 in. wide.

** Start with 18-in. lengths, then cut to final length after assembling bench.

What you'll need

I made this bench from cherry, a wood that's as resistant to rot as cedar or redwood. Hardwood lumber prices vary widely, so your cost could be much higher. Whatever wood species you choose, beware of knots. Knots near the center of a board aren't a problem, but knots near edges may disrupt the wave pattern.

I recommend using a drill press to make the holes for the threaded rods that align all the parts. These holes must be plumb for everything to fit without any play. If you don't have a drill press, make the holes 1/16 in. oversize and nudge the pieces into alignment when you glue them. You'll also need an extra-large (3/4-in.) countersink bit.

To make all the waves exactly the same shape, you'll need a jigsaw and a router with a 1/2-in. collet and variable speed. For the best results, use a large-diameter top-bearing pattern bit. I used a Whiteside No. 3016 bit (\$45), which has a 1-1/8-in. cutting diameter.

Start with a pattern

Make a pattern for the seat slats (A) from 1/4-in.-thick material. I used MDF, which is ideal for shaping with sandpaper. Cut the pattern 5 in. wide by 72 in. long.

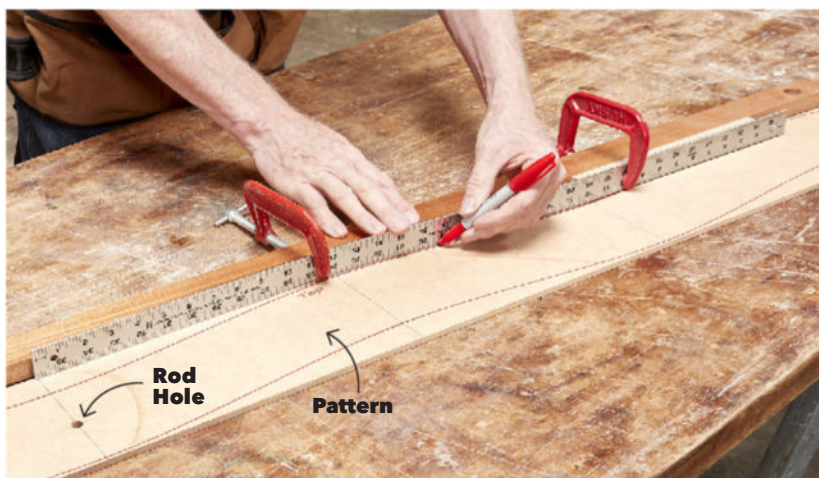
Lay out the wave design on the pattern (**Figure B**). It's not hard. By bending an aluminum yardstick, you can easily make the perfect S-shape curve that forms each half of a wave (**Photo 1**). First, draw vertical lines 12 in. apart to mark the lengths of the waves. Next, draw marks on each line that are 1 in. from the top and 1 in. from the bottom of the pattern. These marks indicate the crest and trough of each wave.

Make the curve by clamping the yardstick to a stiff board. Place a 1-in. spacer block at the 24-in. mark



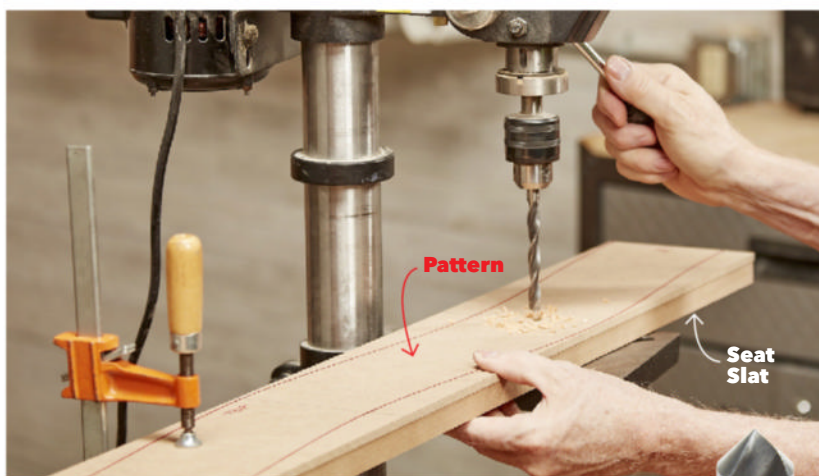
1. BEND A YARDSTICK

Make a perfect curve for the seat of the bench by clamping a metal yardstick and block to a stiff board.



2. DRAW THE WAVES

Mark out a pattern by tracing the bent yardstick on a piece of 1/4-in. material. Drill two rod holes in the pattern as well.



3. DRILL A GUIDE BOARD

Before cutting the waves in the pattern, clamp it to one of the seat slats. Drill rod holes through this slat, then use it as a guide to drill the other slats. Next, use a countersink bit to countersink the holes in the pattern from one side. Countersink both sides of the holes in the slats.



Countersink Bit

MEET THE EXPERT: Tom Caspar is a professional furniture maker and the former editor of *American Woodworker* magazine.





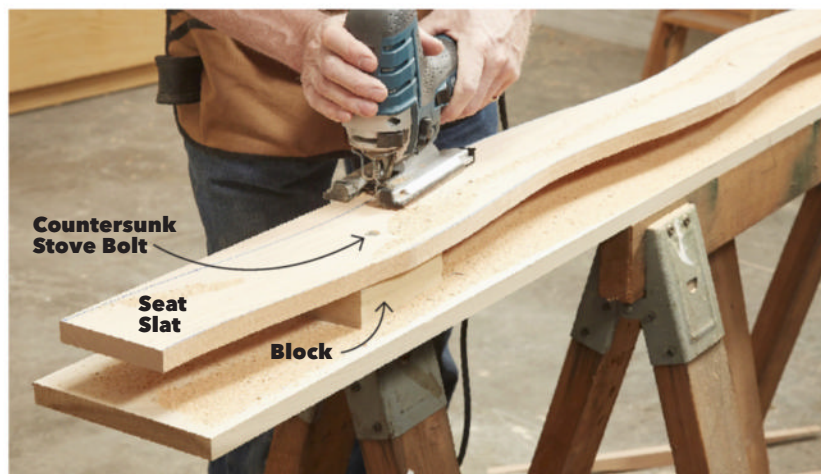
4. SHAPE THE PATTERN

Cut the pattern along the outside edge of the lines, then sand to the inside edge. Trace the pattern onto each seat slat.



5. BUILD A CUTTING PLATFORM

Fasten a 6-ft. board to a pair of sawhorses to make a sturdy platform for sawing and routing the seat slats.



6. SAW THE WAVES

Fasten the seat slats to the platform using bolts and the rod holes you drilled in each slat. Saw along the outside edge of the waves.

and clamp. Tighten a second clamp near the 12-in. mark. This results in a smooth S-curve with a 1-in. rise and a 12-in. run. Use this curve to draw each 12-in. section of the wave design (**Photo 2**). I recommend using a fine-tip Sharpie to make a line that's about 1/8 in. wide.

Draw a large "X" on the right end of the pattern. Write "TOP" at one of the crests of the top wave. These marks are essential for correctly orienting each piece later on.

Lay out the centers of two 3/8-in. holes on the pattern. Drill the holes using a brad-point bit and a drill press. (It's hard to locate a standard twist bit exactly on your mark.) Place a piece of plywood under the pattern to drill into so the bit doesn't chip out the bottom of the pattern.

Make the seat slats from 5-1/4-in.-wide boards. Cut them the same length as the pattern. Mark an "X" and "TOP" on each piece.

Select one slat to use as a guide for drilling all the others. (If you used the pattern as a guide, its holes would become enlarged and inaccurate very quickly.) Center the pattern side-to-side on this slat, then clamp the pattern to it. With the drill press turned off, line up the bit with one hole in the pattern. Drill the hole all the way through (**Photo 3**). Drill the second hole in the same way.

Clamp the guide to each seat slat and drill both holes in each piece. This ensures that the holes will be the same distance apart even if your slats vary slightly in length.

Countersink both sides of each hole. Drill deep enough so that the depression is about 9/16 in. wide. Countersinking the holes now will make the bench much easier to assemble later on.

Next, saw along the pattern's waves using a jigsaw or band saw. Stay on the outside edge of the line. Smooth the curves to the inside edge of the line.

Place the pattern on each seat slat and align the holes using 3/8-in. stove bolts or dowels. Be sure the "X" and "TOP" marks on the pattern are oriented the same way as the marks on each seat piece. Trace around the pattern with a marker. Once more, make a 1/8-in.-wide line.

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Make waves

You'll use a jigsaw to cut each slat slightly oversize, then use a router and a pattern bit to make each piece exactly the same shape. Building a platform makes both jobs easier and safer (**Photo 5**). To make it, screw a 3/4-in. x 8-in. x 72-in. board to sawhorses. Clamp one slat to the platform and used it as a guide to drill two 3/8-in. holes through the platform.

Two blocks elevate the slats above the platform so the saw's blade doesn't hit it. I used blocks that were 1-1/2 in. thick and 3 in. wide. Drill 3/8-in. holes through the blocks and platform.

Fasten each slat to the platform with two flat-head 1/4-in. x 3-1/2-in. machine screws and wing nuts. Saw along the outside edge of the lines (**Photo 6**). Cut both sides of each piece.

Routing comes next. Fasten the template to the workpiece and both parts to the platform using two 3/8-in. x 3-in. stove bolts. Your router will bump into the heads, however, so before you begin routing, countersink the holes in the pattern so the heads will sit slightly below the pattern's surface. You'll also need two 1/2-in.-thick supports with 3/8-in. holes to elevate the workpiece so the router bit won't cut into the platform. Fasten the pattern, workpiece and supports to the platform.

Route each slat (**Photo 7**), moving the router in the correct direction (with the pattern on your left, you push the router forward). Round the edges of each slat with a 1/8-in. round-over bit (**Photo 8**). Smooth the waves with 100-grit sandpaper.

