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family handyman

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YOUR
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SPACE

CLEANING
TIPS
FROM
A PRO

GRILL
SKILLS
LESSONS
FROM
A MASTER
PAGE 60

IS DUCT
CLEANING
WORTH IT?
PAGE 73

MAY 2020
FAMILYHANDYMAN.COM

DIY PATIO
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A TIGHT BUDGET

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The New Z200

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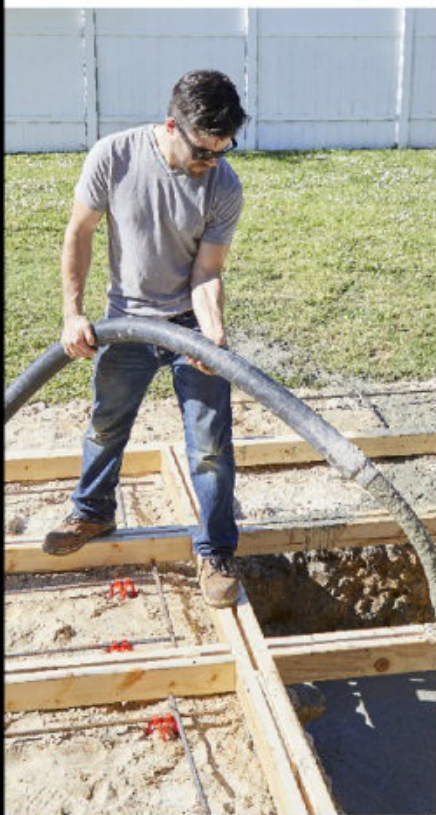
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3 THINGS

I learned this month

Nuggets of knowledge
picked up on the job

GARY WENTZ
EDITOR-IN-CHIEF



1 CONCRETE PUMPING IS AFFORDABLE

Back in college, I moved a lot of concrete by wheelbarrow. (My shoulders still hurt!) "Pump trucks," which pump concrete through a hose, were available, but college kids were a lot cheaper. Prices have come down since then. Pumping concrete from the street to our backyard patio cost us about \$200. See the results on p. 38. If you have a concrete job on your list, check on local pricing.

3 OUR CAMPER NEEDS SPECIAL TIRES

We bought an old camper! And the whole crew is on overdrive, making it better than new in every way, including spiffy whitewall tires.

Because whitewall trailer tires are crazy expensive (and I'm a cheapskate), I proposed regular car tires. Turns out that's a really bad idea. Trailer tires have stiffer sidewalls, which make the trailer more stable. With standard tires, our camper would sway like a sailboat and maybe even tug the towing vehicle off the road. To see our pricey whitewalls—and the rest of our awesome camper—stay tuned for the July/August issue.



2 BEST-EVER WORK GLASSES

I recently complained to my optometrist: With my standard prescription glasses, close-up work is blurry. With progressive lenses, I tilt my head all day and get a sore neck. He suggested a prescription optimizing my vision at about 24 in. from my face. He called this a "painter" prescription, because it's one he does for painters, electricians and others who work with their hands.

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family
handyman

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You can enjoy both the shade and the breeze in your own backyard getaway.

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This stunning patio is low maintenance too—and easier to make than a big slab.

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Are you ready to recline? We've got the perfect outdoor sofa for you!

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Build a beautiful cabinet to hold all your supplies—and get barbecue tips from a pro.

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Workshop Storage

A little bit of organizing will help you get a lot more done in your shop.



THIS EARTH DAY, SAVE SOME GREEN

This is the 50th Earth Day. That's pretty cool! Get in the spirit and save some green. New customers report average annual savings of over \$500. Get a quote and see how much you could save.



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84 Great Goofs®

A perfectly plaid lawn, the toothless brush cutter, and the washing machine blues.

Important Facts about IMBRUVICA® (im-BRU-vih-kuh) tablets and capsules

The risk information provided here is not comprehensive. To learn more, talk about IMBRUVICA® with your healthcare provider or pharmacist. For more information, call 1-877-877-3536 or go to www.imbruvica.com.

What is IMBRUVICA®?

IMBRUVICA® is a prescription medicine used to treat adults with:

- Mantle cell lymphoma (MCL) who have received at least one prior treatment
- Chronic lymphocytic leukemia (CLL)/Small lymphocytic lymphoma (SLL)
- Chronic lymphocytic leukemia (CLL)/Small lymphocytic lymphoma (SLL) with 17p deletion
- Waldenström's macroglobulinemia (WM)
- Marginal zone lymphoma (MZL) who require a medicine by mouth or injection (systemic therapy) and have received a certain type of prior treatment
- Chronic graft versus host disease (cGVHD) after failure of 1 or more lines of systemic therapy

It is not known if IMBRUVICA® is safe and effective in children.

What should I tell my doctor before taking IMBRUVICA®?

Before taking IMBRUVICA®, tell your healthcare provider about all of your medical conditions, including if you:

- have had recent surgery or plan to have surgery. Your healthcare provider may stop IMBRUVICA® for any planned medical, surgical, or dental procedure.
- have bleeding problems
- have or had heart rhythm problems, smoke, or have a medical condition that increases your risk of heart disease, such as high blood pressure, high cholesterol, or diabetes
- have an infection
- have liver problems
- are pregnant or plan to become pregnant. IMBRUVICA® can harm your unborn baby. If you are able to become pregnant, your healthcare provider will do a pregnancy test before starting treatment with IMBRUVICA®.
 - **Females** should not become pregnant during treatment and for 1 month after the last dose of IMBRUVICA®.
 - **Males** should avoid getting female partners pregnant during treatment and for 1 month after the last dose of IMBRUVICA®.
- are breastfeeding or plan to breastfeed. You and your healthcare provider should decide if you will take IMBRUVICA® or breastfeed.

Tell your healthcare provider about all the medicines you take, including prescription and over-the-counter medicines, vitamins, and herbal supplements. Taking IMBRUVICA® with certain other medicines may affect how IMBRUVICA® works and can cause side effects.

What should I avoid while taking IMBRUVICA®?

Do not drink grapefruit juice, eat grapefruit, or eat Seville oranges (often used in marmalades) during treatment with IMBRUVICA®. These products may increase the amount of IMBRUVICA® in your blood.

What are the possible side effects of IMBRUVICA®?

IMBRUVICA® may cause serious side effects, including:

- **Bleeding problems (hemorrhage) are common** during treatment with IMBRUVICA®, and can also be serious and may lead to death. Your risk of bleeding may increase if you are also taking a blood thinner medicine. Tell your healthcare provider if you have any signs of bleeding, including:
 - blood in your stools or black stools (looks like tar)
 - pink or brown urine
 - unexpected bleeding, or bleeding that is severe or that you cannot control
 - vomit blood or vomit looks like coffee grounds
 - cough up blood or blood clots
 - increased bruising
 - dizziness
 - weakness
 - confusion
 - change in your speech
 - headache that lasts a long time
- **Infections** can happen during treatment with IMBRUVICA®. These infections can be serious and may lead to death. Tell your healthcare provider right away if you have fever, chills, weakness, confusion, or other signs or symptoms of an infection during treatment with IMBRUVICA®.

- **Decrease in blood cell counts.** Decreased blood counts (white blood cells, platelets, and red blood cells) are common with IMBRUVICA®, but can also be severe. Your healthcare provider should do monthly blood tests to check your blood counts.
- **Heart rhythm problems (ventricular arrhythmias, atrial fibrillation and atrial flutter).** Serious heart rhythm problems and death have happened in people treated with IMBRUVICA®, especially in people who have an increased risk for heart disease, have an infection, or who have had heart rhythm problems in the past. Tell your healthcare provider if you get any symptoms of heart rhythm problems, such as feeling as if your heart is beating fast and irregular, lightheadedness, dizziness, shortness of breath, chest discomfort, or you faint. If you develop any of these symptoms, your healthcare provider may do a test to check your heart (ECG) and may change your IMBRUVICA® dose.
- **High blood pressure (hypertension).** New or worsening high blood pressure has happened in people treated with IMBRUVICA®. Your healthcare provider may start you on blood pressure medicine or change current medicines to treat your blood pressure.
- **Second primary cancers.** New cancers have happened during treatment with IMBRUVICA®, including cancers of the skin or other organs.
- **Tumor lysis syndrome (TLS).** TLS is caused by the fast breakdown of cancer cells. TLS can cause kidney failure and the need for dialysis treatment, abnormal heart rhythm, seizure, and sometimes death. Your healthcare provider may do blood tests to check you for TLS.

The most common side effects of IMBRUVICA® in adults with B-cell malignancies (MCL, CLL/SLL, WM and MZL) include:

- | | |
|------------------------|-------------|
| ◦ diarrhea | ◦ nausea |
| ◦ muscle and bone pain | ◦ tiredness |
| ◦ rash | ◦ fever |
| ◦ bruising | |

The most common side effects of IMBRUVICA® in adults with cGVHD include:

- | | | |
|-------------|----------------------------|-------------|
| ◦ tiredness | ◦ mouth sores (stomatitis) | ◦ pneumonia |
| ◦ bruising | ◦ muscle spasms | |
| ◦ diarrhea | ◦ nausea | |

Diarrhea is a common side effect in people who take IMBRUVICA®. Drink plenty of fluids during treatment with IMBRUVICA® to help reduce your risk of losing too much fluid (dehydration) due to diarrhea. Tell your healthcare provider if you have diarrhea that does not go away.

These are not all the possible side effects of IMBRUVICA®.

Call your doctor for medical advice about side effects. You may report side effects to FDA at 1-800-FDA-1088.

What are the ingredients in IMBRUVICA®?

Active ingredient: ibrutinib

Inactive ingredients:

IMBRUVICA® capsules: croscarmellose sodium, magnesium stearate, microcrystalline cellulose, and sodium lauryl sulfate. The 70 mg capsule shell contains gelatin, titanium dioxide, yellow iron oxide, and black ink. The 140 mg capsule shell contains gelatin, titanium dioxide, and black ink.

IMBRUVICA® tablets: colloidal silicon dioxide, croscarmellose sodium, lactose monohydrate, magnesium stearate, microcrystalline cellulose, povidone, and sodium lauryl sulfate. The film coating for each tablet contains ferrousferic oxide (140 mg, 280 mg, and 420 mg tablets), polyvinyl alcohol, polyethylene glycol, red iron oxide (280 mg and 560 mg tablets), talc, titanium dioxide, and yellow iron oxide (140 mg, 420 mg, and 560 mg tablets).

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For more information, go to www.imbruvica.com or call 1-877-877-3536.

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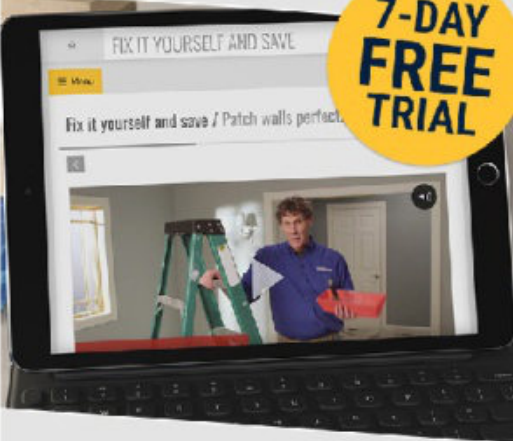


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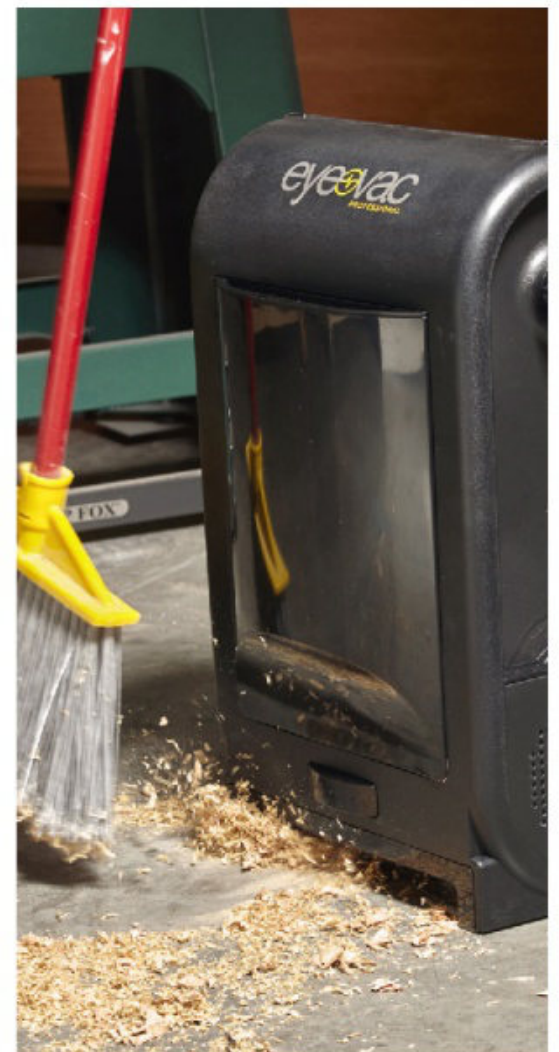
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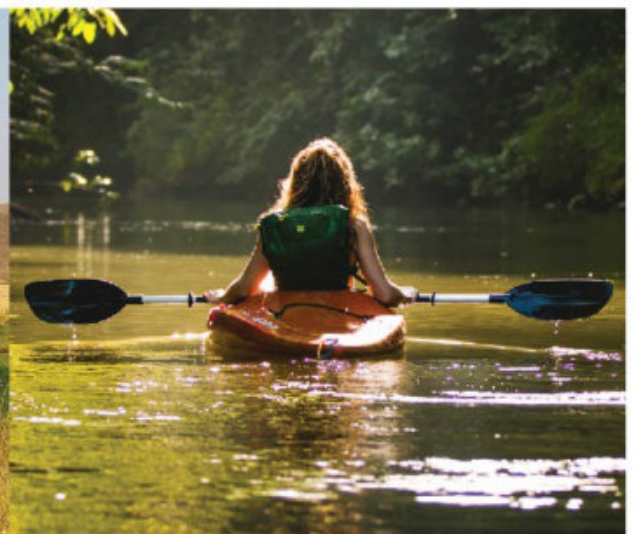
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Stuff We Love

Our favorite DIY tools, materials + gear

Painless paint pour

The traditional paint can lid deserves to die. You know the trouble: When you pour, paint fills the rim and dribbles down the outside of the can.

Behr's Simple Pour Lid eliminates that mess. It's a plastic version of the traditional lid, but it includes a spout for a cleaner pour. At last check, this ingenious design was available only on the Marquee line of paints. Note to Behr: Please put it on all your cans ASAP.

GARY WENTZ
EDITOR-IN-CHIEF



STUFF WE LOVE

Safer log splitting

Splitting kindling with an ax puts your fingers in the danger zone. The Kindling Cracker is a much safer solution, allowing you to put down the ax and grab a hammer instead. Just place the log in the ring and drive it through the wedge. It's safe enough for kids to use.

Invented by 13-year-old DIYer Ayla Hutchinson for a school project, the Kindling Cracker is now sold all over the world. It's available in two sizes (for \$100 and \$130) at Northern Tool.

NICK GRZECHOWIAK
CHIEF CONTENT OFFICER



Indicator lights

Exhaust port

Hose mount

Crush-proof hose

LONG-REACHING WET/DRY VACUUM

There are a lot of wall-mount garage vacuums available, but the Bissell Garage Pro stands out for all its features. It comes with a 32-ft. hose, so you can keep it mounted instead of rolling a vacuum all around your garage. The easy-off canister makes it a cinch to empty the debris, and the vacuum has indicator lights that tell you when it's full. It even acts as a blower when the hose is attached to the exhaust.

The vacuum kit comes with several attachments, a storage bag to stow them in, and a hose mount to keep everything organized. Find it online for about \$220.

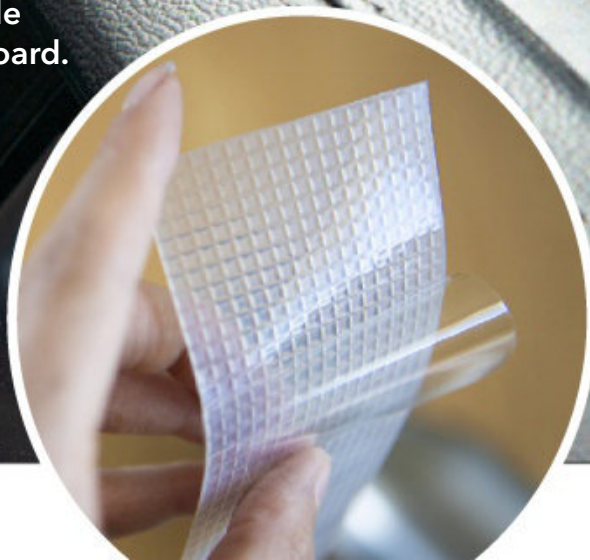
MIKE BERNER
ASSOCIATE EDITOR



STOP THE SLIP-SLIDE

CatTongue Grips grip tape gives a slick surface more traction. I used it to provide a no-slide phone holder on my dashboard. But it's also good for water bottles, kayak paddles, worn tool handles, the bottoms of boxes or bins that slide around in your truck bed... Find a 10-ft. roll for about \$20 online.

VERN JOHNSON
CREATIVE DIRECTOR



BOTTOM: LINKED RING



ONE-PIECE WRENCH SET

The Irwin Pliers Wrench is an entire wrench set in one tool. It works on any size nut up to 1-1/4 in. It's a pro plumbing tool intended for tightening polished hardware without marring the finish, but it can turn anything that will fit in its jaws. The two things that make it so great: the always-parallel smooth jaws and Irwin's GrooveLock mechanism. With the GrooveLock, adjusting the jaws to fit any nut is fast and easy. The 8-in. and 10-in. versions cost \$24 and \$30, respectively. Find them at home centers and online.

MIKE BERNER
ASSOCIATE EDITOR

Better metal cutting

When you combine ceramic with metal, you get cermet, a super-tough material perfect for cutting steel and other metals. Cermet has been an industrial favorite for years, and now Diablo is offering it to the rest of us. Aside from staying sharp much longer than carbide, the Steel Demon Cermet II blades cut quieter, cooler and cleaner (no burrs!). Prices start at about \$30 for 7-1/4-in. blades.

GARY WENTZ
EDITOR-IN-CHIEF



A MORE RELIABLE VOLTAGE SNIFFER

I've been frustrated with noncontact electrical testers because low-voltage stuff (even my 5-volt mobile phone charger) sets them off. I prefer the Fluke 2AC because it ignores low voltage, there's no on/off switch to mess with (it's always on), and a pair of "AAA" batteries will last a year or two.

I've had the Fluke 2AC for about three years now, and it has been the most reliable, rugged noncontact electrical tester I've owned. Some voltage sniffers cost as little as \$5, but my Fluke was well worth the higher price (about \$35 online).

REUBEN SALTZMAN
HOME INSPECTOR, STRUCTURETECH1.COM



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Key chain
tag

What's in the garden sprayer?

I use my garden sprayer for pesticides, herbicides and fertilizers. I was never able to remember what I last had in it, so I picked up some key chain tags at the hardware store. I add the product info to the tags and clip the corresponding one to the sprayer. Problem solved! Our model isn't wearing protective gloves; be sure you do!

CARROLL PETER

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DEDICATED NAIL PULLER

Nippers are great for pulling brad nails, but the sharp edges often cut the nail as you try to pull it out. Dull a pair of nippers slightly with a metal file and mark it as your designated nail puller. Use a cheap pair; higher-quality nippers with hardened cutting edges may not file easily. Shoot a few nails into a test board to get it just right.

DAN MASON



GOOF PROOF® SHOWERS



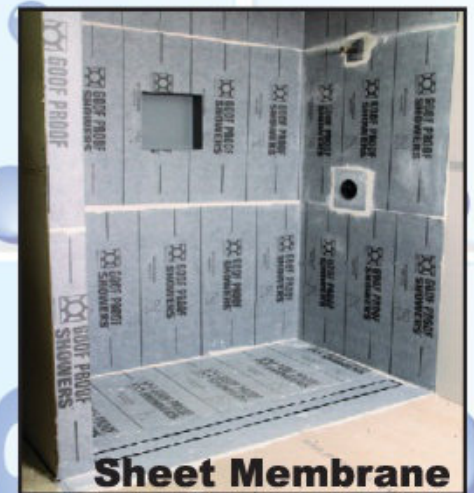
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NO-MEASURE MOUNTING

Here's a foolproof method to perfectly position the mounting screws for your power strip—no measuring necessary. Slide pan-head machine screws head first into the keyholes and over to their locked positions. Thread a nut on each one, just finger tight, to hold it in place. Set the power strip against the wall right where you want it, and push on it so the machine screws make slight indents in the wall. Drive screws (or anchors) into those spots and you're set!

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SIMPLE NOTE CLIP

Mousetraps make good note clips. I have one tacked on the wall over my workbench. I also fastened them near every stationary tool around my shop—they're effective and cheap!

BRUCE SANDEEN



TOTE BAG STIFFENER

Reusable grocery bags are easier to load if you add a little more structure. Cut a piece of tempered hardboard or plywood to fit the bottom. You can also insert a cardboard box—or make one to fit your bag perfectly.

ANNA JAKOWSKI

Loosen a stuck lid

Stubborn lids are no match for duct tape. Just wrap a piece around the lid, leaving a tail for a handle. Be sure the duct tape is fastened only to the lid, not the jar. Hold the jar with one hand and pull the handle with the other. If the jar is full of liquid, do this in the sink to avoid a mess.

MANNY NELSON

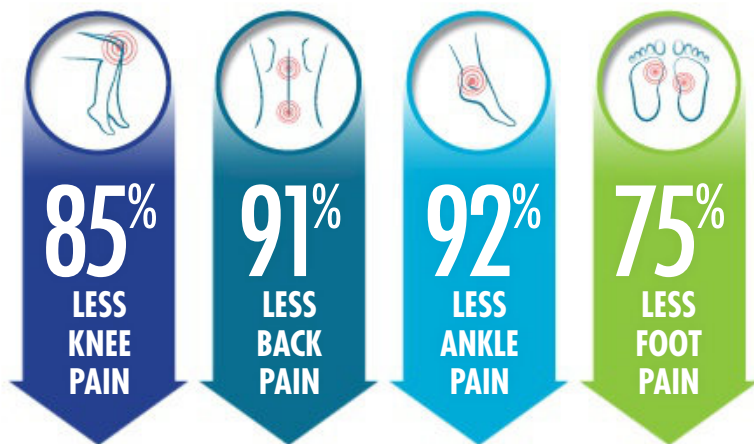


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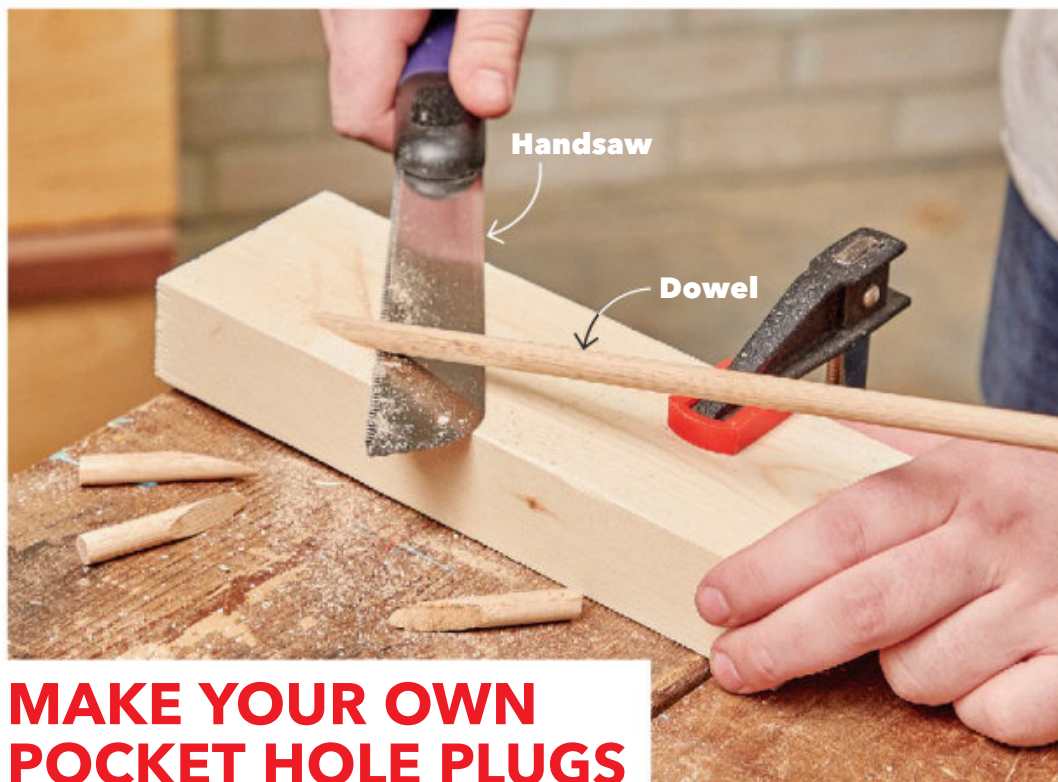


Tension rod

Extra shower storage

Need more space to hang storage bins in the shower? Next time you're at the home center, grab a shower curtain tension rod. Install it near the wall of your shower for 6 ft. of bin-hanging space!

IZZY OSMOND



Handsaw

Dowel

MAKE YOUR OWN POCKET HOLE PLUGS

Instead of buying pocket hole plugs, use this jig to make as many as you need. Drill a pocket hole into a 2x4. Then insert a 3/8-in. dowel and slice it off flush with the face of the 2x4. After making the angled cut, push the dowel through, cut the end at 90 degrees and repeat.

JACK OWEN



600-grit sandpaper

Craft knife blade

RENEW CRAFT KNIFE BLADES

Don't dispose of craft knife blades when they get dull. Instead, sharpen them. All it takes is a small piece of glass or a flat surface and a piece of 600-grit sandpaper. Carefully hone both beveled faces of the blade until it cuts like new.

KARI ALEXANDER



Watering chores, water bills! Sweating behind a roaring mower! Spraying poison chemicals and digging weeds...



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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.

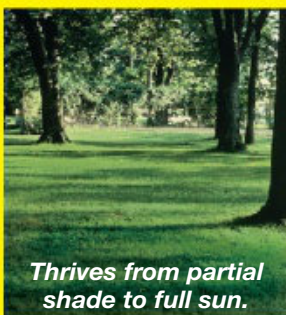
4 FOR SLOPES, PLAY AREAS, BARE SPOTS AND PARTIAL SHADE

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.

Your Assurance of Lawn SUCCESS Amazoy Zoysia Grass is GUARANTEED

Guaranteed to grow new green shoots within 45-60 days or we'll replace it FREE – for up to 1 year – just call us. Guarantee is valid on one order at a time, typically the most recent. We ONLY ship you hardy field grown genuine Amazoy Zoysia grass harvested direct from our farms. Easy planting and watering instructions are included with each order.

©2020 Zoysia Farm Nurseries, 3617 Old Taneytown Rd, Taneytown, MD 21787

ORDER TODAY - GET UP TO 1000 FREESTYLE PLUGS - FREE!

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
300	—	2	\$29.95	\$15.00	—
500	+100	4	\$50.00	\$17.00	25%
750	+150	6	\$66.00	\$20.00	36%
1100	+400	10	\$95.00	\$30.00	44%
2000	+1000	20	\$165.00	\$50.00	52%

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	Tray	Your PRICE	+ Shipping	SAVINGS
15	—	1	\$24.95	\$10.00	—
60	+15	5	\$90.00	\$22.00	35%
95	+25	8	\$110.00	\$32.00	49%
120	+30	10	\$125.00	\$36.00	53%
180	+45	15	\$180.00	\$50.00	56%

EVERYTHING YOU NEED TO START AND MAINTAIN A CAREFREE BEAUTIFUL ZOYSIA LAWN

Zoysia Farm
NURSERIES

Improving America's Lawns Since 1953
3617 Old Taneytown Rd./Taneytown, MD 21787

PLANTING TOOLS • PLANT FOOD • WEED AND PEST CONTROLS • ORGANIC PRODUCTS
SOIL TESTS • GARDEN GLOVES • EDGING AND MORE... ALL AVAILABLE EXCLUSIVELY AT:

www.ZoysiaFarms.com/mag OR 410-756-2311

Dept. 5538

Harvested Daily from Our Farms and Shipped to You the Same Day the Plugs are Packed

Amazoy is the Trademark Registered U.S. Patent Office for our Meyer Zoysia grass.

Savings shown over aggregate base price and shipping

homeLAB

A TESTING ZONE FOR *INNOVATIONS*

DRYWALL ANCHORS, *WEIGHT- TESTED*

BY JASON
INGOLFSLAND

When you need to hang something in a spot without a stud, drywall anchors are the way to go. But can they be trusted to bear the rated weight? We were skeptical. So, we picked up seven drywall anchors at a local home center and a few others online to subject them to a stress test. Here's what we found.

The homeLAB test

We installed each anchor in 1/2-in. drywall, following the manufacturer's instructions. Then we hung a tension scale from the anchor and fastened it to a hook screwed into a 2x4 fastened to the wall studs. Slowly, we twisted the turn-buckle and watched as the tension increased until the anchor buckled.

The results

All the anchors we tested lived up to the claims, and all but one exceeded their weight rating.



TENSION SCALE
When tension is applied, this scale measures weight in pounds.

TURNBUCKLE
Turning increases the tension on the scale, providing a weight reading.

HOLD-DOWN
A 2x4 screwed to studs provides a solid base.

**BEST
VALUE**

**BEST
OVERALL**

Everbilt Ribbed

CLAIMED: 22 LBS.

TESTED: 80 LBS.

Given the modest claim, we didn't expect much from these, but we were amazed by their strength.

Cobra TripleGrip

CLAIMED: 45 LBS.

TESTED: 90 LBS.

This heavier-duty anchor snaps into place when the screw is installed, but it performed about the same as the Everbilt Ribbed.

Pop Toggle

CLAIMED: 60 LBS.

TESTED: 130 LBS.

This anchor clips to the back of the dry-wall and creates a tight bond. In our test, they held more than twice their rated weight.

E-Z Ancor Twist-N-Lock Medium Duty

CLAIMED: 75 LBS.

TESTED: 100 LBS.

The E-Z Ancor is a great multipurpose choice. They're widely available, inexpensive and easy to install (no need to drill a hole).

Toggler SNAPTOGGLE

CLAIMED: 80 LBS.

TESTED: 180 LBS.

This anchor held strong at 180 lbs., and we couldn't turn the turnbuckle any more. They're overkill for most projects, but sometimes the job calls for maximum strength.

Cobra DrillerToggle

CLAIMED: 90 LBS.

TESTED: 140 LBS.

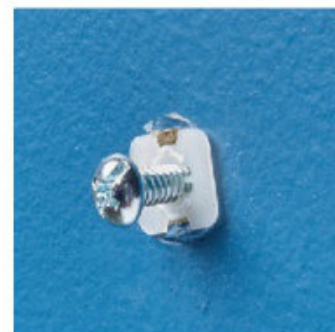
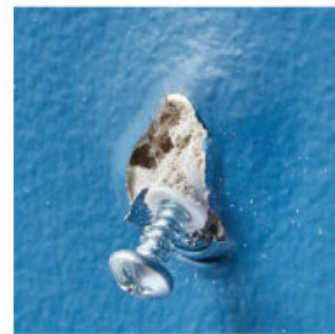
This anchor screws into drywall. Then, as you drive in a screw, a metal arm tightens against the back of the drywall.

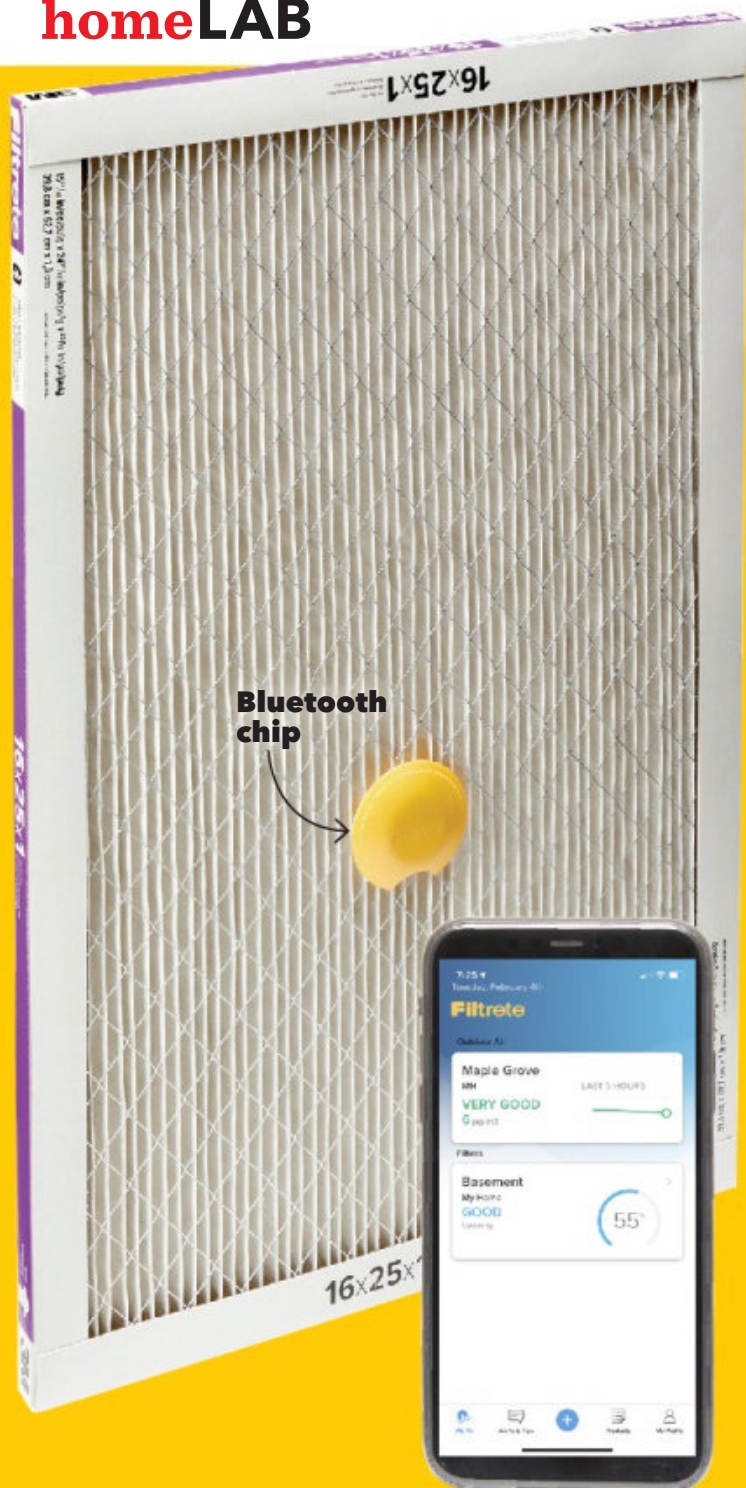
WallClaw Anchor

CLAIMED: 90 LBS.