Make legs and stretchers

Cut the legs (B) to width and length. Use a stop on your miter saw or table saw to ensure they're all the same length. Mark one edge of each leg with an "X." Drill two 3/8-in. holes in the middle of each leg (**Photo 9**). Use the "X" mark to orient each leg the same way. Countersink both sides of each

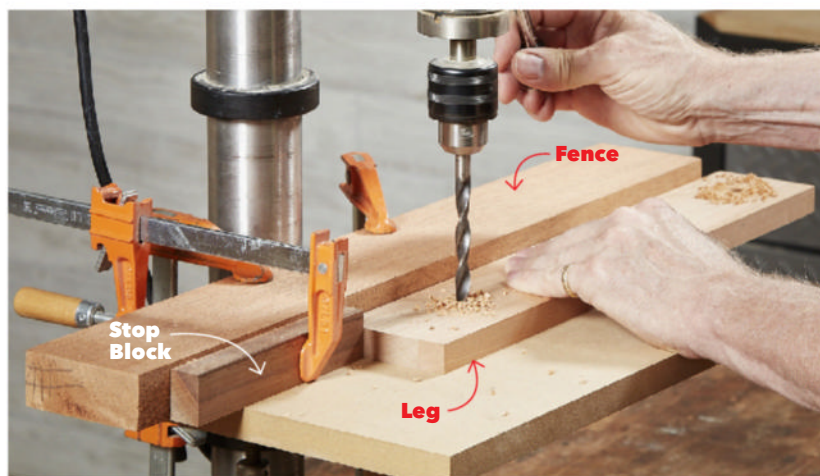
7. ROUT THE WAVES

Fasten the pattern to the seat slat and rout with a pattern bit. The bearing on the bit rolls along the pattern, creating perfectly smooth waves.



8. ROUND THE EDGES

To make the seat comfortable, soften the edges of the slats with a 1/8 in. round-over bit.



9. DRILL THE LEGS

Position each leg against a fence and a stop block to ensure that all the holes are at exactly the same location.

hole as you did with the slats. Round over all the edges and ends of each leg using a router.

Cut the stretchers (C) to width and length. Mark one edge with an "X." Select one stretcher as a guide, then drill 3/8-in. holes in it that are exactly the same distance apart as the holes in the seat template. Use the guide to drill holes in all the other stretchers. Countersink both sides of each hole and round the edges.

Cut four pieces of 3/8-in. rod to make the seat rods (D) and stretcher rods (E). Cut these pieces about 18 in. long for now. After sawing, file the ends of the rods so that a nut will easily thread onto them.

Assemble the bench on its side, adding one part at a time (**Photo 10**). Use the rods to keep parts aligned. Be sure the X's on each part are oriented the same way. If a part doesn't fit, widen one of its holes with a larger bit. After test-fitting, disassemble the bench.

Finish and assemble

It's best to apply finish to the parts of the bench before final assembly (**Photo 11**). You'll glue the parts together after you finish them, using a waterproof glue such as Titebond III. Glue won't stick to a finish, so mark the contact areas and keep them free of finish.

After the finish dries, glue just one set of parts together (one slat, two legs and a stretcher). Be sure the legs are square to the stretcher. Use the 3-in. stove bolts from the template-routing job along with washers and nuts to align the parts and clamp them together. Once this first set is complete, adding more parts and making sure they're square will be much easier.

Remove the stove bolts and use the rods to align and clamp the remaining parts. Center the rods on the set of parts you glued, then add a few parts at a time on both sides (**Photo 12**). Check for square as you go. Before you add the outermost slats and legs, cut the rods so they'll end up flush with these parts. Clamp and glue these parts to the bench. No nuts are needed for these final parts.



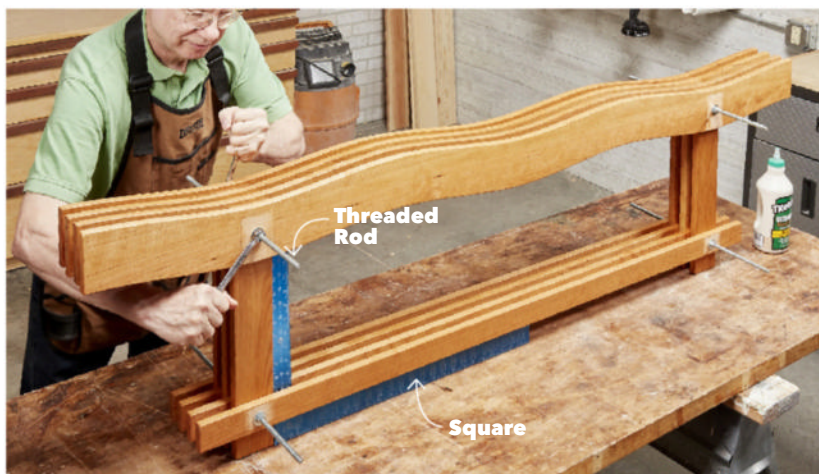
10. TEST THE FIT

Assemble the bench layer by layer to make sure all the parts fit. Keep them aligned with long sections of threaded rod.



11. FINISH THE PARTS

Apply an exterior finish to all the parts. Leave the areas where parts overlap each other unfinished so glue will stick to them.



12. GLUE THE BENCH

Start with just a few parts and make sure they're square. Clamp the parts together with nuts on the threaded rod.



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CHOOSING A LAWN TRACTOR

*Here's the info
you need to
choose the
best model for
your yard
and budget.*

*By Rick
Muscoplat*



Whoops!
Bad Driving!

LAWN TRACTORS come in a wide price range: \$1,200 to \$2,200. Even the lowest-priced models can cut your mowing time in half compared with a walk-behind mower. So how do you choose the best machine for your yard? We talked to experts at the four largest manufacturers to get their take on which features are most important. Then we borrowed and tested four machines that span the price range. Here's what we learned.

Before you buy: 6 questions to answer

1 Is a lawn tractor right for you?

You're a perfect candidate for a lawn tractor if your yard is larger than a half acre and you spend an hour or more cutting grass with a walk-behind mower. If your yard is slightly smaller but you want to reduce mowing time, a riding mower might be a better choice.

2 What size mower deck?

Obviously, the larger the mower deck, the faster you'll finish. But keep in mind that a large mowing deck may not fit through your fence gate or between trees. Measure before you buy. As a general rule, choose a 42-in. deck for 1-acre lots, a 42-in. to 46-in. deck for 1- to 2-acre lots, and a 48-in. deck for larger yards.

3 Where will you park it?

Lawn tractors have a big footprint. You'll need a large storage space—at least 70 in. long by 50 in. wide, with about 48 in. of free space above the unit (for a machine with a 42-in. deck).

Buying a mowing deck that's too small is a mistake tractor owners only make once.

4 Can you haul it?

When your tractor needs routine service or repairs, you can pay a pick-up and delivery fee or haul it yourself—if you have a trailer or a truck and ramps. Lawn tractors weigh about 400 lbs.

5 Will it climb your hills?

Lawn tractor engines are sized to climb the grade listed in the specs. If you have a hilly yard, check those specs.

6 Does the seat fit your seat?

You'll be spending a lot of time on the machine and the ride can be rough, so you'll want a comfortable seat. Manufacturers equip their machines with mid-back or high-back seats that vary in width and comfort. Conduct a butt test before you buy.

If you'll be the only driver, you don't need an adjustable seat. However, if you're splitting mowing duties with others, choose a seat with a lever release to adjust the depth and height.



Rider, lawn tractor, garden tractor: What's the difference?

Some retailers use the terms "lawn tractor," "riding mower" and "garden tractor" interchangeably. But they're not the same.



Rear-engine riding mowers do one thing: cut grass. Compared with lawn tractors, they're less powerful, slower and cut a smaller swath (maximum width: 30 in.). At \$800 to \$1,400, they're not always cheaper than a lawn tractor. The least expensive models are a good choice for smaller yards and limited storage space.



Lawn tractors, the focus of this article, have more power, cutting widths of up to 48 in., comfort features, faster cutting speed and a higher price tag (\$1,200 to \$2,200). They can tow a cart or vacuum attachment, and most models have a detachable mower deck, allowing you to add winter accessories like a snow thrower.



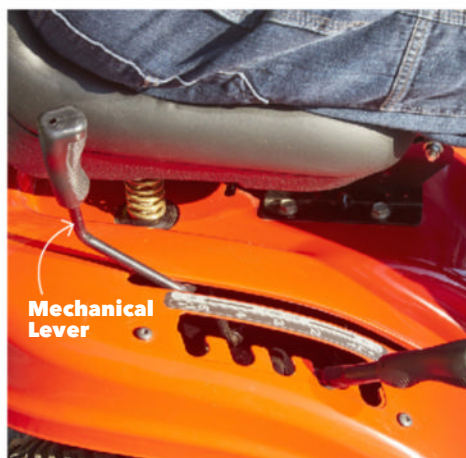
Garden tractors are the heavy-duty models. They start at about \$2,200 and top out at about \$8,000. They accept larger mowing decks (up to 72 in.!) and a wide range of implements such as tillers, seeders, snow throwers, front loaders and backhoes.

Features we like



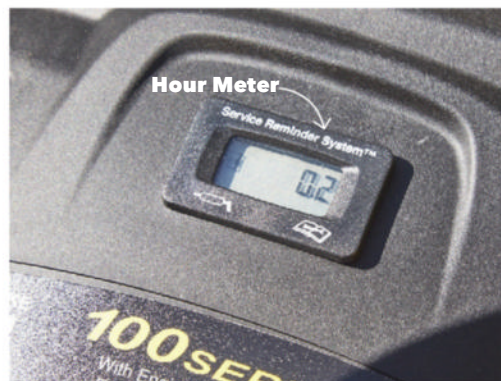
Easy deck engagement

For safety reasons, the cutting blades don't automatically spin at start-up; you have to engage them with a mechanical lever or an easy electric push-button. Some of the lever mechanisms are awkward or stubborn, so try before you buy.



Bumper

Trust us on this: You're going to smack a tree someday, and that impact can destroy the hood. So buy a machine with a bumper or set aside some dough to buy an add-on bumper from the manufacturer.



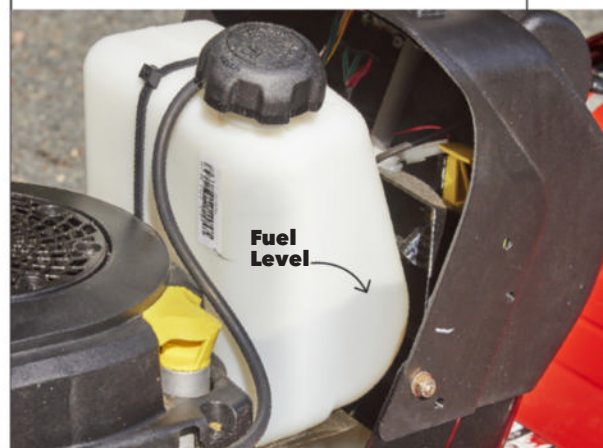
Hour meter

All lawn tractors require maintenance based on hourly usage. A built-in hour meter takes all the guesswork out of maintaining your tractor. You can always add an hour meter later (\$50), but the built-in models eliminate that hassle.



Convenient gas gauge

Some models have a gas gauge you can check while driving, while others offer a see-through tank. The less expensive models require you to stop and lift the hood to check the fuel level.