TESTED: 90 LBS.

Easy to install with no drilling required (you use a hammer), this stays true to its weight rating. But once over that, several popped right out of the drywall, leaving a big hole.





SMART FILTER STOP GUESSING WHEN TO CHANGE YOUR FURNACE FILTER

The best thing you can do to avoid furnace problems is to change your furnace filter, but that can be a guessing game. You can mark a date on the calendar, but you might be changing it too early or too late. The time to change it is when it's dirty, not according to the calendar.

To remove the guesswork, the Filtrete Smart Air Filter 1500 uses a Bluetooth chip to track the airflow and usage of the filter and notify your smartphone when it needs replacing. We installed one and found it easy to pair to our smartphone. It updates frequently, letting us know the current status of the filter, and informed us when the filter needed to be changed. You can find the Filtrete Smart Air Filter 1500 for about \$22 at home centers and online.

FINGERPRINT SENSOR LOCKS— THE NEW TECHNOLOGY IS BETTER

I found the old optical fingerprint lock technology to be unreliable, slow and inconvenient. It made me steer clear of the technology. So, when I saw the fingerprint sensors on the latest latches, dead bolts and padlocks, I was wary. They claimed speed, reliability and security, but it seemed too good to be true. So, I got my hands on a Lockly Secure Pro (\$329) and a couple of Tapp padlocks (\$39 to \$99) to see how well they worked. Here's what I found.

A LOCK THAT SENSES ELECTRICAL CURRENT

Some fingerprint locks use optical sensors that take an image of your fingerprint. The locks I tested, however, use capacitive fingerprint sensors that collect data about the ridges and valleys of your fingerprint with electrical current.

DOESN'T WORK WITH WATER

All three locks failed to open when wet. The Lockly Secure Pro and the Tapplock Lite wouldn't open with my hands wet. The Tapplock One+ has an IP67 waterproof rating, meaning it's temporarily protected when immersed in water. So, I dunked it in water and tested to see if it would open. It did not. Needless to say, opening these locks on rainy days or after a swim would be difficult.

OPENS IN LOW TEMPERATURES

The Lockly Secure Pro and the Tapplock models both opened in freezing temperatures in every test without skipping a beat.

UNLOCKS IN 3 SECONDS OR LESS

These fingerprint scanners are very fast! I did several tests for their speed and consistency, and they passed with flying colors. They usually unlock in about three seconds. It's satisfying to open a lock without dealing with keys or codes.

JASON INGOLFSLAND
ASSOCIATE EDITOR



A SMART LOCK WITHOUT WI-FI

The Lockly Secure Pro that I tested connected to Wi-Fi. But if you're concerned about connecting your front door to the cloud, there are fingerprint-only models too.

homeLAB showdown:

Smart dimmer switches

Old dimmer switches are great for mood lighting, but they have control limitations. Smart models improve on the old, giving you more control. Several have hit the market, but which one is currently the best? Here's what we found and what you need to know about smart dimmer switches.

Dim the lights by voice

Hands-free control for your lights is an awesome convenience. With smart dimmer switches, you can connect them to Wi-Fi and control them using your smart assistant and smartphone. With our Amazon Echo in the homeLAB, all we have to say is, "Hey Alexa, turn on the lights," and the room lights up. You

can also dim the lights to a certain percentage. This is a great feature when you're away from the switch and the room is too dark or you want mood lighting.

Program for night and day

With smart dimmer switches, you can program your lights for any time of day. If you want your living room lights to dim at night, smart switches can adjust based on the time of sunset. This is also a perfect way to program "away" lighting.

Not a smart bulb replacement

Smart dimmer switches don't replace smart bulbs; dimmers can't adjust warmth and color, for

instance. But you won't have to replace a dimmer switch as you would a smart lightbulb, and they're useful for rooms lit by recessed lights, and for light fixtures that require unique lightbulbs.

Check for a neutral wire

Some dimmer switches require a neutral wire. Before you buy a smart dimmer switch, check your junction box for an available neutral wire.



WEMO WI-FI SMART DIMMER

\$60

PROS:

- Dimmable touch slider
- No bridge needed
- Easy install

CON:

- Not three-way switch capable



LUTRON CASETA SMART DIMMER

\$65

PROS:

- Convenient app
- Three-way switch capable
- Easy install

CON:

- Requires a smart bridge



LEVITON DECORA SMART WI-FI

\$50

PROS:

- Easy toggles
- No bridge needed
- Three-way switch capable
- Great app design and features



WOW! SUPER COUPON

SAVE 85%

1" x 25 FT. TAPE MEASURE

Customer Rating **★★★★★**

LIFETIME WARRANTY

PITTSBURGH

\$3.99 **WOW! 98¢**

COMPARE TO KOMETON \$6.98

MODEL: L4825NV

ITEM 69030/47737/69080/69031 shown

62545611

Coupon valid through 6/21/20*

SCISSOR SUPER COUPON

20% OFF

ANY SINGLE ITEM*

62545963

Limit 1 coupon per customer per day. Save 20% on any 1 item purchased. *Cannot be used with other discount, coupon or any of the following items or brands: Home Depot, Club membership, Extended Service Plan, gift card, open box item, 3 day Parking Lot Sale item, compressors, floor jacks, safety storage cabinets, sheets of car, trailers, welding, Admiral, Ames, Atlas, Bostich, Central Machinery, Cobra, CoverPro, Dayton, Diamondback, Eastpak, Fisher, Hercules, Home, Harbor Freight, Power, Predator, Ridgid, Viking, Vortex, Zoro. Not valid on prior purchases. Non-transferable. Original coupon must be presented. Valid through 6/21/20.

Bauer **SCISSOR SUPER COUPON**

15AMP, 12-1/2" PORTABLE THICKNESS PLANER

Customer Rating **★★★★★**

Powerful 15A, 9400 RPM motor for faster, smoother cuts in hardwood

Four-carriage frame reduces the movement that causes snipe

Two-knife cutter head leaves a blemish-free surface

Extra long in-feed and out-feed tables provide over 31" of material support

Handles lumber 12-1/2" wide to 6" thick

NOW \$299.99

COMPARE TO DEWALT \$449

MODEL: DW734

SAVE \$149

ITEM 63445

62547609

Limit 1 - Coupon valid through 6/21/20*

CENTRAL MACHINERY **SCISSOR SUPER COUPON**

70 GALLON, 2 HP HEAVY DUTY HIGH FLOW, HIGH CAPACITY DUST COLLECTOR

Customer Rating **★★★★★**

NOW \$179.99

COMPARE TO SHOP FOX \$405.99

MODEL: W1685

ITEM 61790/97869 shown

62547699

Limit 1 - Coupon valid through 6/21/20*

CHICAGO ELECTRIC POWER TOOLS **GOOD** **Standard Features and Accuracy** **SCISSOR SUPER COUPON**

12" DUAL-BEVEL SLIDING COMPOUND MITER SAW

Customer Rating **★★★★★**

Blade sold separately.

ITEM 56597

61970/61969 shown

3-1/2" VERTICAL CROWN MOLDING CAPACITY

2-5/8" TALL SLIDING FENCES

LASER GUIDE LIGHT

\$129.99 **\$159.00**

SAVE \$88

COMPARE TO PROFESSIONAL WOODWORKER \$218.71

MODEL: 18437

62549403

Limit 1 - Coupon valid through 6/21/20*

ADMIRAL **BETTER** **Superior Features and Accuracy** **SCISSOR SUPER COUPON**

12" DUAL-BEVEL SLIDING COMPOUND MITER SAW WITH LED AND LASER GUIDE

Customer Rating **★★★★★**

FREE BLADE INCLUDED \$19.99 VALUE

ITEM 64686

6-1/2" VERTICAL CROWN MOLDING CAPACITY

4-1/2" TALL SLIDING FENCES

LASER GUIDE LIGHT & LED WORK LIGHT

\$179 **\$199.00**

SAVE \$90

COMPARE TO RYOBI \$269

MODEL: TS120L

62551304

Limit 1 - Coupon valid through 6/21/20*

HERCULES **BEST** **Jobsite Features and Accuracy** **SCISSOR SUPER COUPON**

PROFESSIONAL 12" DUAL-BEVEL SLIDING COMPOUND MITER SAW WITH LED SHADOW GUIDE

Customer Rating **★★★★★**

FREE BLADE INCLUDED \$44.99 VALUE

ITEM 56682/63978 shown

7-1/2" VERTICAL CROWN MOLDING CAPACITY

4-3/4" TALL SLIDING FENCES

LED PRECISION SHADOW GUIDE LIGHT

\$329 **\$349.00**

SAVE \$270

COMPARE TO DEWALT \$599

MODEL: DWS700

62552248

Limit 1 - Coupon valid through 6/21/20*

HaulMaster **SCISSOR SUPER COUPON**

72" x 80" MOVING BLANKET

Customer Rating **★★★★★**

NOW \$5.99

COMPARE TO BLUE HAWK \$19.99

MODEL: 77280

SAVE 70%

ITEM 69505/62418/66537 shown

62548051

Limit 1 - Coupon valid through 6/21/20*

CHICAGO ELECTRIC POWER TOOLS **SCISSOR SUPER COUPON**

4" BISCUIT PLATE JOINER

Customer Rating **★★★★★**

NOW \$44.99

COMPARE TO MAKITA \$179

MODEL: PJ7000

SAVE \$134

ITEM 38437

68987 shown

62552857

Limit 2 - Coupon valid through 6/21/20*

CENTRAL PNEUMATIC **SCISSOR SUPER COUPON**

20 OZ. GRAVITY FEED AIR SPRAY GUN

Customer Rating **★★★★★**

1.4mm tip included

NOW \$9.99

SAVE 80%

COMPARE TO HUSKY \$49.98

MODEL: H4840SHVSG

ITEM 67181/62300/47016 shown

62554368

Limit 4 - Coupon valid through 6/21/20*

ADMIRAL **SCISSOR SUPER COUPON**

12", 80 TOOTH FINISHING SAW BLADE

Customer Rating **★★★★★**

NOW \$19.99

SAVE 66%

COMPARE TO DEWALT \$59.98

MODEL: BW3232PT X

ITEM 64911/62725 shown

62556858

Limit 4 - Coupon valid through 6/21/20*

CHICAGO ELECTRIC POWER TOOLS **SCISSOR SUPER COUPON**

MOBILE MITER SAW STAND

Customer Rating **★★★★★**

Supports 16 FT.

SAVE \$69

COMPARE TO HITACHI \$169

MODEL: UJ240F

NOW \$99.99

ITEM 63409/62750 shown

62559835

Limit 2 - Coupon valid through 6/21/20*

PITTSBURGH **SCISSOR SUPER COUPON**

12" RATCHETING BAR CLAMP/SPREADER

Customer Rating **★★★★★**

NOW \$2.99

COMPARE TO IRWIN \$19.98

MODEL: 1964718

SAVE 85%

ITEM 46807/63017/69222/62123 shown

62562659

Limit 4 - Coupon valid through 6/21/20*

HaulMaster **SCISSOR SUPER COUPON**

18" WORKING PLATFORM STEP STOOL

Customer Rating **★★★★★**

350 lb. capacity

NOW \$19.99

SAVE 50%

COMPARE TO NEOCRAFT \$39.99

MODEL: 60635

ITEM 62515/66911 shown

62562965

Limit 3 - Coupon valid through 6/21/20*

WARRIOR **SCISSOR SUPER COUPON**

29 PIECE TITANIUM DRILL BIT SET

Customer Rating **★★★★★**

NOW \$10.99

SAVE 83%

COMPARE TO DEWALT \$68.14

MODEL: BW1369

ITEM 5889/62281/61637 shown

62564060

Limit 4 - Coupon valid through 6/21/20*

drill master **SCISSOR SUPER COUPON**

1/4", 2.4AMP TRIM ROUTER

Customer Rating **★★★★★**

NOW \$19.99

COMPARE TO MAKITA \$99

MODEL: RT0701C

SAVE \$79

ITEM 44914

61626/64314/62659 shown

62565265

Limit 4 - Coupon valid through 6/21/20*

U.S. GENERAL SUPER COUPON Customer Rating ★★★★★

30", 4 DRAWER TECH CART

- 12,600 cu. in. of storage
- 580 lb. capacity



Side tray sold separately.

Item 56387, 56394, 56393, 56392, 64096, 56386

COMPARE TO Snap-on BLUE-POINT \$880
MODEL: KRBG16T8PC

SAVE \$730

YOUR CHOICE OF 6 COLORS
NOW \$149.99

~~\$199.99~~

62567785

LIMIT 1 - Coupon valid through 6/21/20*

BANKS SUPER COUPON Customer Rating ★★★★★

18 GAUGE BRAD AIR NAILER

- Great drive power for fastening all types of trim
- Lightweight and narrow tool design
- Ergonomic comfort grip
- Re-load indicator window
- 360 degree adjustable exhaust



COMPARE TO DEWALT \$89
MODEL: DWFP12233

SAVE 71%

~~\$32.99~~ **NOW \$24.99**

ITEM 64140

62568674

LIMIT 2 - Coupon valid through 6/21/20*

McGRAW SUPER COUPON Customer Rating ★★★★★

20 GALLON, 135 PSI OIL-LUBE AIR COMPRESSOR

- Air delivery: 4.0 SCFM @ 90 PSI



~~\$189.99~~ **NOW \$164.99**

COMPARE TO PORTER-CABLE \$249.99
MODEL: 118903799

SAVE \$85

ITEM 56241/64857 shown

62569249

LIMIT 1 - Coupon valid through 6/21/20*

PITTSBURGH SUPER COUPON Customer Rating ★★★★★

24" CLAMP EDGE AND SAW GUIDE

LIFETIME WARRANTY



COMPARE TO BORA \$70.28
MODEL: S43030K

SAVE 85%

~~\$13.99~~ **NOW \$9.99**

ITEM 66126

62569400

LIMIT 4 - Coupon valid through 6/21/20*

BRAUN SUPER COUPON Customer Rating ★★★★★

390 LUMEN MAGNETIC SLIM BAR LED WORK LIGHT



13-1/2"

~~\$39.99~~ **NOW \$24.99**

COMPARE TO ASTRO \$55.12
MODEL: 40SL

SAVE 54%

ITEM 56248/56329/63958 shown

62570600

LIMIT 2 - Coupon valid through 6/21/20*

CENTRAL MACHINERY SUPER COUPON Customer Rating ★★★★★

16" VARIABLE SPEED SCROLL SAW



COMPARE TO PORTER-CABLE \$199
MODEL: PC8375SS

SAVE \$129

~~\$99.99~~ **NOW \$69.99**

ITEM 62519/63283/93012 shown

62571982

LIMIT 1 - Coupon valid through 6/21/20*

HARDY SUPER COUPON Customer Rating ★★★★★

POWDER-FREE NITRILE GLOVES PACK OF 100

- 5 mil thickness



12¢ PER PAIR

AVAIL. IN SM, MED, LG, XL, XXL

~~\$7.99~~ **NOW \$5.99**

COMPARE TO VENOM \$14.97
MODEL: VEN4145

SAVE 59%

ITEM 37050, 64417, 61363, 68496, 68497, 61360, 61359, 68498, 64418 shown

62572356

LIMIT 4 - Coupon valid through 6/21/20*

CENTRAL MACHINERY SUPER COUPON Customer Rating ★★★★★

14" OSCILLATING SPINDLE SANDER



~~\$147.99~~ **NOW \$109.99**

COMPARE TO TRITON TOOLS \$152.99
MODEL: TSP5450

SAVE \$43

ITEM 62146/69257 shown

62573490

LIMIT 1 - Coupon valid through 6/21/20*

HaulMaster SUPER COUPON Customer Rating ★★★★★

18" x 12" MOVER'S DOLLY

- 1000 lb. capacity



COMPARE TO BUFFALO TOOLS \$22.99
MODEL: HOFBOLLY

~~\$10.99~~ **NOW \$7.99**

SAVE 65%

ITEM 60497

61899/62399/63095/63096/63097/63098 shown

62573751

LIMIT 4 - Coupon valid through 6/21/20*

Bauer SUPER COUPON Customer Rating ★★★★★

6.5AMP HEAVY DUTY TOOL-FREE VARIABLE SPEED ORBITAL JIG SAW WITH LASER



SAVE \$69

COMPARE TO MAKITA \$119
MODEL: JVD600K

~~\$54.99~~ **NOW \$49.99**

ITEM 64290

62573982

LIMIT 3 - Coupon valid through 6/21/20*

WINDSOR DESIGN SUPER COUPON Customer Rating ★★★★★

60" HARDWOOD WORKBENCH WITH 4 DRAWERS



Tools sold separately.