Other considerations

3 Transmission Types

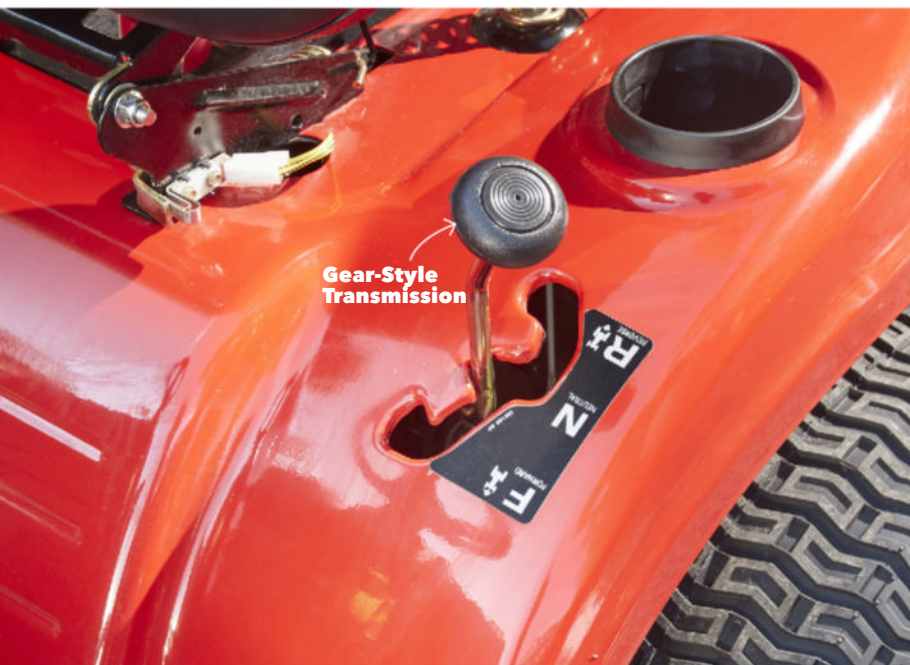
Gear-style transmissions are common on the least expensive lawn tractors. They require you to manually move a lever to change speeds and to

switch from forward to reverse.

Continuously variable transmissions (CVTs) are a step up from geared transmissions and are available in two styles. The less expensive designs have

a foot pedal to vary speed and a manual shift lever to change from forward to reverse. The higher-priced CVT models don't use a shifter. Instead they have forward and reverse pedals. CVT transmissions provide great value and the same top-end speed as a hydrostatic transmission, but they can jerk a bit when you're starting out or maneuvering at slow speeds.

A **hydrostatic transmission** is the best choice but also the costliest. It works like an automatic transmission in a car and provides the smoothest operation, especially when you're maneuvering around gardens and trees at slow speeds.



Engine size and features

Lawn tractor engines are sized to match the mower deck and climb the grade listed in the manufacturer's specs. Buying a machine with a larger engine won't get you a higher top-end speed, but the larger engine is important if you plan to haul a cart or add a snow blade or a snow thrower accessory.

Most tractor engines have traditional carburetors. However, the Cub Cadet model shown on p. 48 has electronic fuel injection (EFI), which dramatically reduces the starting problems associated with carbureted engines and ethanol fuel. Plus, Cub Cadet claims its EFI system boosts fuel efficiency by 25 percent.



Mow-in-reverse mechanisms

Lawn tractors automatically stop blade movement the instant you shift into reverse. To mow in reverse, you have to hold in a button the entire time you're mowing in reverse or turn the key to the reverse position and then reposition the key when you want to move forward. We slightly prefer the button system, but both are inconvenient.

Zero turn radius mowers:

Are they right for you?

Zero turn radius (ZTR) mowers cut grass 40 percent faster than even the fastest lawn or garden tractor. They move faster, and the zero turn radius feature allows them to do a 180-degree turn at the end of the cutting path, totally eliminating the "loop around" needed by rear engine riders and tractors.

A ZTR mower is far more maneuverable than a rear engine rider or tractor, allowing you to closely follow a winding garden edge and cut around trees in a single loop. That eliminates the need to go back and clean up with a string trimmer.

Higher-end ZTR models include a seat suspension system that isolates you from the mower so you don't feel bumps and vibration—an especially important feature if you have bumpy terrain. ZTR mowers with a 42-in. cutting width start at about \$2,300 and top out at about \$5,000 for a 60-in. model.



Easy Year-Round Property Cleanup

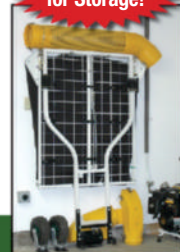


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4 models, 4 prices

We found 21 lawn tractors in the \$1,100 to \$2,200 price range and chose these four models as good representatives of the price



TROY-BILT TB BRONCO \$1,199

This very affordable Troy-Bilt 42-in. lawn tractor (13WX78BS011) cuts and rides like the more expensive models we tested. The 19-hp Kohler engine is powerful enough to handle hills. The CVT transmission worked flawlessly, but you must manually shift from forward to reverse. That's not a problem if you cut long swaths, but if you had to do much maneuvering around trees or at the end of a path, it could get old fast. It's a lot of machine for the price.



CUB CADET XT1-LT42 \$1,749

This 42-in. Cub Cadet has electronic fuel injection, which eliminates many starting problems associated with ethanol fuel. Plus, it's more efficient, providing a 25 percent gas savings. The hydrostatic transmission is smooth, and the mow-in-reverse feature just requires turning the key. The fuel level windows let you check the tank without popping the hood, and the hour meter keeps track of run-times. Overall, a very solid machine for a reasonable price.



POULAN PRO PP20VA46 \$1,399

The Poulan PRO cuts a wide path (46 in.) and has a powerful two-cylinder 20-hp Briggs & Stratton engine. The CVT transmission operates with a rocker-style foot pedal, so you don't have to operate a shift lever to switch from forward to reverse. The deck engagement lever is located near the steering wheel, which makes it easy to operate without diverting your attention. It's a great machine if you need a wider cutting path but are watching your dough.



JOHN DEERE D155 \$2,200

This 48-in. lawn tractor has push-button blade engagement and push-button mow-in-reverse features, which make it a pleasure to use. The hydrostatic transmission was smooth and easy to operate. The fuel gauge is located right below the seat, so you can check it while driving. The seat is extra comfortable, and the unit comes with a front bumper—a feature we think should be standard on every lawn tractor.

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*May temporarily relieve common mild snoring in otherwise healthy adults. Partner Snore™ technology is available with Split King and FlexTop® King mattresses on FlexFit™ adjustable bases. †2-Year Limited Warranty on SleepIQ® technology. Warranties available at sleepnumber.com. ‡Results from a 2017 Sleep Number survey of 200 owners asked about their likelihood to recommend Sleep Number to a friend, family member, or colleague. SLEEP NUMBER, SELECT COMFORT, SLEEPIQ, IT and the Double Arrow Design are registered trademarks and SLEEP NUMBER 360 is a trademark of Sleep Number Corporation. ©2018 Sleep Number Corporation

EASY CRATE SHELF

*Hang up your
crates, take
them down—
this convenient
rack can handle
a lot of stuff!*

By Jeff Gorton

*Openings can
face up or out!*



Wooden crates are a staple at flea markets and antiques stores, but now you can also buy them at home centers. The crates shown here cost about \$10 each, and are sturdy enough to hold books and record albums. We wanted a quick and convenient way to hang the crates, and easily take them down if needed, so we devised this simple hanging rack.

The rack is just a 1x8 board with hangers every 16 in. We assembled the hangers from machine screws, nuts and aluminum bar stock. The most difficult part of the project is cutting the aluminum and drilling the holes. And even this is simple enough for a beginning DIYer.



Display or storage for any room

- Crates are available in various shapes and sizes
- Apply a clear finish, stain or paint
- They're easy to hang and take down



WHAT IT TAKES

TIME 1 hour	COST \$15 plus crates (\$10 each)	SKILL LEVEL Beginner
-----------------------	---	------------------------------------

TOOLS
Drill, 3/4-in. or larger spade bit,
1/4-in. drill bit, hacksaw, square,
adjustable or 7/16-in. wrench

To browse a variety of crates,
check out **cratesandpallet.com**



1. CUT THE ALUMINUM

Mark the bar at 7-1/4 in., clamp it to your workbench and cut it with a hacksaw, or a miter saw and a carbide blade. Dull the razor-sharp ends with 100-grit sandpaper.

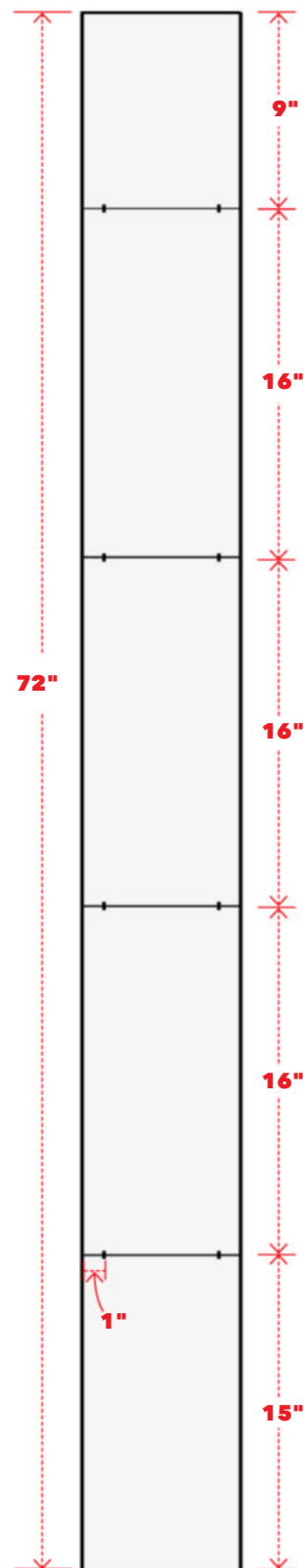
This is a simple project that you'll be able to finish in about an hour. Our crate rack can hold four crates, but you can make yours shorter or taller to fit your needs. It's designed to hold crates with 3/8-in.-thick slats. But you can easily modify it to accommodate crates with thicker slats by adding the right combination of nuts and washers to the machine screws. Remember, if you want to hang crates with slats thicker than 3/8 in., you'll need to increase the length of the machine screws accordingly.