COMPARE TO GRIZZLY \$399.95
MODEL: H7723

SAVE \$279

~~\$149.99~~ **NOW \$119.99**

ITEM 63395/93454/69054/62603 shown

62574439

LIMIT 1 - Coupon valid through 6/21/20*

WINDSOR DESIGN SUPER COUPON Customer Rating ★★★★★

10" PNEUMATIC TIRE



~~\$6.99~~ **NOW \$3.99**

SAVE 50%

COMPARE TO FARM & RANCH \$8.09
MODEL: FR1055

ITEM 69385/62388/62409/62698/30900 shown

62576209

LIMIT 4 - Coupon valid through 6/21/20*

DE DIAMONDBACK SUPER COUPON Customer Rating ★★★★★

7" TILE SAW WITH SLIDING TABLE



~~\$269.99~~ **NOW \$239.99**

SAVE \$99

COMPARE TO KOBALT \$339
MODEL: KWS S7-06

ITEM 64683

62576277

LIMIT 1 - Coupon valid through 6/21/20*

PITTSBURGH SUPER COUPON Customer Rating ★★★★★

4 PIECE WOOD CHISEL SET



LIFETIME WARRANTY

~~\$7.99~~ **NOW \$5.99**

SAVE 80%

COMPARE TO DEWALT \$29.97
MODEL: DWHT16063

ITEM 42429/69471 shown

62577909

LIMIT 4 - Coupon valid through 6/21/20*

Lifetime CARBIDE SUPER COUPON Customer Rating ★★★★★

ALUMINUM OXIDE SANDING SPONGES PACK OF 10



Item 46751 shown

COARSE ITEM 46751/63918
MEDIUM ITEM 46752/63915
FINE ITEM 63912/46753

YOUR CHOICE **\$3.99**

SAVE 20% ~~\$4.99~~

62578274

LIMIT 4 - Coupon valid through 6/21/20*

PITTSBURGH #1 SELLING JACKS IN AMERICA SUPER COUPON Customer Rating ★★★★★

RAPID PUMP® 1.5 TON LIGHTWEIGHT ALUMINUM FLOOR JACK

- Weights 33 lbs.



~~\$79.99~~ **NOW \$59.99**

SAVE \$91

COMPARE TO K TOOL \$151.42
MODEL: KTH3094

ITEM 64552/64832/64980/64545 shown

62578686

LIMIT 2 - Coupon valid through 6/21/20*

U.S. GENERAL SUPER COUPON

26" x 22" SINGLE BANK EXTRA DEEP CABINET

- 9800 cu. in. of storage
- 1000 lb. capacity
- Weighs 175 lbs.

~~\$299.99~~

YOUR CHOICE OF 6 COLORS
\$279.99

SAVE \$1,470

COMPARE TO SNAP-ON \$1,750

MODEL: KRA4008FPB0



62581582

LIMIT 1 - Coupon valid through 6/21/20*



Item 64434, 56106, 56105, 56104, 64432, 64162,

Customer Rating
★★★★★

SUPER COUPON

200 LUMEN LED SUPER BRIGHT FLIP LIGHT

- Wireless, tool-free and easy installation

Customer Rating
★★★★★

~~\$3.99~~

NOW \$1.99

COMPARE TO PREMIER \$4.99

SAVE 60%

MODEL: SW-SWITCH-12/24

ITEM 64189/64723/63922 shown



62582028

LIMIT 4 - Coupon valid through 6/21/20*

Bauer SUPER COUPON

6 GALLON, 4 PEAK HP WET/DRY VACUUM

~~\$54.99~~
NOW \$44.99

Customer Rating
★★★★★

NEW

COMPARE TO DEWALT \$76.63

SAVE 41%

MODEL: DUXV6P

ITEM 56201



62582808

LIMIT 1 - Coupon valid through 6/21/20*



CENTRAL MACHINERY SUPER COUPON

10", 12 SPEED BENCHTOP DRILL PRESS

Customer Rating
★★★★★

~~\$139.99~~

NOW \$99.99

SAVE \$61

COMPARE TO WEN \$161.97

MODEL: 4212

ITEM 63471/44836/60237 shown



62584012

LIMIT 1 - Coupon valid through 6/21/20*



drill master SUPER COUPON

1/4" SHEET ORBITAL PALM SANDER

Customer Rating
★★★★★

~~\$14.99~~

NOW \$9.99

SAVE 66%

COMPARE TO BLACK+DECKER \$29.98

MODEL: BDEQS300

ITEM 40070

61509/61311 shown



62584467

LIMIT 4 - Coupon valid through 6/21/20*



CENTRAL PNEUMATIC SUPER COUPON

3 GALLON, 100 PSI OIL-FREE AIR COMPRESSORS

Customer Rating
★★★★★

~~\$54.99~~

NOW \$39.99

SAVE 59%

COMPARE TO PORTER-CABLE \$98.82

MODEL: PCFP02003

ITEM 69269

97080 shown



62585150

LIMIT 2 - Coupon valid through 6/21/20*

Air delivery: 0.6 CFM @ 90 PSI

ITEM 61615/60637

95275 shown

Customer Rating
★★★★★

~~\$54.99~~

NOW \$39.99

COMPARE TO PORTER-CABLE \$98.82

MODEL: PCFP02003

ITEM 69269

97080 shown

Customer Rating
★★★★★

~~\$54.99~~

NOW \$39.99

COMPARE TO PORTER-CABLE \$98.82

MODEL: PCFP02003

ITEM 69269

97080 shown

Customer Rating
★★★★★

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NOW \$39.99

COMPARE TO PORTER-CABLE \$98.82

MODEL: PCFP02003

ITEM 69269

97080 shown

Customer Rating
★★★★★

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NOW \$39.99

COMPARE TO PORTER-CABLE \$98.82

MODEL: PCFP02003

ITEM 69269

97080 shown

Customer Rating
★★★★★

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NOW \$39.99

COMPARE TO PORTER-CABLE \$98.82

MODEL: PCFP02003

ITEM 69269

97080 shown

Customer Rating
★★★★★

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NOW \$39.99

COMPARE TO PORTER-CABLE \$98.82

MODEL: PCFP02003

ITEM 69269

97080 shown

Customer Rating
★★★★★

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NOW \$39.99

COMPARE TO PORTER-CABLE \$98.82

MODEL: PCFP02003

ITEM 69269

97080 shown

Customer Rating
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COMPARE TO PORTER-CABLE \$98.82

MODEL: PCFP02003

ITEM 69269

97080 shown

Customer Rating
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COMPARE TO PORTER-CABLE \$98.82

MODEL: PCFP02003

ITEM 69269

97080 shown

Customer Rating
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NOW \$39.99

COMPARE TO PORTER-CABLE \$98.82

MODEL: PCFP02003

ITEM 69269

97080 shown

Customer Rating
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~~\$54.99~~

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COMPARE TO PORTER-CABLE \$98.82

MODEL: PCFP02003

ITEM 69269

97080 shown

Customer Rating
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COMPARE TO PORTER-CABLE \$98.82

MODEL: PCFP02003

ITEM 69269

97080 shown

Customer Rating
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COMPARE TO PORTER-CABLE \$98.82

MODEL: PCFP02003

ITEM 69269

97080 shown

Customer Rating
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COMPARE TO PORTER-CABLE \$98.82

MODEL: PCFP02003

ITEM 69269

97080 shown

Customer Rating
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NOW \$39.99

COMPARE TO PORTER-CABLE \$98.82

MODEL: PCFP02003

ITEM 69269

97080 shown

Customer Rating
★★★★★

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NOW \$39.99

COMPARE TO PORTER-CABLE \$98.82

MODEL: PCFP02003

ITEM 69269

97080 shown

Customer Rating
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COMPARE TO PORTER-CABLE \$98.82

MODEL: PCFP02003

ITEM 69269

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MODEL: PCFP02003

ITEM 69269

97080 shown

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MODEL: PCFP02003

ITEM 69269

97080 shown

Customer Rating
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COMPARE TO PORTER-CABLE \$98.82

MODEL: PCFP02003

ITEM 69269

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Customer Rating
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COMPARE TO PORTER-CABLE \$98.82

MODEL: PCFP02003

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ITEM 69269

97080 shown

Customer Rating
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MODEL: PCFP02003

ITEM 69269

97080 shown

Customer Rating
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~~\$54.99~~

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COMPARE TO PORTER-CABLE \$98.82

MODEL: PCFP02003

ITEM 69269

97080 shown

Customer Rating
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~~\$54.99~~

NOW \$39.99

COMPARE TO PORTER-CABLE \$98.82

MODEL: PCFP02003

ITEM 69269

97080 shown

Customer Rating
★★★★★

~~\$54.99~~

NOW \$39.99</

PREDATOR. BEATS HONDA*

2000 WATT SUPER QUIET INVERTER GENERATOR

Customer Rating ★★★★★

	PREDATOR	HONDA
4.7 HRS.	3.4 HRS.	
2000	MAX. STARTING WATTS	2000
1600	RUNNING WATTS	1600
61 dB	NOISE LEVEL	59 dB
48 LBS.	WEIGHT	45.6 LBS.
1.2 GAL.	TANK SIZE	.95 GAL.
3	OUTLETS	3
YES	OVERLOAD PROTECTION	YES
79.7 cc	ENGINE SIZE	98.5 cc
YES	LOW OIL ALERT	YES
YES	PARALLEL CAPABLE	YES
YES	POWER SAVER	YES

PREDATOR 2000 **NOW \$449.99** **SAVE \$559** **ITEM 62523**

HONDA EU2000i **PRICE \$1,009**

*HONDA EU2000i stated specs

LIMIT 1 - Coupon valid through 6/21/20*

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

Customer Rating ★★★★★

NOW \$299 **SAVE \$400**

COMPARE TO **BLUE HAWK** MODEL: B68X10-Y **\$878** **SAVE 65%**

ITEM 69115/69121/69129/69137/69249/877 shown

62599887

LIMIT 4 - Coupon valid through 6/21/20*

KRAUSE & BECKER **AIRLESS PAINT SPRAYER KIT**

Customer Rating ★★★★★

NOW \$164.99 **SAVE \$219.99**

COMPARE TO **GRACO** MODEL: 262800 **\$299** **SAVE \$134**

ITEM 62915/60600 shown

62599918

LIMIT 1 - Coupon valid through 6/21/20*

drillmaster **80 PIECE ROTARY TOOL KIT**

Customer Rating ★★★★★

SAVE 69% **NOW \$6.99** **COMPARE TO PROFESSIONAL WOODWORKER** MODEL: 51832 **\$22.76** **SAVE \$15.77**

ITEM 63235/63292/97626 shown

62599943

LIMIT 4 - Coupon valid through 6/21/20*

WINDSOR DESIGN **DOVETAIL JIG**

Customer Rating ★★★★★

NOW \$27.99 **SAVE 40%**

COMPARE TO **GENERAL TOOLS** MODEL: 961 **\$47.16** **SAVE \$19.17**

ITEM 34102

62600184

LIMIT 3 - Coupon valid through 6/21/20*

CHICAGO ELECTRIC POWER TOOLS **10", 15AMP BENCHTOP TABLE SAW**

Customer Rating ★★★★★

NOW \$114.99 **SAVE \$114**

COMPARE TO **RYOBI** MODEL: RTS22 **\$229** **SAVE \$114**

ITEM 45804/63117/64459/63118 shown

62600229

LIMIT 1 - Coupon valid through 6/21/20*

VOYAGER **12" TOOL BAG WITH 21 POCKETS**

Customer Rating ★★★★★

SAVE 75% **NOW \$4.99** **COMPARE TO AWP** MODEL: 3L-2216 **\$19.98** **SAVE \$15.00**

ITEM 38168/62163/62349/61467 shown

62601464

LIMIT 4 - Coupon valid through 6/21/20*

PITTSBURGH **CLICK-TYPE TORQUE WRENCHES**

Customer Rating ★★★★★

LIFETIME WARRANTY • Reversible

DRIVE	ITEM
1/4"	61277/63881/2696
3/8"	61276/63880/807
1/2"	62431/63882/239

Item 239 shown

YOUR CHOICE \$9.99 **COMPARE TO HUSKY** MODEL: K20TWA **\$88.97** **SAVE 88%** **\$19.99**

62603627

LIMIT 4 - Coupon valid through 6/21/20*

PORTLAND **1750 PSI ELECTRIC PRESSURE WASHER**

• 1.3 GPM
• Adjustable spray nozzle

NOW \$79.99 **COMPARE TO BRIGGS & STRATTON** MODEL: 20600 **\$174.44** **SAVE \$94**

ITEM 63255/63254 shown

62604123

LIMIT 2 - Coupon valid through 6/21/20*

CHICAGO ELECTRIC POWER TOOLS **6AMP VARIABLE SPEED RECIPROCATING SAW**

Customer Rating ★★★★★

NOW \$19.99 **COMPARE TO PORTER-CABLE** MODEL: PCE360 **\$59.98** **SAVE 66%** **\$20.99**

ITEM 65570/61884/62370 shown

62604293

LIMIT 4 - Coupon valid through 6/21/20*

luminar OUTDOOR **24 FT., 18 BULB, 12 SOCKET OUTDOOR LINKABLE STRING LIGHTS**

Customer Rating ★★★★★

YOUR CHOICE OF COLOR \$21.99 **SAVE 44%**

LINK UP TO 9 STRINGS

BLACK WHITE

ITEM 64486 ITEM 64739

63483 shown

COMPARE TO **PORTFOLIO** MODEL: SLC12BK **\$39.98**

62604486

LIMIT 2 - Coupon valid through 6/21/20*

PITTSBURGH **6" DIGITAL CALIPER**

Includes two 1.5v SR44 button cell batteries.

Customer Rating ★★★★★

SAE AND METRIC

NOW \$9.99 **COMPARE TO HUSKY** MODEL: 1467H **\$29.97** **SAVE 66%**

ITEM 63711/61585/62387/47257 shown

62604931

LIMIT 4 - Coupon valid through 6/21/20*

FRANKLIN **HEAVY DUTY PORTABLE SCAFFOLD**

Customer Rating ★★★★★

NOW \$169.99 **COMPARE TO BAKER** MODEL: 1-CISCNB **\$260.40** **SAVE \$90**

ITEM 63051/63050 shown

62606068

LIMIT 2 - Coupon valid through 6/21/20*

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

Customer Rating ★★★★★

• 400 lb. working load

NOW \$6.99 **COMPARE TO KEEPER** MODEL: 5505 **\$22.80** **SAVE 69%**

ITEM 90984/63056/63057/63150/56668/63094 shown

62606632

LIMIT 4 - Coupon valid through 6/21/20*

FRANKLIN **17 FT. TYPE IA MULTI-TASK LADDER**

Customer Rating ★★★★★

• Versatile - 24 configurations
• Safe + Secure + Stable
• Super Strong - Holds 300 lbs.
• Weighs 34 lbs.

NOW \$109.99 **COMPARE TO LITTLE GIANT** MODEL: XE M17 **\$298.99** **SAVE \$189**

ITEM 63419/67646/62514/63418/63417 shown

62607422

LIMIT 1 - Coupon valid through 6/21/20*

BADLAND **2500 LB. ELECTRIC WINCH WITH WIRELESS REMOTE CONTROL**

Customer Rating ★★★★★

• Weighs 14.3 lbs.
• 11-1/8" L x 4-1/2" H

SAVE \$140 **NOW \$49.99** **COMPARE TO SUPERWINCH** MODEL: 1125220 **\$189.99** **SAVE \$139.99**

ITEM 61258/61297/63476/61840 shown

62608816

LIMIT 3 - Coupon valid through 6/21/20*

7" BENCH BRUSH

Customer Rating ★★★★★

• Perfect for workshop, home or car

NOW \$1.49 **COMPARE TO TOUGH GUY** MODEL: 1A849 **\$16.36** **SAVE 90%**

ITEM 62617/1072 shown

62608845

LIMIT 4 - Coupon valid through 6/21/20*

COVERPRO **10 FT. x 20 FT. PORTABLE CAR CANOPY**

Customer Rating ★★★★★

NOW \$99.99 **SAVE \$99**

COMPARE TO **SHELTER LOGIC** MODEL: 23522 **\$199** **SAVE \$99**

ITEM 63054/62858 shown

62609523

LIMIT 1 - Coupon valid through 6/21/20*

CENTRAL MACHINERY **FOLDABLE SAWHORSE**

Customer Rating ★★★★★

NOW \$8.99 **SAVE 50%**

COMPARE TO **STANLEY** MODEL: STST11200 **\$17.99** **SAVE \$9.00**

ITEM 60710/61979 shown

62609661

LIMIT 4 - Coupon valid through 6/21/20*

*Original coupon only. No use on prior purchases after 30 days from original purchase or without original receipt. Valid through 6/21/20.

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



MODERN PERGOLA, p. 30
Like a traditional pergola, it shades the patio. But the slatted walls also provide privacy—without making you feel hemmed in.

LAZY DAY LOUNGER, p. 46
Incredibly comfortable and easy to build, it's also practical with its huge, easy-access storage drawer.

CONTEMPORARY PATIO, p. 38
We got the trendy look of oversize porcelain pavers minus the oversize price tag.



HOVER YOUR CAMERA HERE
It looks even better in video! Get a tour of our backyard escape, hosted by the builder and homeowners.

PHOTOS: TINA SARGEANT



backyard ESCAPE

**ALL-IN-ONE
GRILL STATION, p. 54**
Designed for style and convenience, this super-sturdy console will support the heaviest grill and last a lifetime.



MEET THE HOMEOWNERS

When Sara and Robert Stelfox bought their new home, the entire backyard was a blank space, a big, flat rectangle of grass. Anyone would have called it bland, but to Sara, Robert and the *Family Handyman* editors, it was also a perfect opportunity. After hours of sketching, debating and refining plans, we selected the projects shown in this issue.

Sara's favorite feature is the roomy lounge. Tucked into a corner, it's a private getaway where she can relax with a book. For Robert, the pergola has transformed the backyard the most. It blocks the Florida sun but allows a cooling breeze to flow through. For details on these projects and more, check out the following pages.



PERGOLA PARADISE

Shade and privacy
with a modern twist

By Mike Berner

Create an escape in your own backyard by building this beautiful pergola. The horizontal slats block the sun and harsh wind while keeping the space open enough for you to enjoy a breeze. It's the perfect spot to enjoy your morning coffee or wind down after work.

The angled rafters nicely complement the ceiling slats and eliminate the need for bracing. This pergola may look big and complex, but only a few details separate it from a traditional pergola. Once the posts are placed, the rest is easy.

WHAT IT TAKES

TIME	COST	SKILL LEVEL
4 days	\$2,000 to \$4,000	Intermediate

TOOLS & MATERIALS

Standard carpentry tools, drill/driver, circular saw, angle grinder, 15-gauge nailer

PLANNING AND BUILDING TIPS

- We built this pergola in Florida, where building codes are strict about hurricane-proofing. Really strict. We spent more than \$3,000 on specialty hardware, engineered drawings and permits. Chances are, your local codes will allow you to skip some of these costly steps. You could downsize the beam to a double 2x8, opt for smaller, 4x4 posts and use bolt-down post bases rather than bases that are set in the concrete (**Photo 2**). Check with your local building inspector.
- This pergola was part of a project that included a new patio. If you already have a concrete patio, set the posts right on top. Again, check with your local inspector.
- Only two posts are needed to hold up the beam. You can position the other three for less privacy or more, or eliminate them.
- This pergola is built from treated lumber and cedar. Cedar drives up the cost substantially. Using treated slats and fascia will save you about \$800.
- The diagonal rafters are supported by 45-degree joist hangers. If your local building code requires hangers, note that you'll need both left and right versions. If not, skip them and save \$400.
- I nailed the joist hangers to the ledger before installing rafters. This made installing the rafters a major hassle. It would be better to tack the rafters into place and then add the hangers.
- The house we built the pergola onto had concrete walls. Attaching the ledger board required drilling into the concrete and \$80 worth of wedge anchors, as well as extra labor.

Figure A
Modern Pergola

Overall dimensions:
19' 10" W x 9' 11" D x 8' 6" H

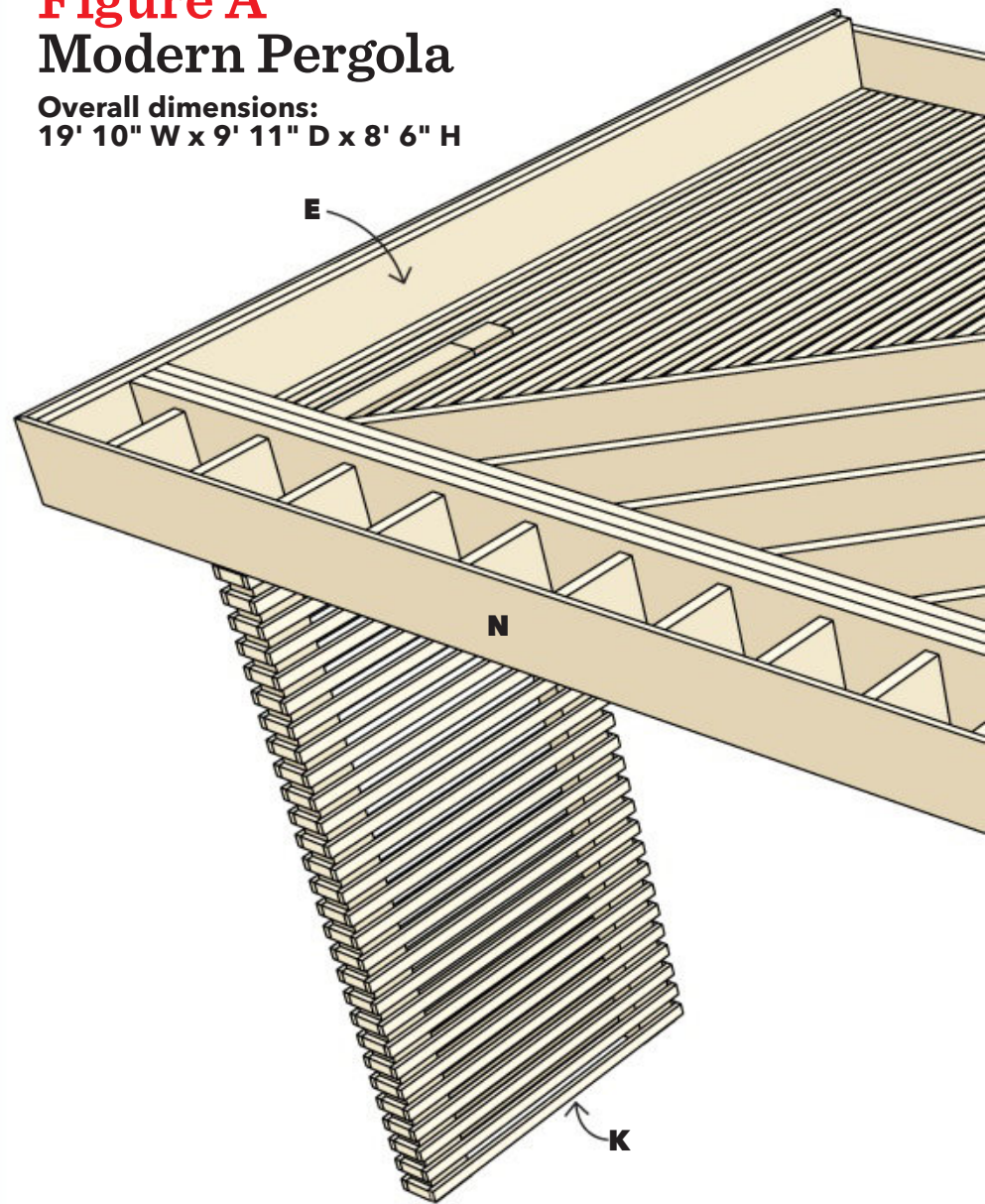
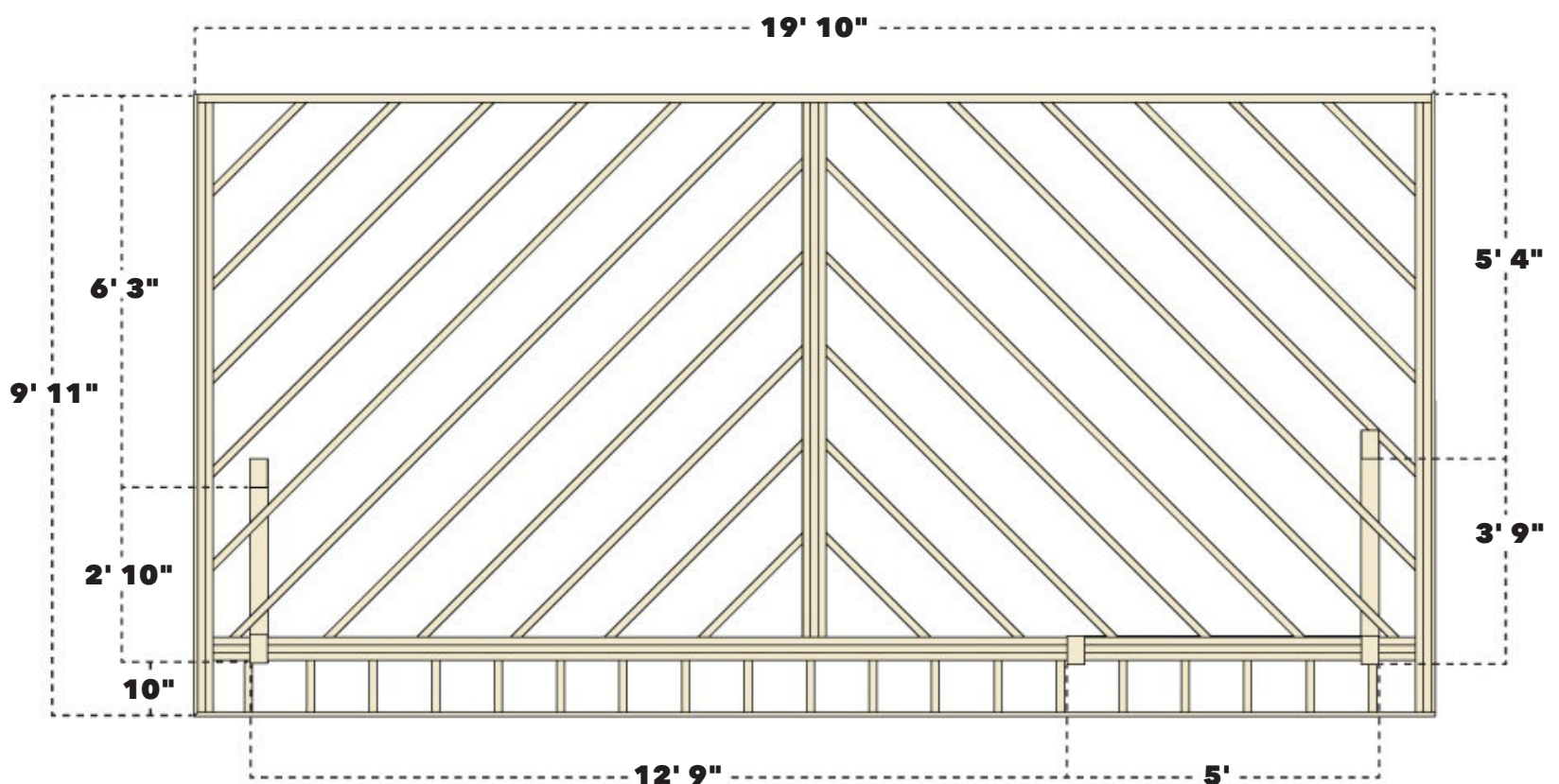
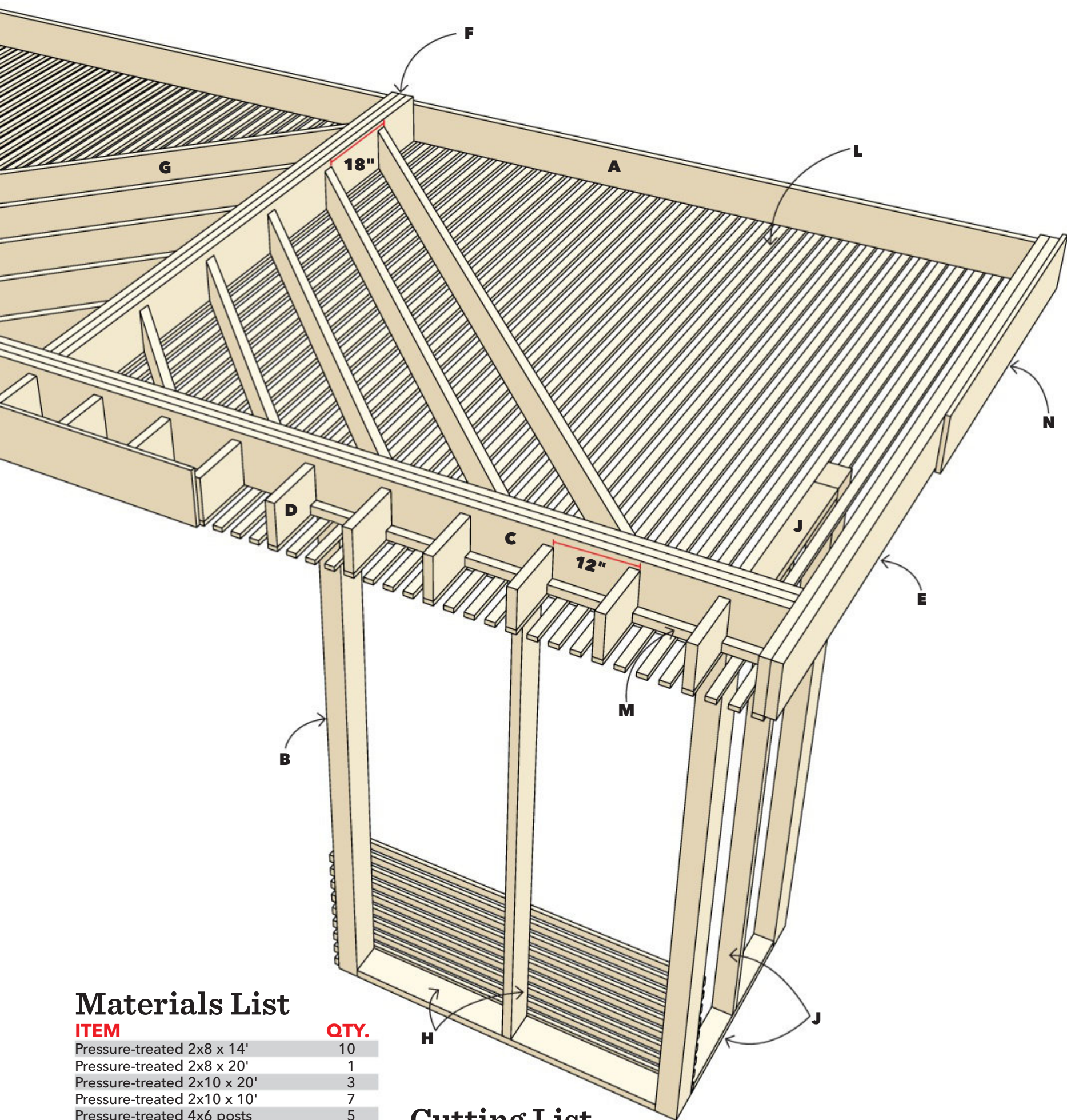


Figure B
Pergola Layout





Materials List

ITEM	QTY.
Pressure-treated 2x8 x 14'	10
Pressure-treated 2x8 x 20'	1
Pressure-treated 2x10 x 20'	3
Pressure-treated 2x10 x 10'	7
Pressure-treated 4x6 posts	5
Pressure-treated 2x4 x 8'	5
Pressure-treated 2x6 x 8'	3
Skewed hangers (left)	22
Skewed hangers (right)	22
Post bases	5
Double 2x8 concealed hangers	2
Triple 2x8 hangers	2
2x8 joist hangers	19
90-degree framing angle	4
Cedar 1x2 x 8'	31
Cedar 1x2 x 10'	142
Cedar 1x12 x 16'	4
Wedge anchors	15
Hanger nails, stainless steel	
15-gauge nails and construction screws	

Cutting List

KEY	PART
A	2x8 ledger board
B	4x6 post
C	3-ply 2x10 main beam
D	2x8 fascia blocks
E	2-ply 2x10 side beam
F	3-ply 2x10 center beam
G	2x8 angled rafters
H	2x6 wall frame
J	2x4 wall frame
K	1x2 horizontal cedar cladding
L	1x2 ceiling cedar cladding
M	Cladding nailer
N	1x10 cedar fascia



1 LAY OUT THE POST LOCATIONS

Determining the post locations is the fussiest part of this project. I drove two stakes 109 in. from the house, stretched a string between them. Then I adjusted the stakes until the string was exactly parallel with the house.



2 PLACE POST BASES

When the concrete was firm enough to hold the post brackets, I used the string and the edges of the concrete to position them and pushed them in with short up-and-down motions.

3 FASTEN THE LEDGER

This house is built from concrete blocks, so we had to drill holes in the concrete, pound in wedge anchors and tighten them up to secure the ledger board. For wood-frame homes, lag screws will do the trick. I propped the ledger in position with 2x4s.



AVOID HANGER TROUBLE

On a traditional pergola, the joists are perpendicular to the house, and it's best to attach the hangers before installing the ledger board. I tried that with the skewed hangers on this pergola, but fitting the rafters into them became a big challenge.

Instead, attach the center and side beam hangers and mark where the rafters should go, then screw the rafters into place and slide the hangers in after. To get that cool symmetrical look, be sure the rafter marks are symmetrical on the ledger board.