Start by making the aluminum hangers. Use a square and a pencil or fine marker to mark the aluminum

bar. Clamp the aluminum bar to a solid surface and use a sharp, 32-tooth hacksaw blade to cut along the line (**Photo 1**). Aluminum is so soft that you can easily clean up and polish the cut end with sandpaper. When you're done cutting and smoothing the aluminum, mark the hole locations using **Figure B** as a guide and drill the holes (**Photo 2**). Finish the hangers by threading on the nuts (see **Photo 4**).

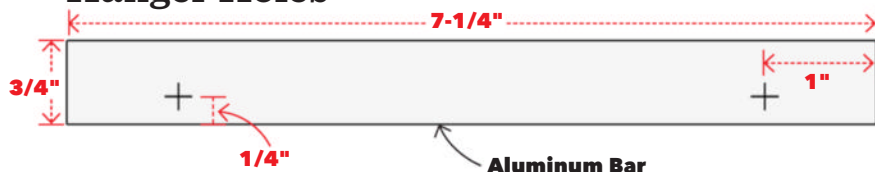
The next step is to drill holes in the 1x8 to accept the hangers. Choose the best-looking side of the 1x8 to face out. Then turn the board over and use the dimensions in **Figure A** to draw square lines across the back of the 1x8. Mark

Figure A
Hole Locations
for the 1x8 Board



OVERALL DIMENSIONS:
72" TALL x 7-1/4" WIDE

Figure B
Hanger Holes





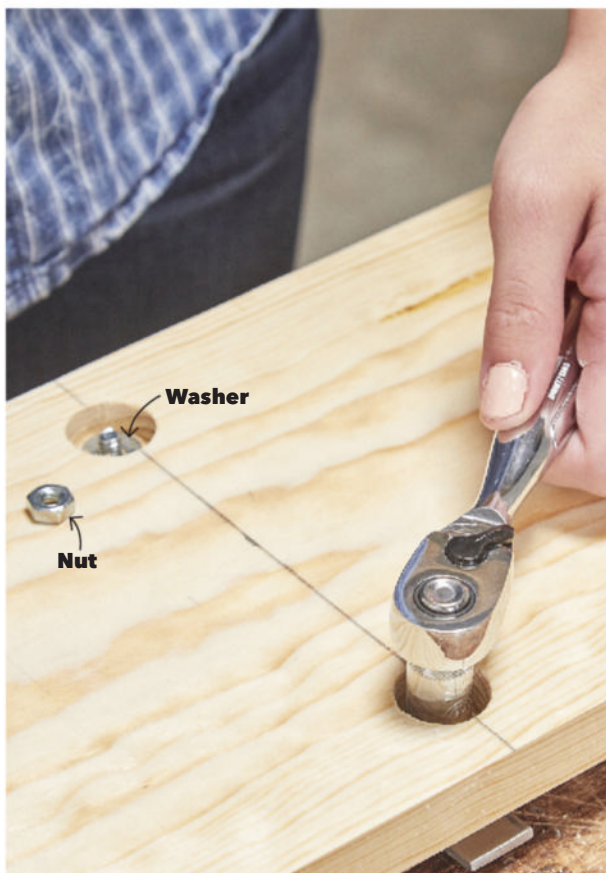
2. DRILL HOLES FOR THE BOLTS Mark the aluminum using Figure B on p. 52 as a guide. Drill a 1/16-in. hole at each mark. Then enlarge the hole by drilling with a 1/4-in. bit. Clamp the completed aluminum hanger on a blank hanger. Drill 1/4-in. holes using the completed hanger as a guide.



4. MOUNT THE HANGERS Slide the machine screws through the holes in the board. If the fit is too tight, enlarge the holes in the rx8 slightly by wiggling the 1/4-in. bit in the hole while the drill is running. Put a machine screw into each hole and thread two nuts onto each screw. They only need to be finger-tight.



3. MARK AND DRILL THE BOARD Mark the hole locations on the back of the board. Drill 3/8-in.-deep recesses with a spade bit. Then drill out the center with a 1/4-in. bit.



5. TIGHTEN THE HANGER NUTS Add washers and thread the nuts onto the machine screws. Tighten the nuts with a wrench.

6. SCREW THE BOARD TO A STUD

Locate a stud in the spot where you want to install the rack. Screw the top of the board to the stud. Use a level to plumb the board. Then drive a screw through the bottom.



the hole locations and drill recesses and mounting holes (**Photo 3**). Mount one of the hangers on the board (**Photos 4 and 5**) and check the fit by sliding one of the crates onto the hanger. The crate slat should slip easily behind the aluminum bar. If the fit is too tight, remove the hanger and add a washer to the bolt. Mount the hangers, along with additional washers if needed, to complete the project.

Because the crate rack with crates could be quite heavy, we recommend that you mount it to a stud or other solid wood (**Photo 6**). If there isn't a stud in your ideal location, use two heavy-duty hollow-wall anchors like the Toggler brand Snaptoggle anchors instead.

MATERIALS LIST

Everything you need to build this crate rack is available at home centers.

1x8 PINE BOARD: We used a 6-ft. board, but you can match the length to the number of crates or baskets you want to hang. Choose a straight board that's not twisted or cupped.

CRATES: We purchased crates at a home center. To see a variety of crates and find retailers, visit cratesandpallet.com.

1/8-IN. x 3/4-IN. ALUMINUM BAR: Allow 8 in. for every crate hanger. This project required a 3-ft. length.

NUTS AND MACHINE

SCREWS: You'll need two 1/4 x 20 machine screws 1-1/4-in. long and six 1/4-in. nuts for every hanger. That's eight machine screws and 24 nuts for this project.

SPADE BIT: The size isn't critical, but it must be at least 3/4 in.

HACKSAW: A blade with 32 teeth per inch is ideal. Check the label to find out.

HANGING HARDWARE: You'll need two 2-1/2-in. screws or two heavy-duty drywall anchors to hang the crate rack.

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RESTORE A *weedy & patchy* LAWN

WORK A LITTLE, WATER A LOT—AND THEN ENJOY!

By Joe Churchill



RESEEDING SAVED MY PATHETIC LAWN



One of the best things about working at *The Family Handyman* is having lots of pros at my fingertips. This time it was Joe Churchill, our lawn expert. Last summer we met in my backyard, and he told me exactly how to restore my ugly lawn. And by fall, I had the best-looking lawn in the neighborhood. Aside from the weed killing and watering, the restoration took just one weekend, and the results speak for themselves!

VERN JOHNSON,
ART DIRECTOR





1. KILL THE WEEDS

Use a hose-end sprayer to spray the lawn with a broadleaf weed killer at least three weeks before you plant the new grass seed. Wear eye protection, gloves, a long-sleeve shirt and pants, and waterproof shoes.



2. AERATE THE SOIL

Make at least three passes from three different directions with an aerator to loosen the soil.

Reseeding is a job you can do in a weekend if you have an average-size lawn. You'll have to wrestle home a couple of engine-powered rental machines. And once your work is done, be prepared to keep the soil damp with daily watering for the first month or so. It's the key to a successful reseeding job.

Before you establish this beautiful new lawn, be sure to do any hardscaping or landscaping—such as retaining walls, patios or tree planting—that might tear up your new lawn with heavy equipment or excavating. If an inground irrigation system is in your future, install that beforehand as well. You'll avoid damaging your new lawn by trenching in irrigation lines and sprinkler heads, and you'll have the benefit of using the system to water the new grass. Flag the sprinkler heads to avoid hitting them with the aerator or power rake.

Get better grass

Grass has improved dramatically in recent years, with varieties bred for better color, thicker turf or shade and drought tolerance. So reseeding doesn't just fill in the bare spots; it also improves the mix of grass varieties in your lawn.

Save the existing grass?

The steps we show here are for a lawn that's at least 50 percent grass. Take a close look at the lawn. If you see plenty of healthy grass among the weeds or large areas of good grass throughout the lawn, you can save the existing grass and fill in the rest of the lawn by planting new seed. That calls for applying a broadleaf herbicide, which kills the

WHAT IT TAKES

TIME: One weekend for an average-size lawn

COST: About \$10 per 100 sq. ft., including rental costs.

SKILL LEVEL: Beginner

TOOLS: Two rental power tools, plus a rake and a broadcast spreader

weeds but doesn't harm the grass. It should be applied three to four weeks before starting the project. A hose-end sprayer with concentrated weed killer is the fastest, easiest application method (**Photo 1**). But if your lawn is hopelessly bare or completely covered with weeds, it's best to go "scorched earth" and kill all the vegetation with a nonselective herbicide like Roundup and start over. If after two weeks, some weeds reappear, apply another treatment to the survivors.

Late summer or early fall is best

Timing is important when it comes to lawn reseeding. When summer heat begins to wane, it's much easier to stay on track with watering newly sprouted grass shoots because they won't be stressed by high heat and humidity. Plus, there will be plenty of time for the grass to get established before winter.

You'll be far less successful planting and growing grass from seed during spring and summer. If you must seed in the spring, wait for soil temperatures to reach a consistent 55 degrees F. Also watch for weeds! They can outcompete new grass seedlings as they both vie for space, sunlight and water. Using a seed-friendly herbicide is recommended in the spring or early summer if you have to treat emerging weeds after reseeding. And when choosing the starter fertilizer, look for one containing siduron or mesotrione pre-emergent herbicide, or be prepared for disappointing results.

Reseeding can be a crapshoot. A big thunderstorm could wash your seed away. So pay attention to long-range forecasts and plan accordingly. That's especially true if your yard is sloped enough that it doesn't take much water to wash away seed. Before you start the soil prep, set your mower to its lowest setting and give your yard a buzz cut.

Rent an aerator and power rake

There's no reasonable way to prep the soil by hand, so you should plan to rent an aerator (**Photo 2**) and power rake (also called a dethatcher;



- 3. PREPARE THE SURFACE** Pulverize the aerating plugs and loosen dead foliage with a power rake. Rake up and remove any vegetation that completely covers the soil.



- 4. OUTLINE GARDEN BEDS** Sow seed with a drop spreader near or around gardens or other areas where you want to avoid sowing grass seed.



- 5. SEED THE LARGE AREAS** Spread seed with a broadcast spreader in large areas away from gardens. Use half the recommended drop rate to spread the seed in one direction. Spread the remaining seed in the opposite direction to ensure even distribution.

Photo 3) for about \$100 each per day. Lifting them into and out of the pickup will require a helper, but operating them doesn't require an athlete's physique. The worst part is that you'll be marching around the yard following the self-propelled machines for many, many passes. Unless you have a small yard, plan to aerate it in one day, then return the aerator the following day and rent the power rake to finish the heavy work. Day two would also include planting, raking and fertilizing.

Aerate like crazy

Aerators pull small plugs from the soil and deposit them on the surface (**Photo 2**). That loosens the soil, making it easier for roots to grow deep into the soil. The plugs will be pulverized in the next step, power raking (**Photo 3**), to form loose soil for the seeds to germinate in. The holes you create will allow fertilizer and water to penetrate deep into the soil for better retention. When you're using a core aerator to prepare soil for reseeding, the key is to make at least three passes—more if you have the stamina—each from a different direction.

Next step: power raking

Power rakes spin metal tines at high speed to scarify and loosen the soil as well as break up the aerator plugs. They also lift thatch from your lawn. Go over the whole lawn from two directions, then rake up and remove dead debris if it completely covers the ground and would prevent seed from contacting the soil.

Choose the right spreader

In most cases, a broadcast spreader (**Photo 5**) is the best choice because it evenly distributes seed or fertilizer for thorough coverage. If you have a large yard bordered by flower beds or vegetable gardens, use a drop spreader (**Photo 4**) to spread the seed near them before doing the majority of the yard with a broadcast spreader. Since the seed drops straight down, you won't be



6. RAKE IN THE SEED

Lightly rake the seed to establish good seed-to-soil contact.

HOW TO BUY QUALITY SEED

Quality seed mixtures contain different species and varieties of lawn grasses that will better adapt to your lawn's conditions. Don't try to save money when you shop for grass seed. Look for the highest-priced seed on the shelf and follow these tips:

- Pay attention to the label. The lower the amount of weed seed, crop seed and inert matter, the better.
- Consult your local county or university extension service for a list of recommended lawn seed varieties for your area. You can also check university websites for tips on how to purchase quality grass seed.
- For quality lawns in full sun, look for a high percentage of Kentucky bluegrass in the mix.
- Lawns containing heavy shade should be seeded with a mix containing 70 percent or more fine fescue.
- Fine fescues (creeping red, sheep's, hard, chewings) use less water and need less fertilizer and fewer mowings.
- Avoid mixtures containing annual ryegrass because it lasts for only one year!
- Stay away from unnamed varieties or "Variety Not Stated" (VNS) ingredients.

casting grass seed in your gardens by mistake.

Whichever spreader you use, set the feed rate at half (or less) of the recommended rate. When using the drop spreader around border gardens, overlap subsequent passes slightly for more even seed distribution. But when using the broadcast or drop spreader for the open areas, make two or more passes from different directions for even distribution. This is especially true when you're using a drop spreader so you

don't wind up with a striped lawn. If you don't own a broadcast spreader, buy one—don't rent it. You'll need it to keep your new lawn in tip-top shape after it's established.

Sow the seed

Applying too much or too little seed is a mistake. Here is a little hands-and-knees observation to let you know if you're applying the right amount. Picture a square inch of area on a freshly seeded area and count the seeds. Strive to

get about 15 or so seeds per square inch. After spreading, lightly rake the seed into the soil for good contact. It doesn't have to be completely buried. Some of the seed can still be showing.

Fertilize with a starter

Fertilizers used to contain nitrogen, phosphorus and potassium. But due to water pollution concerns, many states no longer allow phosphorus in ordinary lawn fertilizers. However, phosphorus is very helpful for root development, so it's important for starting new seed. At the garden center, look for fertilizer labeled "Starter" or "New Lawns." Your state may allow its sale for establishing new lawns or in gardens.

Water, water, water

An oscillating sprinkler works best for getting your lawn started. It covers a large area with even, light streams of water to prevent washing away seed. You'll only need to water for about 20 minutes at a time depending on your soil type. Unless it rains, you'll likely need to water at least twice daily. On hot or windy days, you may need to water even more frequently.

Closely monitor the soil to keep it damp, not saturated. Strive to maintain soil dampness to a depth of about 1/2 in. You'll need to do this for at least three weeks. If you're not diligent, you may throw away all your hard work and money. One dry, hot sunny day is all it takes to wipe out a new lawn. A \$25 timer for your hose, available at any garden or home center, might be helpful if you can't be home to water as needed. After the grass is 3 in. high, you can start mowing and begin a normal watering regime.



MEET THE EXPERT: Joe Churchill is a senior turf specialist for Reinders Inc. For over 30 years, he has helped lawn care companies, golf course superintendents and sports turf managers grow healthy, high-performing turf.



7. DISTRIBUTE THE FERTILIZER

Spread starter fertilizer over the yard. Follow the directions on the bag to determine how many pounds per 1,000 sq. ft.



8. WATER DAILY

Water lightly daily or twice daily in hot, dry or windy conditions to keep the soil damp, not wet.

SOIL WATERING GAUGE

Your goal is to water to a depth of 1/2 in. As a test, water for about 20 minutes, then drive a spade into the ground and look for the dark line near the surface indicating water penetration. That'll tell you if you should water for longer or shorter periods.



HomeCare+Repair

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

Add solar power to your shed



Do you have a shed or other outbuilding that could use light and/or power? In many cases, running an underground cable from your house to the building is the most economical way to go. But if the building is a fair distance from the house, so that wiring it would be a hassle or a large expense, consider a solar-powered system.

If you just need some light for putting away yard tools, you can get by with a simple system costing \$100 or less. But if you want AC power for tools or charging batteries, you'll need to spend more than \$3,000 for a high-end system.



MEET THE EXPERT:

Chris Pesce is a solar systems designer for earthtechproducts.com, a large online solar kit component seller.

Solar kits eliminate guesswork

You can cobble together your own system with individual parts, but that can be dicey. Matching the right collectors, charge controller and battery takes some know-how. If you want AC power, you'll also need an inverter that converts DC voltage to AC for outlets. All those components must be compatible and work together flawlessly or you'll have big

issues. Plus, the components have to be suited to the climate you live in. Some can handle extreme heat, cold or dampness while others can't. So unless you just want occasional short-term lighting, we recommend buying a kit.

You can find local or online companies by searching for "solar kits." Most companies will help you pick a kit or design one for you to exactly suit your needs. Shopping

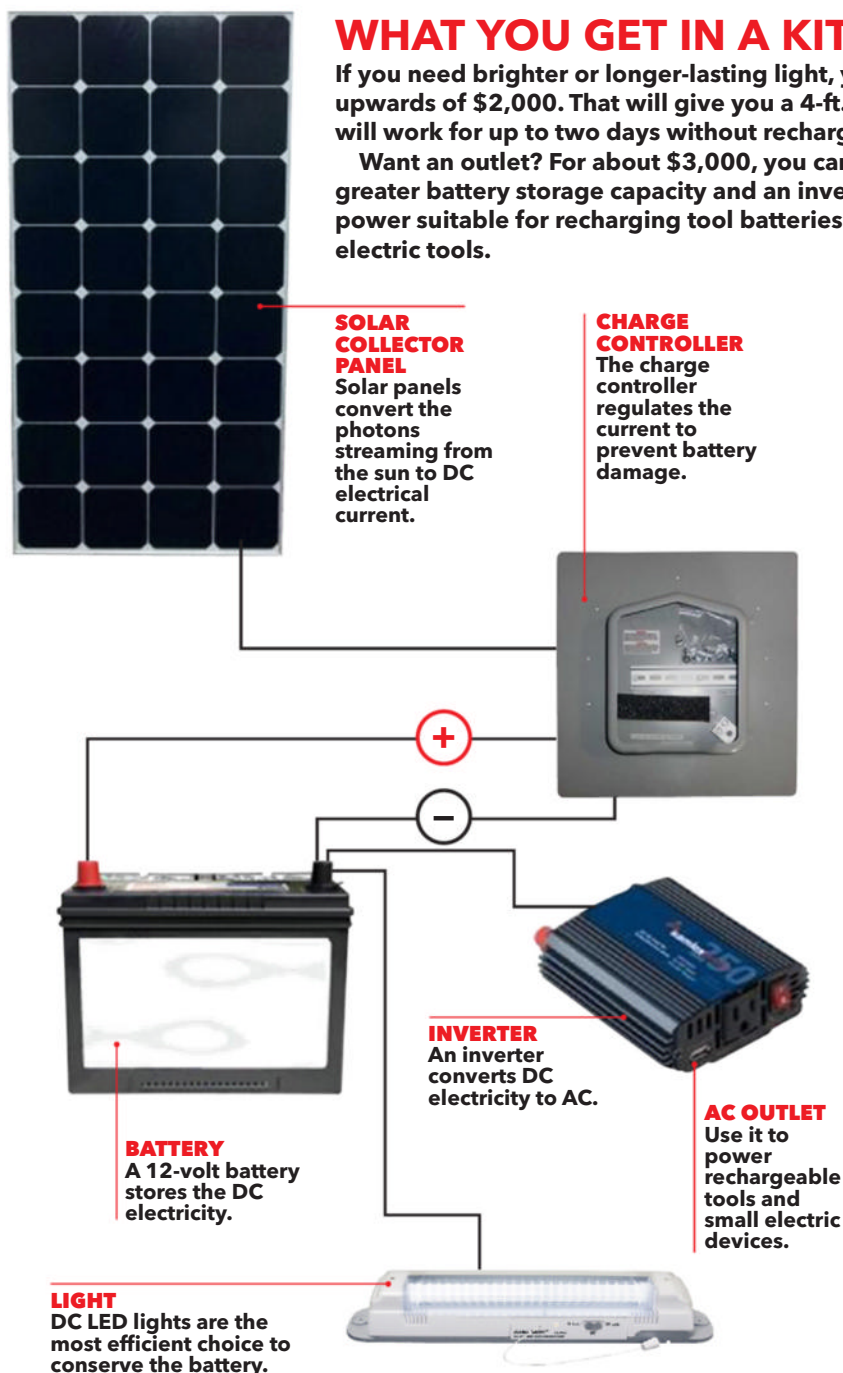
locally can save you big on shipping; this stuff is bulky and heavy. The kits listed below are from earthtechproducts.com.

You'll find many low-priced solar shed kits, and most of them work fine—for a while. But cheap kits often fail in about a year. So check the manufacturer's warranty and replacement terms before you buy, and try to find online reviews from long-term owners.

WHAT YOU GET IN A KIT

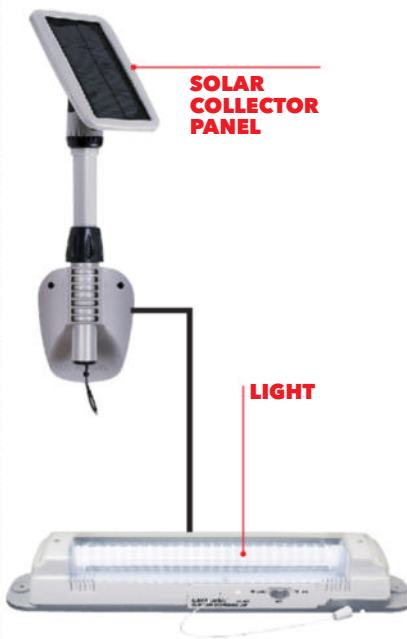
If you need brighter or longer-lasting light, you'll have to spend upwards of \$2,000. That will give you a 4-ft., 1,600-lumen light that will work for up to two days without recharging.