4 STAND THE POSTS

Cut the posts to ceiling height. Because this patio was level, I was able to get an accurate measurement from the patio to the bottom of the ledger board. When the posts are level in both directions, add bolts or screws.

5 CUT OFF THE BOLTS

If your post bases require bolts, cut them flush with the nuts. A reciprocating saw will do the job, but an angle grinder and cutoff wheel are much faster.

6 INSTALL THE MAIN BEAM

At 20 ft. long, the triple 2x10 beam would have been way too heavy to lift onto the posts, so we built the beam in place. I screwed a scrap of 2x4 to the back of the column and then glued and nailed the 2x10s together. The outer board needed hangers and blocks to hold the fascia. I attached those before we lifted the board into place.





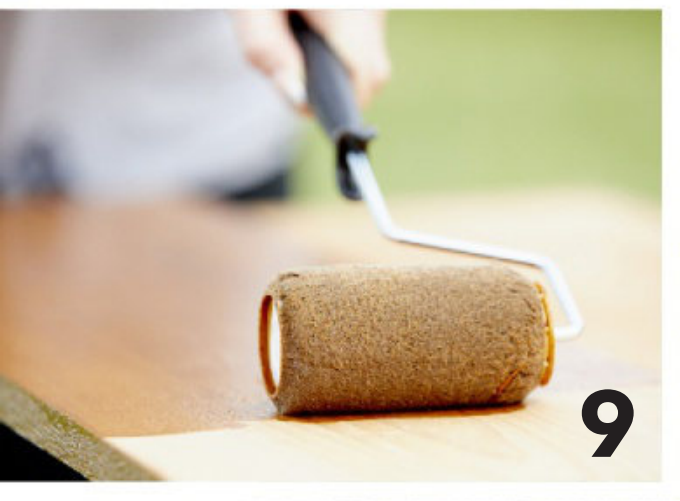
7 ATTACH THE SIDE BEAMS

Check that the columns are still plumb and attach the side beams. Slide each side beam into its hanger on the ledger board, then screw it to the side of the main beam and reinforce them with 90-degree framing angles. We ran the beams long, then trimmed them to line up with the blocks. Check that the structure is square by taking diagonal measurements at opposite corners. If the measurements aren't equal, reposition the main beam on the posts until they are.



8 HANG THE RAFTERS

Cut each rafter to length, making a 45-degree bevel on each end. As you install the rafters, be sure they're all parallel. Mirror the rafter pattern on the other side by lining up the rafters at the center beam. Then go back and install the skewed hangers.



9 PREFINISH THE SLATS AND FASCIA

To save time and get better results, stain the slats before installation. I applied a generous layer of Cabot Australian Timber Oil with a roller, then smoothed it out with a brush.



PRO TIP: Galvanized nails are notorious for leaving streaks in cedar, so I used 15-gauge stainless steel nails.

10 NAIL ON THE SLATS

Level the bottom slat about 2 in. off the patio and nail it into place. I spaced the rest of the slats 1-1/2 in. apart, using two spacers that I cut and marked with an "X." For consistency, I used the same ones throughout. Stop every few rows and check the measurement from the ceiling on both ends of the slat to make sure it's level. Use the same spacers for the ceiling slats.

11 ADD THE FASCIA

Wrap the exposed blocks and beams with fascia boards. The front of the pergola requires two pieces; cut the two boards so the seam lands in the middle of a block. Flush the fascia board to the bottom of the ceiling slats and nail it on. Cover the sides in one piece. Touch up the cut ends of the slats with stain, then start enjoying the shade!



WHAT'S WITH THE DIAGONAL RAFTERS?

I worried that this whole structure would easily sway from side to side. To prevent this "racking," I considered adding diagonal bracing to the posts or above the rafters. But either option would have just looked bad. Then the solution came to me: diagonal rafters! They add rock-solid stability and look beautiful from below.

BOTTOM: TINA SARGEANT

11



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X-Torq® • Low Vib® • Air Injection™ • SmartStart® • Quick-release air filter

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MODERN CONCRETE PATIO

High style on a low budget

By Brad Holden

When we were choosing a patio design, we came across a patio much like this one but made with big, gray porcelain pavers. We all agreed it was exactly what we wanted. Then we checked the price of porcelain—over \$5,000! We opted for concrete instead.

This design is not only stylish but also perfect for someone with limited concrete experience. It's much more forgiving than a big, continuous slab. On a large slab, a mistake in the form or in finishing can lead to depressions and water puddles. And inadequate base prep can lead to cracking. This segmented design makes those problems much less likely. To complete the look, you add decorative rock between the pavers.

Are you ready to take it on? If you have help, you can build this patio in a weekend!

WHAT IT TAKES

TIME	COST	SKILL LEVEL
2 days	\$1,000	Intermediate

TOOLS & MATERIALS

Circular saw or miter saw, drill, magnesium float, hand edging tool, hard trowel, 2x4s, 1-by stakes, sand, concrete, rebar, rebar chairs, landscape edging, decorative rock

PHOTO: TINA SARGEANT



Get expert advice on forming, pouring and finishing concrete at **familyhandyman.com**. Just search for "concrete."



Prep the site

Remove the existing sod, giving yourself a little extra room around the edges to make it easier to place the form and screed the concrete. We also dug our footings extra large for a pergola. Scrape, rake and shovel the patio area to make it as level as possible. Depending on the grade and the finished height of your patio, you may need to add some sand fill.

Lay out the patio's footprint with stakes and string. Make sure all the math works out and that the footprint is square.

1 BUILD THE FORMS

Assemble the form in sections. Stake the forms in place using 1-by stakes between the 2x4s. The stakes created a gap to get the width we wanted, and we also used them to level the forms.

2 LEVEL THE FORM

Lift and adjust the form to make it level, then screw it to the stakes. Once you're satisfied, cut the stakes flush with the top of the form.

Oops! We left the gaps open between the 2x4s, realizing too late that they'd fill with concrete. This made it difficult to remove the forms after the concrete was set. To avoid that, we recommend covering the gaps with duct tape before pouring. Also, fill in sand up to the bottom of each individual paver space, so the concrete doesn't flow underneath the form, filling the gaps from below.



3 SET AND TIE REBAR

Lay a rebar grid in each cavity, tying the intersections. Set the rebar grids on specially made "chairs" to elevate the rebar into the slabs.

4 OIL THE FORMS

Spray or brush the forms with kerosene, diesel fuel or cooking oil. This makes it easier to remove the forms after the concrete has set.

5 FILL THE FORMS

Starting in the corner closest to the house, fill each form. The easiest way to do this is to hire a pump truck. The hose is heavy, but not nearly as much work or headache as trying to run a wheelbarrow over the grid. We used fiber-reinforced concrete to ensure these slabs won't crack.

Ready-mix vs. you-mix concrete

We built forms, ordered ready-mix concrete and poured the entire patio at once. If that's too daunting, you can build one or two small form sections and pour them individually at a more leisurely pace. If you choose that route, consider buying a portable mixer and selling it when you're done.

You won't save money mixing it yourself, though. Using 80-lb. bags of mix, it'll cost you about \$200 per cu. yd. We hired a pump truck for \$180 and included fiber reinforcement in the mix, and our total price came to \$116 per cu. yd. This project took just over 4 yards, so ordering ready-mix concrete was a great deal cheaper than mixing it ourselves.





6 SCREED THE CONCRETE

Have a helper screed each section after it's filled. Our patio is large, and pouring the forms progresses quickly, so a crew of four is best to perform all the tasks before the concrete sets. The person doing the screeding should be limber, as they'll likely end up crawling around on the form grid a bit no matter how well you've planned the process.

7 "FLOAT" THE SURFACE

After the bleed water has disappeared, float each section with a magnesium float. Floating embeds coarse aggregate particles and smooths the surface without sealing it. Before our concrete set up too much, we measured for the post anchors and installed them for the pergola.

8 ROUND THE EDGES

Once the concrete begins to stiffen, it's time to start rounding over the edges of the pavers with a special edging tool. You'll need to move quickly—there's a lot of edging to be done!



10

9 TROWEL THE CONCRETE

When you're able to kneel on knee boards on the concrete and only leave a 1/8-in.- to 1/4-in.-deep indentation, start troweling the pavers. Troweling makes the surface hard, dense and smooth. Put a little "spring" in the trowel to increase that effect and feather out the transition created by the edger.

10 REMOVE THE FORMS

After the concrete has cured, back the screws out of the leveling stakes and start prying out the forms. They should come out fairly easily. If you need to use a hammer and pry bar, take care not to damage the concrete. If the forms are stubborn, run a reciprocating saw around each paver before pulling the forms.

11 FILL THE GAPS

Install landscape edging around the patio perimeter. We used Permaloc ProSlide Commercial Grade Landscape Edging (\$2 to \$5 per linear foot). Using a shovel and broom, fill the spaces between the pavers with your choice of gravel or decorative rock.

11





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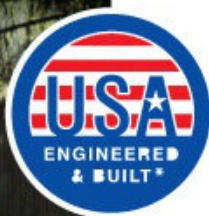
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Build it in a weekend, enjoy it for years

BY JAY CORK

Searching for patio furniture, I encountered endless chairs and benches. But I wasn't looking for just a place to sit: I wanted a comfortable spot where I could curl up with the dog and recline with a book.

When I finally found the right sofa, it was crazy-expensive (more than \$1,600!). So, I chose to build one and vowed to make it even better than the one at the store. I made it larger and more comfortable, customized it to complement the space, and even added a drawer. Best of all, this weekend project is built to last, and it's dead simple, too. If you can cut wood and drive screws, you can build it!

A custom cushion

I found a great selection of cushions for patio furniture at local home centers, but I didn't find one that worked well for this design. So I chose a local upholsterer who charged \$430 for labor and materials. Custom patio cushions are also readily available online.



BUILT-IN STORAGE
This easy-to-assemble drawer is handy for storing blankets or a few essentials for outdoor dining.

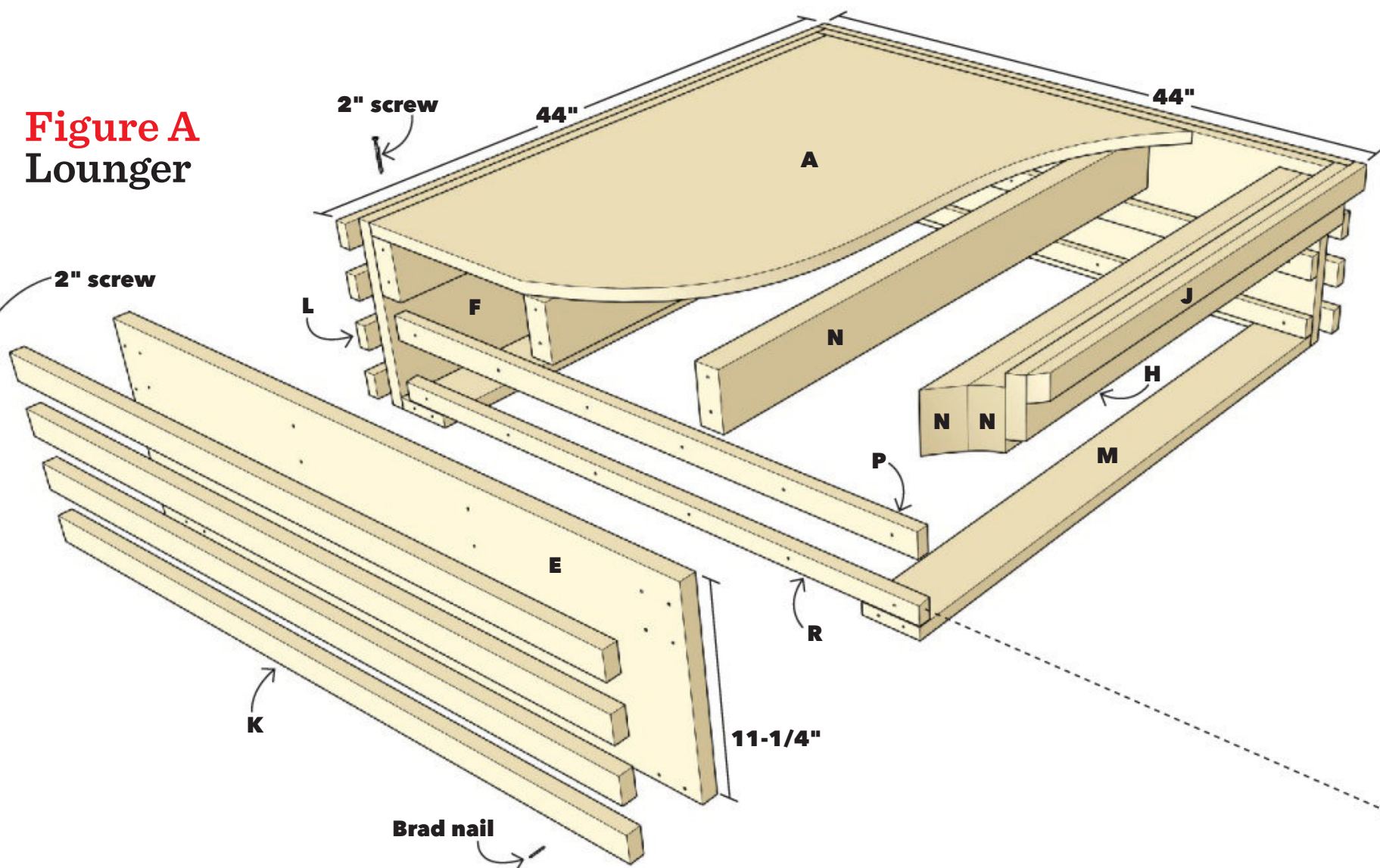
PHOTOS: TINA SARGEANT

WHAT IT TAKES

TIME	COST	SKILL LEVEL
2 days	\$400 plus the cushion	Beginner

TOOLS Table saw with combination blade, miter saw, random orbital sander or sanding block, drill driver, tape measure, caulking gun, spring clamps, brad nailer (optional)

Figure A
Lounger



Pro Tip:

To cut more parts in less time and with greater consistency, stack the pieces and use a stop block.



1 CUT THE PARTS

Cut the back and sides of the box frame (E and F). Because the back, the internal support rails and the braces (M and N) are exactly the same length, cut them all at the same time. Don't cut the front (H) to length quite yet.

2 ASSEMBLE THE BOX FRAME

Screw the sides to the back, then attach the bottom braces (M). Once these parts have been assembled, measure the width of the box frame. Cut the front (H) to that length and assemble.



Materials List

ITEM	QTY.
1x12 x 6' cedar boards	4
2x4 x 8' cedar studs	3
1x4 x 8' cedar board	1
1x2 x 8' cedar boards	8
4' x 8' x 3/4" AC plywood	1
1x6 x 36" solid oak boards	2
Quart of exterior urethane	1
Quart of stain, paint or wood finish	1
1-1/4" exterior screws	1 box
2" exterior screws	1 box
1-1/4" brad nails	1 box
Exterior caulk	
Wax	

Cutting List

KEY	QTY.	SIZE	PART	MATERIAL
A	1	3/4" x 36-3/4" x 36-3/4"	Top	3/4" plywood
B	2	3/4" x 4-1/2" x 33-1/2"	Drawer front/back	3/4" plywood
C	1	3/4" x 22-3/4" x 35"	Drawer bottom	3/4" plywood
D	2	3/4" x 4-1/2" x 22-3/4"	Drawer sides	3/4" plywood
E	2	7/8" x 11-1/4" x 37-5/8"	Sides	1x12 cedar
F	1	7/8" x 11-1/4" x 36-3/4"	Back	1x12 cedar
G	1	7/8" x 7-1/4" x 38-1/2"	Drawer face	1x12 cedar
H	1	7/8" x 3-1/2" x 38-1/2"	Front	1x12 cedar
J	4	3/4" x 1-1/2" x 40"	Front cladding	1x2 cedar
K	8	3/4" x 1-1/2" x 39-1/4"	Side cladding	1x2 cedar
L	4	3/4" x 1-1/2" x 38-1/2"	Back cladding	1x2 cedar
M	2	3/4" x 3-1/2" x 36-3/4"	Braces	1x4 cedar
N	5	1-1/2" x 3-1/2" x 36-3/4"	Top supports	2x4 cedar
P	2	3/4" x 1-1/4" x 36"	Drawer slide part 1	3/4" oak
Q	2	3/4" x 2-1/2" x 36"	Drawer slide part 2	3/4" oak
R	2	3/4" x 1-1/2" x 36"	Drawer slide part 3	3/4" oak