Want an outlet? For about \$3,000, you can purchase a kit that has greater battery storage capacity and an inverter that will provide AC power suitable for recharging tool batteries and powering small electric tools.



Just need short-term lighting?

You can use an inexpensive solar kit like the Gama Sonic No. GS-16LD (about \$110). The battery can power the light at 300 lumens (roughly equivalent to a 40-watt bulb) for one hour. The unit has a built-in night-light so you can find the light switch in the dark. A day of full sunlight recharges the batteries.





[SAVE THE BIRDS]

Keep feeders close to windows

At a conservative estimate of at least 1 billion deaths per year in the United States alone, window strikes are the main killers of wild birds. Here's a way to prevent some of these collisions at your home. Whenever you're placing feeders near the house, keep them no more than 3 ft. away from windows. That way a bird can't build up enough speed to sustain a fatal injury after feeding. This also brings the birds closer for better viewing.



OUR EXPERT
Daniel Klem is a professor of ornithology at Muhlenberg College in Pennsylvania.

[EXPENSIVE MISTAKE]

Don't buy an "R22" air conditioner

If you're in the market for a new central AC system, don't buy one that uses R22 refrigerant. As of January 1, 2020, production and importing of R22 refrigerant will be banned. It will still be available, limited to what is stockpiled and what can be recovered from old units. Eventually, there won't be any R22 left to buy. A loophole in the R22 phase-out program allows units that are already manufactured, but don't actually contain the refrigerant, to be sold to consumers as "dry units." R410a, the new refrigerant, can't be used in an R22 system, so if you're having your system replaced, make sure the new unit uses R410a refrigerant or you'll face expensive servicing issues in the future.

[BE CAREFUL OUT THERE]

LOCKSMITH SCAM ALERT

If you get locked out of your car or house and search online for a locksmith, scroll down the list until you find one with a local address and phone number. Many of those "800" listings are simply brokers who quote low rates and hire freelancers who show up and quote a much higher price because "your job is different."



[THE MASTER SPEAKS]

An electrical panel myth

We stumbled onto an online discussion in which a homeowner claimed his monthly electric bill dropped 30 percent after he installed a new circuit breaker panel. This seemed unlikely, so we contacted master electrician and inspector John Williamson to get his take.

"In theory, simply installing a new electrical panel wouldn't result in any energy savings because an electrical panel doesn't normally impose a load on the electrical system," says John. "The panel itself doesn't consume power. That said, I suppose an old panel could be in bad condition, with many loose or corroded connections, which may cause a resistance to current flow and create wasted power in the form of heat. But a 30 percent reduction in one's electrical bill doesn't seem plausible."

[LEARN FROM THE PROS]

TWO WIRE-SPLICING METHODS



Use a coat hanger to fish electrical cable through walls, and for longer runs, bare copper wire.

Cut your cable at an angle so its end is tapered instead of blunt. Leave the wire nearest the point of the angle cut about 3 in. longer than the other two wires. Straighten the coat hanger and make a small loop at the end.

Feed the wire through the loop and wrap it around the coat hanger. Start your tape wrap on the cable, above the splice. Tightly wrap the tape spirally until you've wrapped down onto the coat

hanger. Each consecutive wrap overlaps the previous one, reducing the possibility that a tape edge will snag on something when you're pulling it past obstructions.

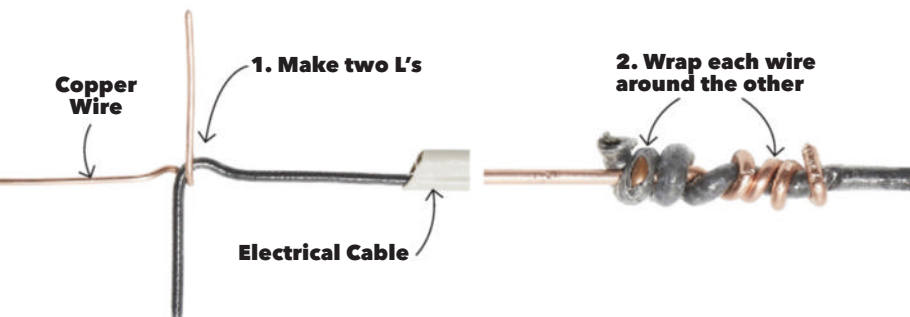
Copper wire isn't as stiff as a coat hanger, so it's likely to pull free of the coat hanger-style splice. If you're using a bare copper wire as your fishing tool, use a Western Union splice. Start with two L's, then wrap each wire around the other without looping them back on themselves. The taping step is the same for both methods.

AL HILDENBRAND,
MASTER ELECTRICIAN

COAT HANGER SPLICING



WESTERN UNION SPLICING



EITHER METHOD—WRAP WITH TAPE



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Workbench – Great
For Weekend
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Small Spaces

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Home Smarts

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

MAKE A SMALL ROOM LOOK BIGGER

You may not be able to add to your square footage, but with creative decorating and a few shortcuts and tips, you can make a room look like you did.

■ **Furniture with Legs Showing.** This draws the eye upward and creates the illusion of more light and open space.

■ **Ditch the Clutter.** Removing knick-knacks, artificial plants and other decorative items makes a space feel open and larger.

■ **Sheer Window Treatments.** Use the windows in a small room to bring light into every corner. Sunlight will make the room seem larger.

■ **Less Furniture.** Open floor space gives the appearance of more square footage.

■ **Choose a Light Color Scheme.** Lighter color palettes create the illusion of a larger area. Dark colors, although trendy, are best used in larger areas.

■ **Try Monochrome.** Choose a paint scheme using one color in varying shades and/or textures. This will keep the room open and airy.



PHOTO CREDIT: UNITED PHOTO STUDIO/SHUTTERSTOCK



BLOW OUT THE GARAGE

Forget the broom—just open the door and blast out the dust and debris with an electric leaf blower. Works great on porches, too. Be sure to wear a dust mask as well as eye and ear protection.

RENEW CABINETS

Cabinets are the largest cost on many kitchen remodeling jobs. But most old cabinets can be refreshed, even if they're in terrible shape.



Paint

You can make old cabinets look great, often for less than one-tenth the cost of new cabinets. If you're willing to do some tedious prep work, you can get beautiful, long-lasting results. To see how, go to familyhandyman.com and search for "paint kitchen cabinets."



Reface

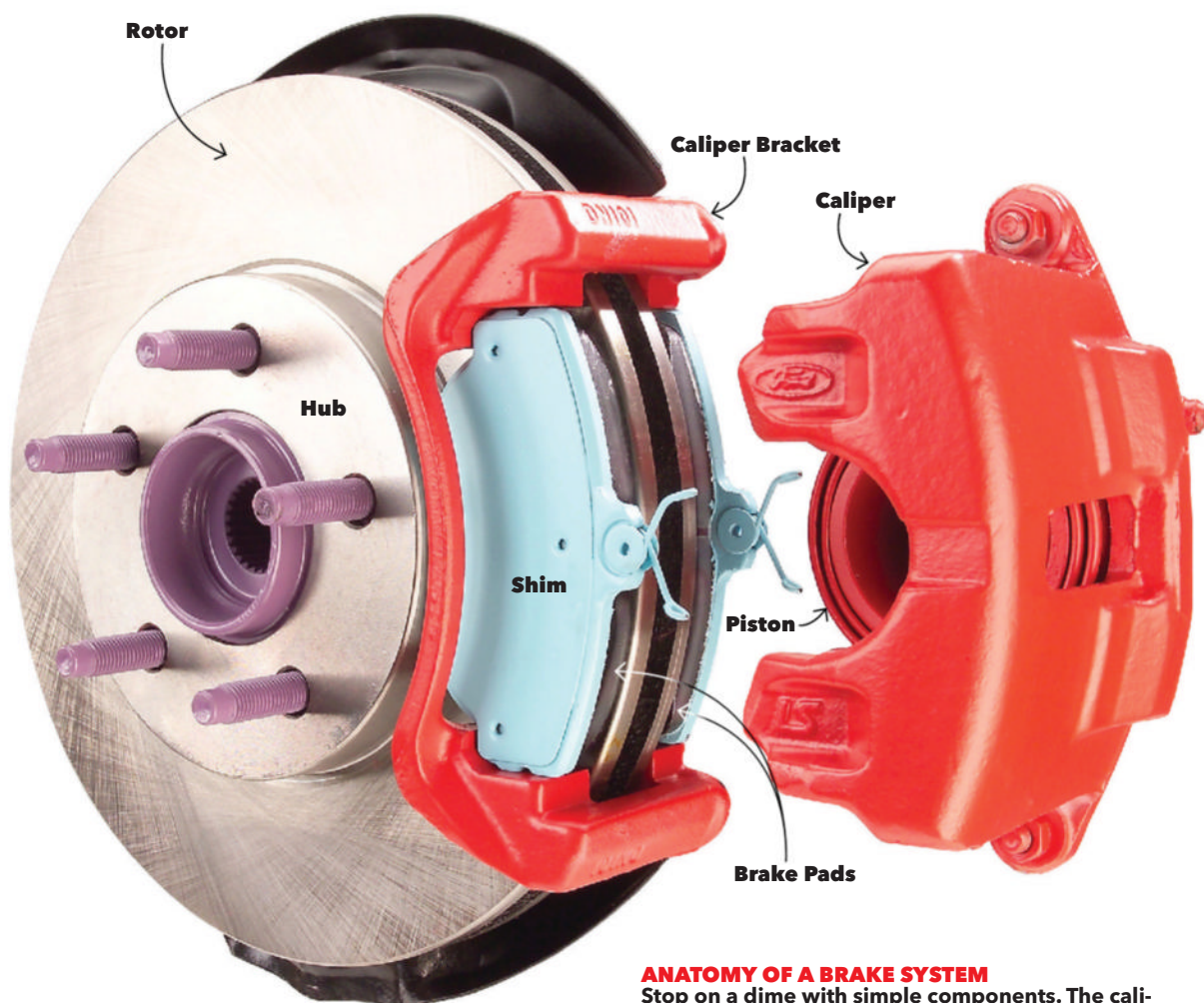
Refacing starts with a layer of real wood veneer applied to the frames. Add new doors and drawer fronts, and the cabinets will look entirely new. The pro cost is typically less than half the cost of new cabinets. For a step-by-step DIY guide, go to familyhandyman.com and search for "reface cabinets."