Figure B
Drawer

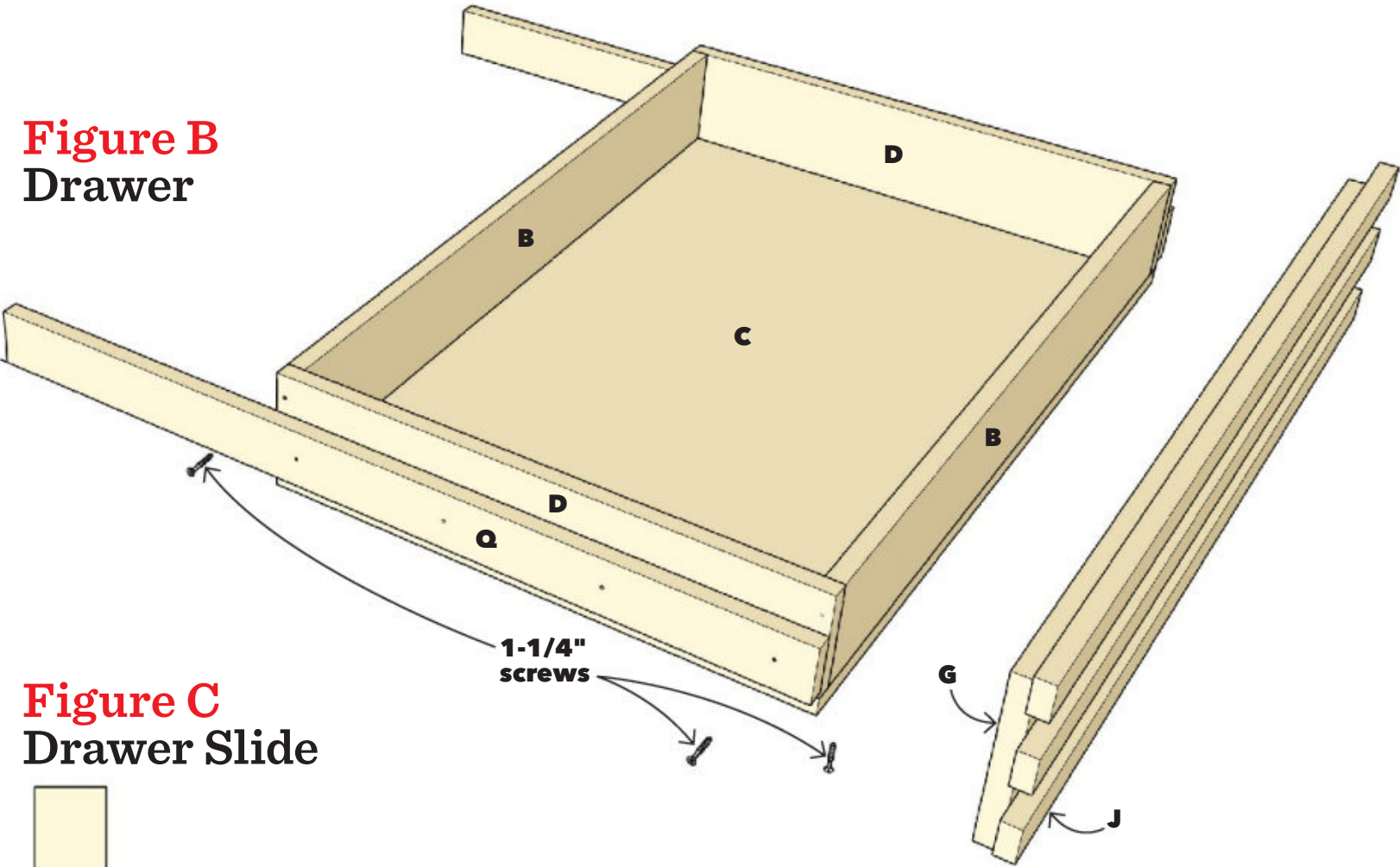


Figure C
Drawer Slide

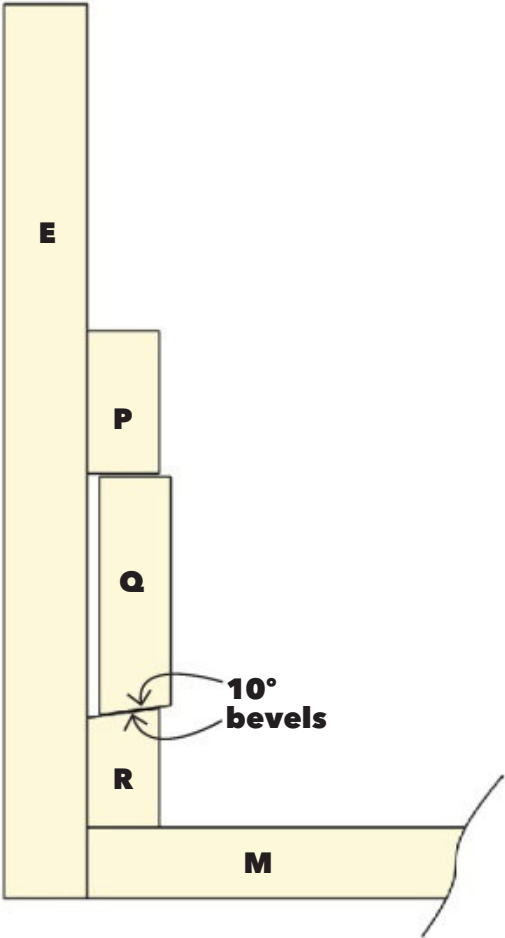
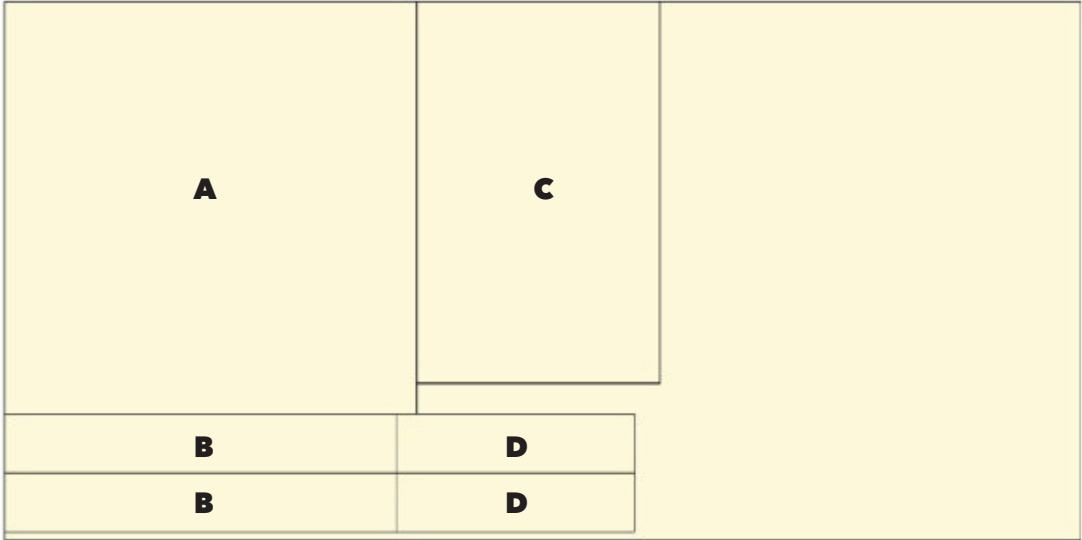


Figure D
Plywood Cutting Diagram



Time-Saving Tip: Before you cut the drawer slide parts on the table saw, seal the oak board with a coat of urethane.



3 CUT DRAWER SLIDES

Each drawer slide consists of three parts, all cut from the same board. Set the blade on the table saw to 10 degrees and the fence to 1-1/2 in. and make the first cut. Label this part P. Set the blade back to zero, the fence to 2-1/2 in. and make the second cut. This gives you parts Q and R.

4 LUBRICATE THE SLIDES

Sand the edges of the drawer slides with 320-grit sandpaper and clean off the dust. Rub wax along the beveled edges of the drawer slides; really work it into the surface of the wood. Rub off any excess with a cotton cloth. I prefer to use beeswax, but paraffin or any candle will work well too.



5 INSTALL THE DRAWER SLIDES

Start with part P, snugging it tight to the bottom braces. Be sure the bevel is angled into the side of the box frame. Predrill and screw it down. Now, place part Q snugly against part P and place a 1/8-in. spacer (Figure C) on top of it (about 10 playing cards works perfectly for this). Place part R against the spacer and screw it to the box frame. When you remove the spacer, part Q should easily slide out the front. Repeat this process on the opposite side.



6 MEASURE FOR THE DRAWER

From one of the 4 x 4-ft. pieces of plywood, rip three strips at 4-1/2 in. Cut the drawer box sides (D) to length. Measure the distance between the left- and the right-side drawer slides and subtract 1/4 in. Write this number down: it's the absolute width of the drawer box. Further subtract 1-1/2 in. and note that number. This confirms the dimensions of the front and back pieces (B) of the drawer box. Cut the pieces to length.



7



7 ASSEMBLE THE DRAWER BOX

Assemble the drawer box by screwing the sides to the front and back. Measure to confirm the exact dimensions and cut the drawer bottom to that size. Attach it with glue and screws.

8 ADD THE DRAWER BOX SLIDE

Set the box frame on its side. Insert part Q in the box frame, making it snug to part P. Now set the drawer box in the opening, ensuring there's enough space above and below, and mark where the top of part Q meets the drawer box. Transfer that line all the way down both sides of the drawer box. Place part Q to the line, front edge flush with the front of the drawer box, and screw it down.

8



9 ATTACH THE DRAWER FACE

Drive two 1-1/4-in. screws through the front of the drawer box so the tips of the screws protrude just shy of 1/4 in. Position the drawer face (G) and tap it with your fist. The screws will dig in, holding the drawer face in place. Using a spring clamp or two to help keep the drawer face from moving around, drive those screws home. Add three more screws.

9





10 ADD THE TOP SUPPORTS

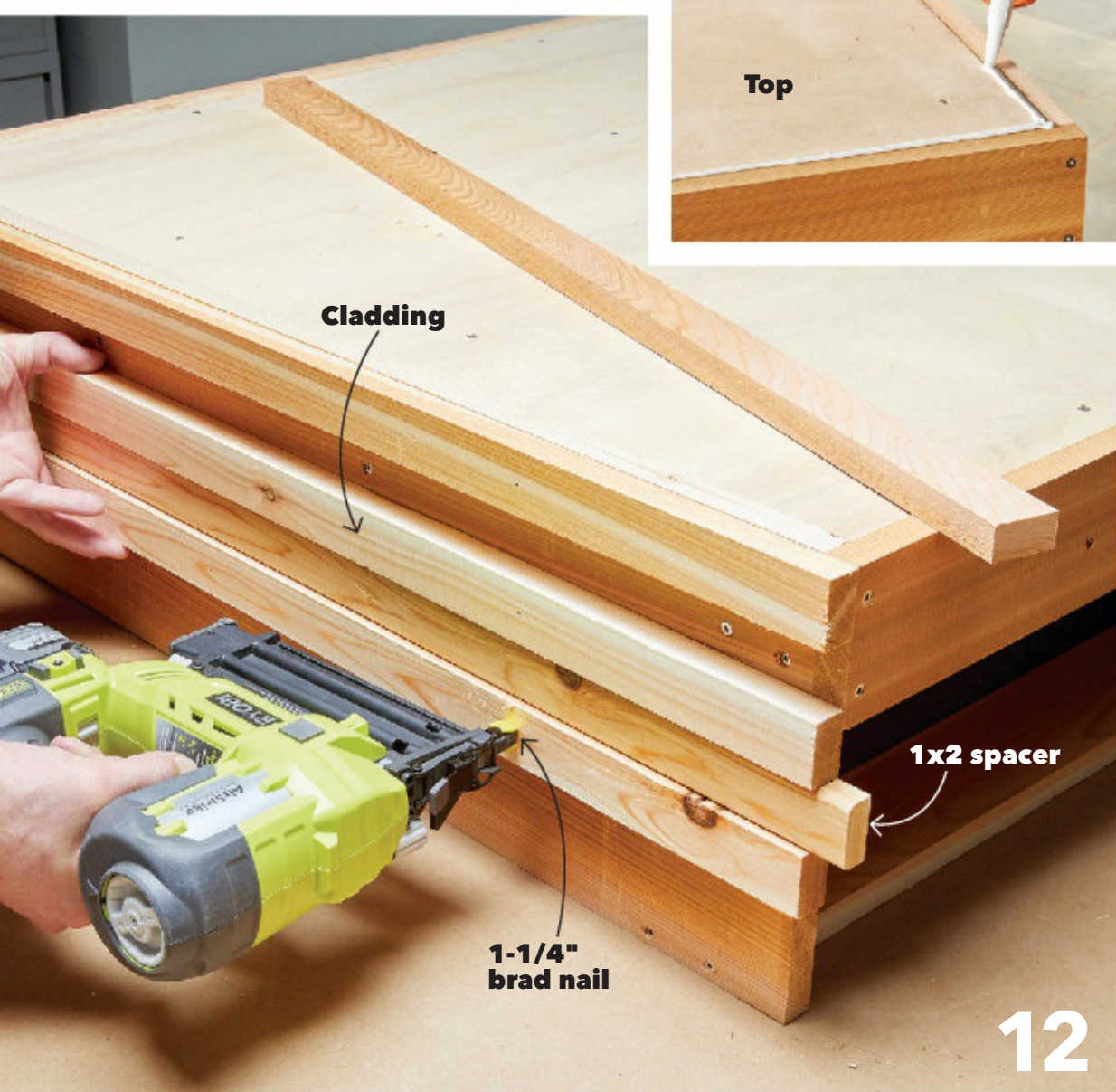
Spacing the 2x4 top supports (N) evenly, attach them with 2-in. screws. Mark their locations to help position the screws for the top.

11 INSTALL AND SEAL THE TOP

Double-check the internal measurements of the box frame and cut the top (A) from the plywood. Test-fit the top, and then screw it down to the 2x4 top supports. The sofa I built is intended for outdoor use, so I also sealed the plywood with urethane and caulked around the perimeter to help keep out moisture.

12 ADD THE CLADDING

I used 1x2 cedar strips for the cladding detail. Fasten them with exterior wood glue and brads, starting at the top and working down. Space the cladding with a scrap of 1x2 cedar. Next, double-check the measurement for the side cladding (K), cut and attach. Finally, double-check the total width, cut the front cladding (J) and attach.





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All-in-one GRILLING STATION

Build a home for your grill and put everything you need at your fingertips

BY TOM DVORAK



WHAT IT TAKES

TIME	COST	SKILL LEVEL
3 days	\$750	Intermediate

TOOLS Table saw, or circular saw with cutting guide, miter saw, drill, jigsaw

If you're like me, you spend a lot of your grilling time running back and forth. You grab the wood chips, head back to the grill, and then make a couple trips to the kitchen for your favorite seasoning, the skewers and, oh yeah, another clean plate. This handsome grilling cabinet keeps your stuff together and gives you counter space, too. I built this one over a few days and spent \$750 on lumber and hardware.

EDGE-GLUE BOARDS TO MAKE PANELS

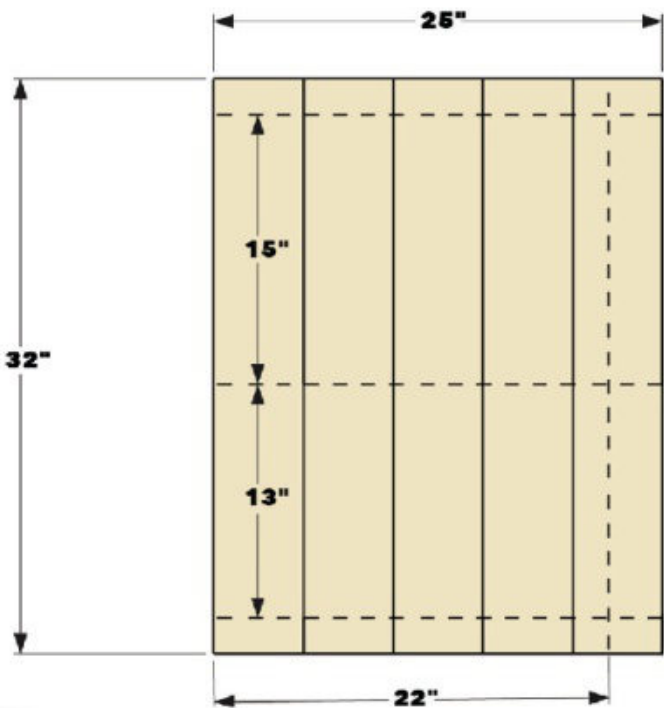
The main components of this project are made from edge-glued panels: three 25-in. x 52-in. panels for the top and shelves, and two 25-in. x 32-in. panels for the uprights. See the Cutting List for finished sizes. You'll get two uprights from each panel. Glue up the divider separately.

To get started, crosscut the 2x6s into lengths about 4 in. longer than required. You'll cut them to finished length after gluing. On a table saw, rip the radiused edges off both sides of each 2x6, leaving a finished width of 5 in. This way, you'll have square, straight edges for gluing.