Car + Garage

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

Avoid the Top 4 Brake Job Rip-Offs

A typical vehicle will need at least three brake jobs during its lifetime. And if you don't learn how to spot the rip-offs, you'll waste upward of \$1,000 on parts and services you don't really need. Brake job rip-offs are far more common than you think. I'll lift the curtain on these shady practices and show you how to get a good brake job and avoid getting taken.



ANATOMY OF A BRAKE SYSTEM

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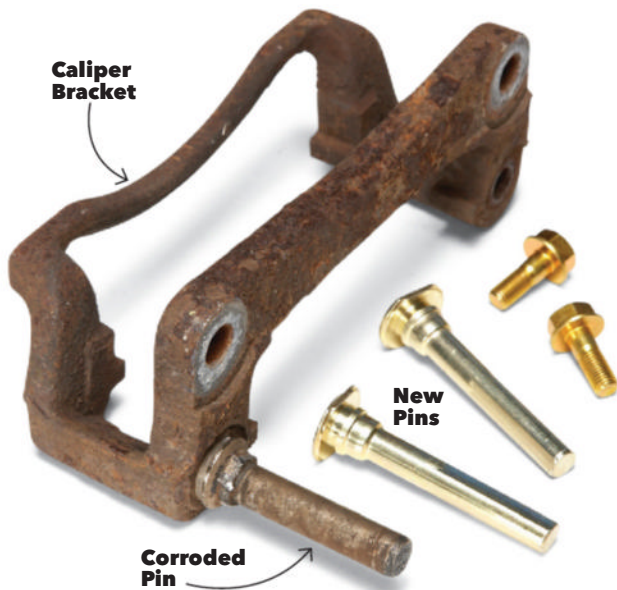
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NEW CALIPER PINS SAVE YOU \$300

Fix a binding caliper with new slide pins and high-temperature synthetic grease. That'll save you a fortune, and the caliper will slide freely for another 40,000 miles.

Rip-off #1

Buying calipers when you don't need them

Brake calipers work in a push-pull sequence to squeeze the brake pads against the rotors (see "Anatomy of a Brake System"). First, the caliper piston pushes the inboard pad outward until it touches the rotor. Then the caliper slides backward, pulling the outboard pad against the other side of the rotor. When you back off the brakes, the piston retracts slightly and the caliper releases pressure on the pads.

But if the caliper binds on the slide pins, the brake pads wear unevenly and quickly. Binding is a very common problem. However, that *doesn't* mean you have to replace the calipers (to the tune of \$300 per pair). Instead, the shop simply needs to replace the slide pins (\$20 total parts cost) and lubricate them with high-temperature synthetic grease. So if replacement calipers are recommended, ask if they can be fixed by replacing the slide pins.

In most cases, calipers can be reused. But don't argue if you're told that the brake caliper is leaking fluid or the piston won't retract. Then it must be rebuilt or replaced.

Rip-off #2

Paying a premium for generic pads

Lots of companies build mediocre brake pads and pass them off as a premium product at bargain basement prices. They're really no bargain because they wear out quickly, chew up your rotors and increase your stopping distance.

How can you tell the "real" premium pads from the impostors? First, top-quality brake part manufacturers always put their name on the box as shown below. And even though they may offer several quality levels (good, better, best), their "good" pads are almost always higher quality than a premium pad from a "no-name" company.

Second, real premium pads usually include all the required hardware (shims, anti-rattle clips and abutment clips) at no extra cost. So, if the shop claims it's installing premium pads, but the price quote includes additional charges for the hardware, well, you can tell where this is going.



YOU GET WHAT YOU PAY FOR

Insist on brand-name parts. Top-quality manufacturers are proud to put their name right on the package. Generic brake parts are almost always packaged in plain white or yellow boxes. Brand name? Nowhere.

Rip-off #3

Getting upsold to ceramic pads

There are lots of myths surrounding ceramic brake pads, and shops are happy to recite them to help you justify an "upgrade." They'll say that ceramic is simply the best brake pad material you can buy. Not true. Another is that they outlast semimetallic pads and provide better braking. Not true either. What is true about ceramics is that they run quieter and give off less brake dust—period.

If you haul heavy loads or do a lot of stop-and-go driving, semimetallic pads will last longer and provide *better braking* than ceramic pads. So, before you fall for the ceramic upgrade routine, think about what type of pad came with the vehicle and the kind of driving you do. If you do mainly light hauling and light braking and are really into the look of your aluminum wheels, then go for the ceramic pads.

Rip-off #4

Getting inferior rotors for premium prices

The brake parts market is flooded with inferior rotors that wholesale for as little as \$10 a pop. Some shops buy those instead of premium rotors, charge you the higher price, and pocket the difference. To the untrained eye, the generic rotors look just like the high-quality versions. But when you place them side by side, the differences are staggering. The friction surfaces on the generic rotors are noticeably thinner and they weigh about 20 percent less. With less metal to absorb heat and fewer cooling fins to dissipate it, the generic rotors heat up faster, warp more often (creating pedal pulsation), make more noise and simply wear out faster. They're a lousy choice all the way around—even if you're trying to save money.

Just as with brake pads, ask the shop for a quote that's based on brand-name professional grade (as opposed to "service" grade) rotors.

LESS METAL SPELLS TROUBLE

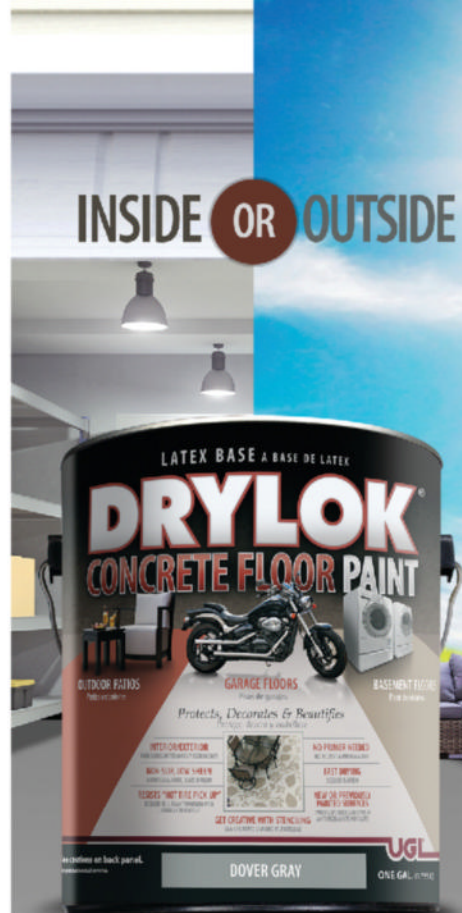
The economy rotor weighs 20 percent less than the premium brand.



How to find a reputable brake shop

Top-quality shops automatically use the best parts because they don't want "comebacks" (jobs redone at their expense). They charge you a fair price up front; they never use gimmicks or upselling. Call a few shops in your area and ask what brand, type and quality of pads and rotors they use. Here are some well-known brands: Bendix, Wagner, Raybestos, Hawk, Akebono, NAPA/United, Carquest, ACDelco, Centric, Monroe, Motorcraft, Brembo and EBC.

Once you find a shop that carries brand-name parts, ask for a price quote *over the phone*. Any reputable shop will provide a fairly firm quote that includes machining the rotors, replacing the slide pins, and installing high-quality pads and hardware. Shops don't need to see a vehicle to give a price—a brake job isn't brain surgery. If a shop balks at providing a phone quote, call a different one.



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

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



NO HANGIN' AROUND

Electrifying Wardrobe

Hanging clothes from exposed wiring is a bad idea. The heavy load of clothes could pull connections

loose, and the hangers could abrade the plastic insulation and expose the wire, potentially causing shocks or a fire.

Instead, mount a clothes rod. The small expense in time and materials could save your house and your life.



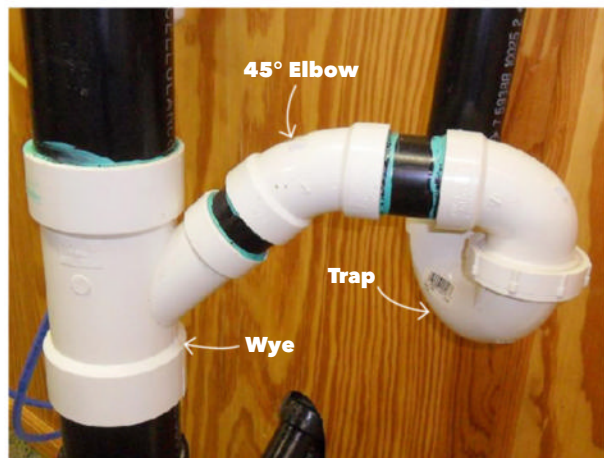
CORROSION CALAMITY

Cave dwelling pipes

This corroded joint is likely the result of a pinhole leak in one of the joints. Water seeps out slowly and evaporates, leaving behind these deposits.



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



A COMMON MISTAKE

WYE IS THIS WRONG?

Connecting a trap to a vertical drain with a wye fitting and a 45-degree elbow seems like a good idea. But it's not. As water drains down the steep slope at the wye, it can create a siphon effect such that water will be sucked out of the trap. And the empty trap will allow sewer gas to flow into your home.

Note: Joining ABS (black) pipe to PVC (white) may look like a blunder, but it's actually allowed by many local codes—as long as you use “universal” cement to glue them together.

THE RIGHT WAY:

When a trap connects to a vertical drain, install a tee fitting. A “sanitary tee” gives the waste arm a slight downward slope, enough for good flow, but not enough to create a siphon.



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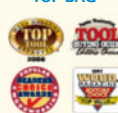
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WHAT'S WRONG



BACKDRAFT DANGER

Dangerous water heater vent

Hot air rises. And so do hot exhaust gases from a water heater. But if an exhaust vent slopes downward, as this one does, exhaust fumes containing poisonous carbon monoxide could leak into the house with potentially lethal consequences.



THE RIGHT WAY:

This vent is sloping upward until it connects to a vent pipe running up through the roof. The hot flue gas rises until it safely exits the building.

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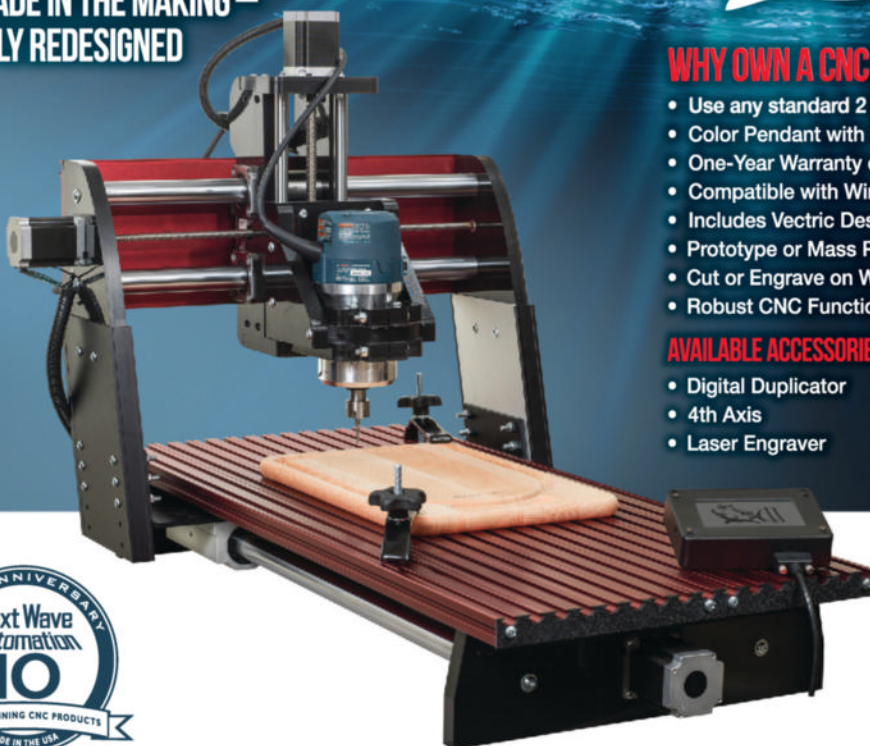


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BAD INSTALLATION

Low-down detector

It's hard to find anything good to say about the placement of this carbon monoxide (CO) detector. The biggest problem is that it's not in a good location to detect carbon monoxide. It's also in a place that's vulnerable to damage from vacuuming, dirt or a curious child.

THE RIGHT WAY:

Read the instructions included with your CO detector. In general, you should have CO detectors on every floor, and near every bedroom. Avoid placing CO detectors very near heating or cooking appliances, which could cause false alarms. Since CO is slightly lighter than air, you should try to place CO detectors high on the wall if possible, but at least 6 in. from the ceiling.



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Laughs and lessons from our readers



HOT AND COLD

I installed a programmable thermostat to save energy. The job had gone well—or so I thought until my wife kicked me at 4 a.m. The house was a frosty 45 degrees. I removed the new thermostat and duct-taped the old one back in place; I'd figure out the problem after work. When I heard the heat turn on, I smiled and went back to bed.

When I walked into the house that afternoon, a blast of hot air hit me. The weight of the thermostat had pulled the duct tape from the wall, leaving the thermostat set to "on." The gauge read 110 degrees!

JOHN LENHAM

OLD FATEFUL

The sewage ejection pump in our basement died. I had no trouble installing the new one, and finished in 20 minutes. It worked great... but the next day we found the carpet soaked with raw sewage and laundry water. I figured the float switch had gotten snagged on the electrical line.

Here comes the stupid part. I loosened the discharge line with the unit still plugged in! The jiggling of the pipe caused the float switch to work itself free, and the pump kicked in. The pressure blew the coupling apart and then the fun really began. Picture an open fire hydrant but with cold, stinky sewer water, drenching me and everything else within 10 ft.

TRAVIS FOWLER

BATHROOM BUST-OUT

I take my painting prep very seriously. So before painting the bathroom door, I removed the door handle rather than taping around it. But when I closed the door and heard the lock click, I realized I had left the latch in the door. "No need to panic," I thought to myself.

I fit the handle back into the door—but the latch wouldn't catch. I then tried to manually pull back the latch, but it wouldn't budge. Then I used my nail punch and hammer to remove the hinges—a sure bet—but the door was so tight in the frame I couldn't free it. There I was, trapped in my own bathroom.

I considered escaping through the window, but given the 9 in. of snow outside, my stocking feet and no key to get back into the house, I decided against it. Mild panic fueled a couple of karate kicks that split that hollow-core door into splinters. I think I'll paint the new door before I hang it.

RICH SHARBAUGH



What A Single Diet Soda Does

If you consume soda or know anyone who does, then this is affecting you directly.

For years, Big Soda companies have been handing out **millions of dollars** in an attempt to prove that their drinks are NOT the cause of obesity.

In fact, the New York Times recently exposed one Big Soda company that paid **\$1.5 million** to fund their own research group. Their ultimate goal? To convince the public that drinking soda is safe.
(The New York Times, 9 Aug. 2015)

But this goes beyond just soda. It turns out there are **THREE OTHER FOODS** that are being marketed as “health foods.”

These foods may be harming you from the inside, and they could **be the reason why you are not losing weight, no matter what you have tried.**

One of these foods even contains an ingredient that is



actually banned in almost every first world country – except the U.S., where it is still legal!

These are three foods you should never eat! But they're so common, you probably have at least one of them in your pantry right now! You may have even consumed these foods today.

Go to **www.BadFood25.com** to find out these foods.

P.S. These foods might be extremely harmful to your health. About 80% of Americans consume at least one of these foods. So please watch this shocking presentation at **www.BadFood25.com** before it's too late.

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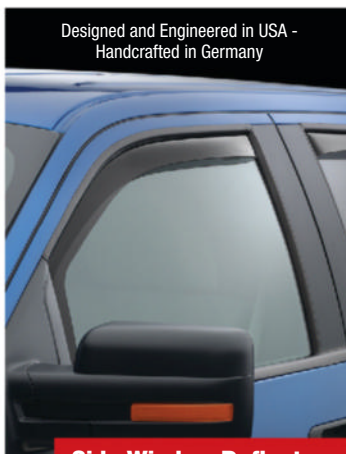
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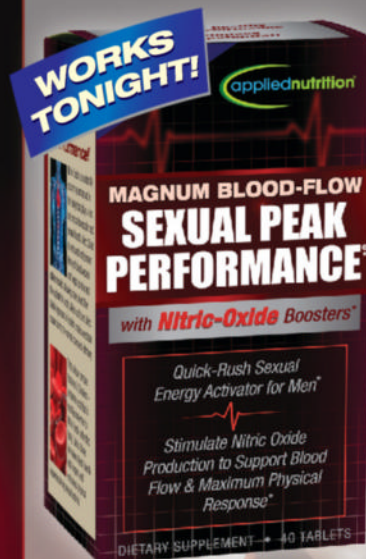
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THE FAMILY HANDYMAN® ISSN: 0014-7230, USPS: 515-930. Vol. 68, No. 1, 584th Edition. Published 8 times per year: March, April, May, June, July/August, September, October/November, December/January/February by Home Service Publications, Inc., 1610 N. Second St., Suite 102, Milwaukee, WI 53212. We may also occasionally publish extra issues and special issues (which count as two in a subscription). Periodicals postage paid at Milwaukee, WI, and at additional mailing offices. **POSTMASTER:** Send address changes to customercare@familyhandyman.com, visit familyhandyman.com/customercare or write to *The Family Handyman* Customer Care, PO Box 6099, Harlan, IA 51593-1599. **SUBSCRIPTIONS:** In the U.S.A., its territories and possessions, \$24 for one year (8 issues). For countries outside the U.S.A., subscriptions are \$28.97 per year in American currency. Canadian GST registration number R123771891. CPM agreement number 40065693. **Printed in the U.S.A.** Copyright ©2018 Home Service Publications, Inc. All rights reserved. Unauthorized reproduction, in any manner, is prohibited. *The Family Handyman*, Handy Hints and Great Goofs are registered trademarks of Trusted Media Brands, Inc. Wordless Workshop, Workshop Tips and  are trademarks of Trusted Media Brands, Inc. **SUBSCRIBERS:** If the U.S. Postal Service alerts us that your magazine is undeliverable, we have no further obligation unless we receive a new address within one year. **NEW CONSUMER INFORMATION:** *The Family Handyman* may share information about you with third parties for the purpose of offering products and services that may interest you. If you would rather not receive such offers via postal mail, please write to: *The Family Handyman* Customer Mailing List, PO Box 3122, Harlan, IA 51593-0188. You can also visit www.tmbi.com/preference-center to manage your preferences and opt out of receiving such offers via email. Please see our Privacy Policy at www.tmbi.com/privacy-policy.

How To: Get Rid Of Deep Belly Fat

Researchers have announced a radical technique that not only fights potentially belly fat, but can also lead to slimmer waists, and perhaps improved health.

The only catch? The establishment wants to spend 5 years – and \$65 million – testing this technology.

But one doctor thinks that the technology is so effective, it is immoral to make people wait.

So he's offering a version of the technique...now.

"The science has already been tested, and it's effective," says Dr. Rand McClain, Chief Medical Officer at Live Cell Research. "I can't make people wait 5 years for something that could be helping them today."

McClain is referring to a field of health research that is said to activate a "master switch" inside your body's cells.

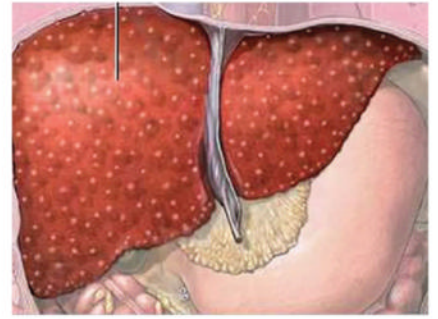
This switch controls when your cells store fat, and when they convert the fat into energy.

Control the "master switch," the theory goes, and you also control fat.

To researchers, this is far more than just an appearance issue. It could be even more important to Americans who mistakenly believe that small amounts of exercise can radically change their bodies.

According to Dr. Todd Miller, professor in the Department of Exercise Science at George Washington University, "People don't understand that it is very difficult to exercise enough to lose weight. If that is why you are doing it, you are going to fail."

So a way to battle belly fat could be the breakthrough the health community has been waiting for. McClain feels the technique works best for people over 30, particularly those who may be experiencing excessive fatigue, weaker bodies,



and even foggy thinking. Best of all, McClain announced that he is making his method available – and affordable – to virtually all Americans.

With demand already high for his stunning technique, McClain created an online presentation detailing how the health breakthrough works.

You can watch the presentation here at **www.NoFat39.com**

In this video, Rand is telling it like it is...we need more doctors like this!

People should be advised to watch the entire video report before committing to such an unconventional method.

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