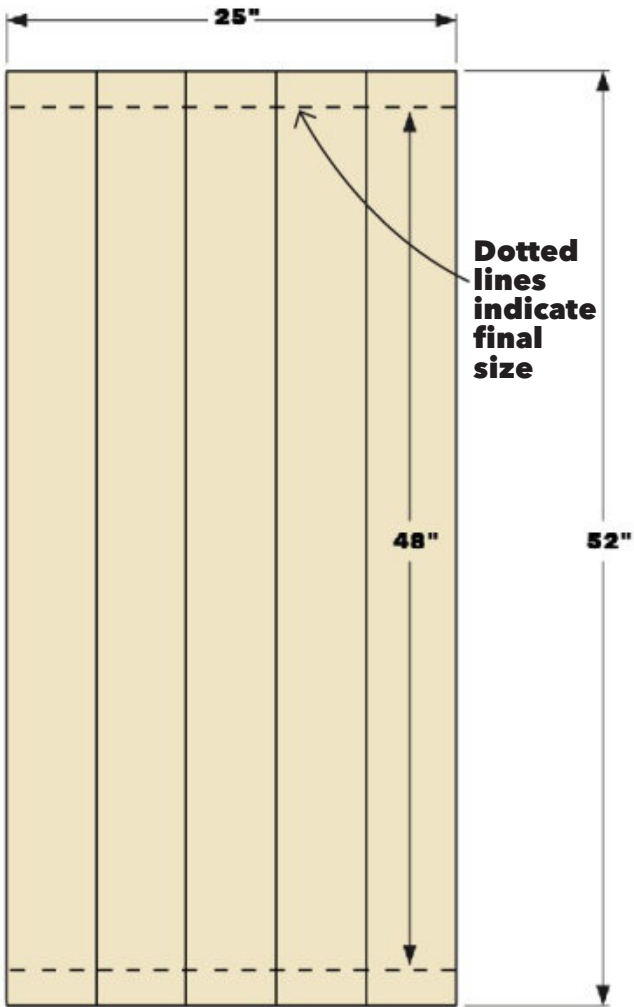
Quality lumber makes building easier and the end result better. Good-quality cedar isn't cheap, though. The lumber and materials for this project cost about \$750. Home centers don't always have the best lumber, so I found a lumberyard with an ample supply of nice cedar. After handpicking straight stock, I let the lumber acclimate in my shop for about a week. You could save money by using standard construction lumber, but it's not as resistant to the elements as cedar.



Once your boards are prepped, install biscuits. No biscuit joiner? Don't sweat it. Biscuits help with alignment, but if your boards and your workbench are flat, you don't need them.



Uprights



Shelves & Top

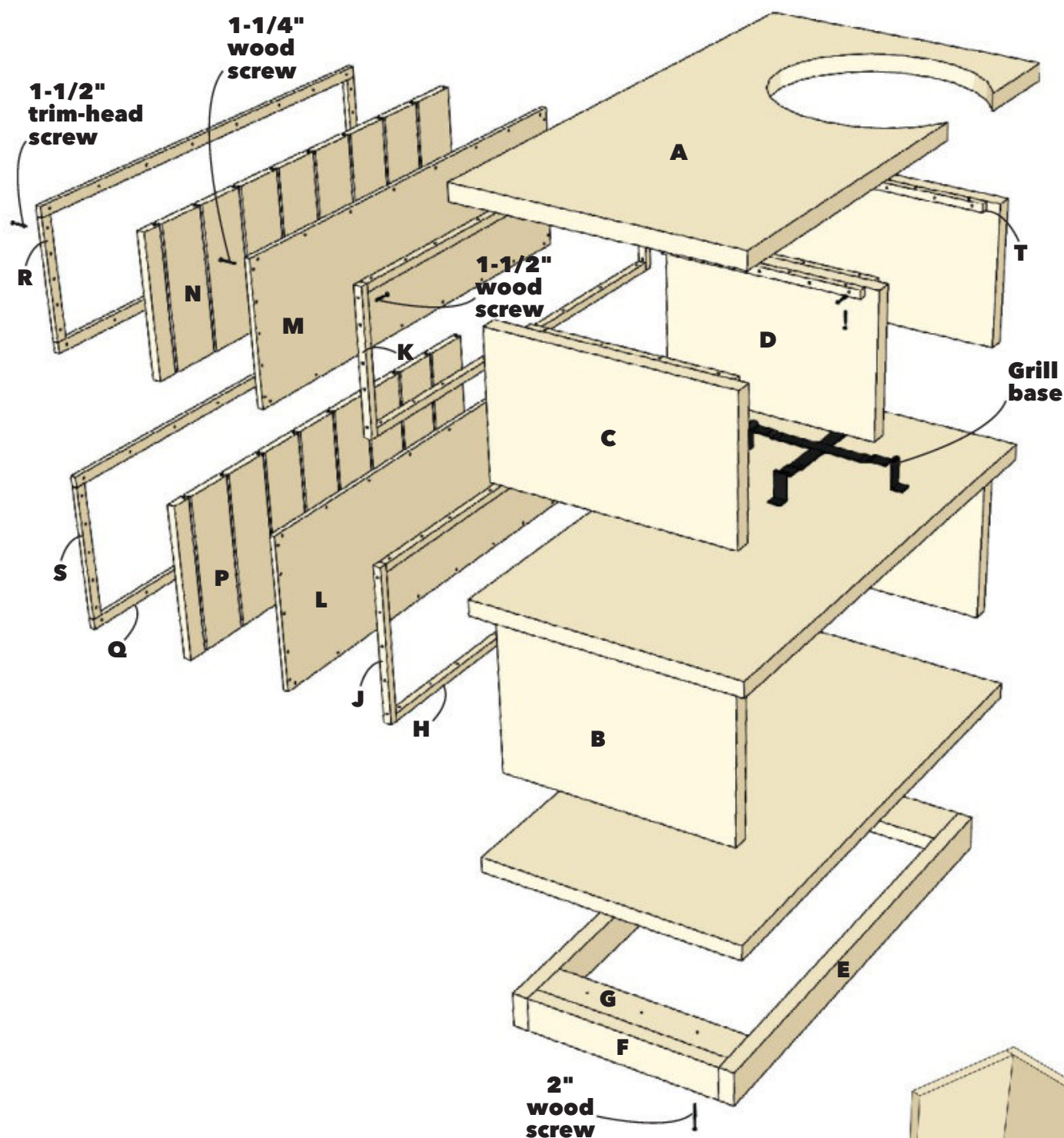
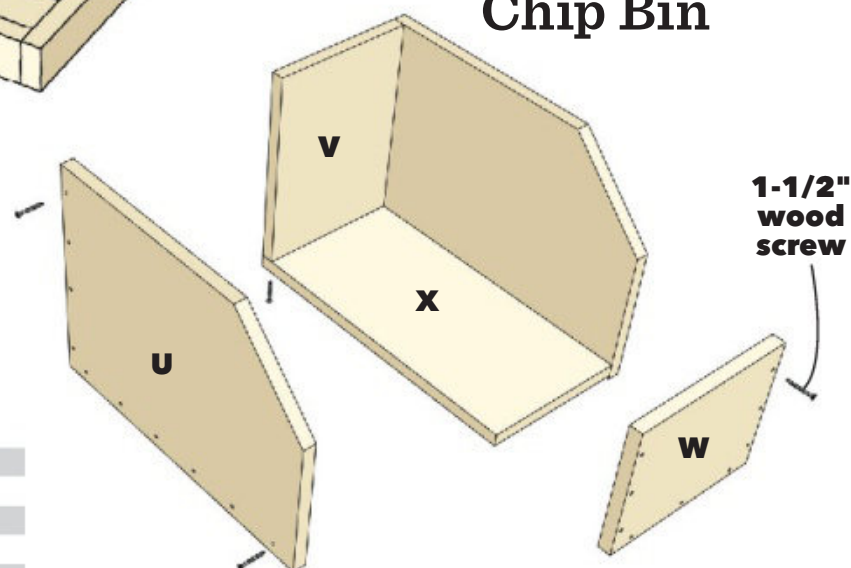


Figure A
Grilling Station

OVERALL
DIMENSIONS:
36" H x 48" W
x 25" D

**Wood
Chip Bin**



Cutting List

KEY	QTY.	SIZE	PART
A	3	1-1/2" x 25" x 48"	Shelves
B	2	1-1/2" x 22" x 15"	Bottom uprights
C	2	1-1/2" x 22" x 13"	Top uprights
D	1	1-1/2" x 19-1/4" x 13"	Divider
E	2	1-1/2" x 3-1/2" x 45"	Base front and back
F	2	1-1/2" x 3-1/2" x 19"	Base ends
G	2	1-1/2" x 3-1/2" x 19"	Base nailers
H	4	3/4" x 3/4" x 40-1/2"	Long back cleats
J	2	3/4" x 3/4" x 15"	Short back cleats (bottom)
K	2	3/4" x 3/4" x 13"	Short back cleats (top)
L	1	1/2" x 15" x 42"	Back (bottom)
M	1	1/2" x 13" x 42"	Back (top)
N	9	3/4" x 5-1/4" x 13"*	Tongue-and-groove (top)
P	9	3/4" x 5-1/4" x 15"*	Tongue-and-groove (bottom)
Q	4	1/2" x 1" x 42"	Long battens
R	2	1/2" x 1" x 11"	Short battens (top)
S	2	1/2" x 1" x 13"	Short battens (bottom)
T	5	3/4" x 3/4" x 18"	Shelf cleats
U	8	3/4" x 13" x 18"	Bin sides
V	4	3/4" x 8-1/2" x 12"	Bin backs
W	4	3/4" x 7-1/4" x 10"	Bin fronts
X	4	1/2" x 8-1/2" x 18"	Bin bottoms

*Rip parts to fit

Materials List

ITEM	QTY.
2x6 x 8' cedar	15
2x4 x 8' cedar	2
1x8 x 8' cedar	6
1x6 x 8' tongue-and-groove cedar	3
No. 20 biscuits	100
1x6 x 36" solid oak boards	2
3-1/2" deck screws	1 lb.
No. 9 x 2" exterior trim head screws	1 lb.
No. 9 x 3" exterior trim head screws	1 lb.
Exterior oil finish	1 qt.
Waterproof glue	1 qt.

1 TEST-FIT, THEN GLUE

Before you start gluing, do a dry assembly to be sure everything fits. You don't want to discover a problem when you've already spread glue on all the edges. Once you've verified that everything is ready to go, glue up the shelves and uprights and clamp them. The 2x4 clamping cauls at the top and the bottom help keep the assembly flat, but make sure to cover their edges with packing tape so they don't get glued to your workpieces. Wipe off any excess glue with a damp rag before it dries. When the glue is dry, cut the shelves and uprights to the final dimensions.



2 ADD THE CLEATS

Glue and screw cleats to the top edges of all uprights. These cleats allow you to screw into the shelves from underneath to fasten the whole unit together.

3 ATTACH THE BOTTOM UPRIGHTS

Glue and screw the two bottom uprights to the bottom shelf. These wide shelves are prone to cupping, so you might need to use clamps to snug them up to the uprights before you drive the screws.





4 ATTACH THE BASE

Flip the bottom shelf/upright assembly upside down, and then screw the assembled base to the underside of the bottom shelf.

5 FASTEN THE SHELVES AND TOP

Set the middle shelf assembly on the bottom shelf assembly and then attach it with glue and screws through the lower cleats. Fasten the top the same way. As you're assembling, check for square before driving screws.



6 ADD THE BACK

To attach the back, start by gluing and screwing cleats around the back of the openings. Inset these cleats to accept the back panel, tongue-and-groove and molding. Cut the plywood backs to size and fasten them to the cleats with glue and screws.

7 COVER THE BACK

Cut tongue-and-groove slats to fit the openings. To allow for seasonal movement, don't use fasteners on these boards.



8 ADD THE BATTENS

Rip the 1/2-in.-thick trim strips from 1-1/2-in. thick stock, and then cut them to length to fit the backs. Fasten them to the backs with 1-1/2-in. trim-head screws.

9 BUILD THE BINS

Edge-glue 3/4-in.-thick panels for the bin parts. Once the glue is dry, cut the bin parts to size. Then cut the 45-degree angles on all the bin sides. Assemble bins with glue and screws.

10 CUT THE HOLE FOR THE SMOKER

Lay out the hole in the top for the smoker. We let the circle run off the edge of the top to allow easy access to the lid's handle. Then, carefully cut out the hole using a jigsaw. Go slow to help keep the blade from veering off track. Smooth the cut edges with 120-grit sandpaper, then sand the whole project. Apply an exterior coating of your choice.



Fill the bins with your favorite wood chips. For expert advice on pairing smoke flavors with foods, see p. 60.

MEET THE EXPERT

Damon Holter is an award-winning barbecue and grilling expert.

Kamado Grilling

TIPS FROM A MASTER

■ DON'T CLEAN WITH A WIRE BRUSH

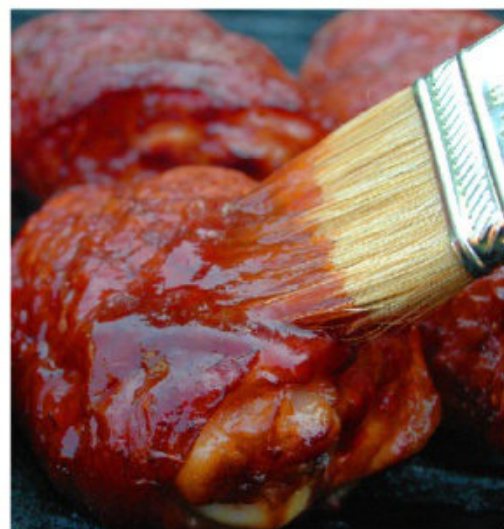
Wire brushes can lose bristles that can wind up in your food and ultimately in your body. If caught in your throat, bristles can be life-threatening. Use a wooden grill-cleaning tool or a wad of foil to brush off the debris. Cleaning the grate while it's hot makes this task easier.

■ CATCH THE GREASE

When smoking very fatty foods, such as pork butt, place a disposable foil pan under the meat to catch the rendered fat. This minimizes the grease buildup that can cause flare-ups or eventually leak out of the bottom vent, making a mess on your beautiful cart.

■ APPLY SAUCES LAST

Most barbecue sauces are high in sugar, which burns quickly under high heat. Once your food nears the desired temperature and doneness, close all vents and begin to decrease the heat. Baste meats with sauce and let the sauce "set" on them for 15 to 20 minutes as the temperature decreases. This will create an even coating of slightly caramelized sauce that will cling to the food.



■ NO CHEMICAL CLEANERS

Ceramic is porous and will harbor chemical residue that can be transferred to your food. To clean the inside of your grill, simply brush and scrape the interior surface. Warm water and dish soap will keep the exterior looking great.

WHAT'S A KAMADO GRILL?

"Kamado" is the Japanese word for "stove" or "cooking range." It's also the general term for ceramic grills. Kamado grills heat faster and retain heat longer than metal ones. They also excel at containing moisture and smoke, which increases flavor.

■ ARRANGE THE CHARCOAL

If you're using natural lump charcoal, place the larger lumps toward the bottom. That way, ash from the smaller pieces will have less opportunity to restrict airflow into the grill's fire ring, resulting in an even burn.

■ IGNITE IN THE MIDDLE

When you're igniting charcoal in a kamado, place and light a fire starter in the middle of the charcoal. With the lid and vents wide open, wait until you have a softball-sized clump of burning coals, then close the lid and begin to manage the airflow with the vents. This ensures that you don't ignite too much fuel. You want a steady burn that will slowly spread outward.

■ CHIPS VS. CHUNKS

Wood chips and chunks both work great in a kamado grill but should be treated differently. Since they're small, wood chips tend to burn too quickly. Soak them in water first to get a slower, smoky burn. Chips should be evenly distributed over the charcoal to produce a longer smoke and are ideal for adding flavor to meats that need shorter cook times, such as steaks and pork chops.

Wood chunks, on the other hand, don't need to be soaked. Place them around the outer edge of the fire bowl/ring to burn slowly as the coals spread, giving long-lasting smoke for more flavor.

■ COOK SMALL STUFF ON A SCREEN

When you're cooking foods like shrimp, wings or veggies, put them on a wire screen, such as a pizza screen. Spray the screen with cooking oil, then set the screen on the grill grates. This keeps food from falling through the grate and lets you quickly place and remove all the pieces at once.

■ CONSERVE FUEL

Kamado grills are well insulated and require much smaller amounts of charcoal. When done grilling, close off all vents to extinguish the fire and you'll be left with usable charcoal. The next time you grill, shake out the ashes, top off the charcoal and you're ready to go.

■ WOOD RECOMMENDATIONS

For lighter meats such as poultry, ribs and seafood, choose fruitwoods such as apple, peach and cherry. To smoke heartier meats such as pork butt, beef brisket and prime rib, pick a robust wood like hickory, oak or pecan.





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Quick and simple ways to get organized



Vinyl gutter tool tray

What can you do with a leftover length of gutter? You can screw it to the edge of your workbench and use it to keep tools and fasteners out of your way but handy for assembly work.

Round up small parts

Steel shower curtain holders are perfect for organizing small hardware with holes, such as saber saw blades, washers, eye screws, POP rivet parts and cotter pins.



Cordless drill hangout

Here's a way to prevent cordless drills from toppling off your workbench. Screw large vinyl-covered hooks (available for \$1 at hardware stores and home centers) to a convenient spot on a wall or exposed stud and hang up those drills for safekeeping and easy access.



Tool-apron storage

Tool aprons can be modified to store nearly any household item. Just sew a variety of pocket widths in the apron, then mount them by screwing a wood strip through the top of each and into a door. For hollow-core doors, use drywall fasteners to hold the screws firmly to the door.

Rotary bit organizer

If you avoid using your rotary tool because all the bits and accessories are a discouraging mess, here's a solution for you. Friction-fit a piece of 3/4-in. plastic foam into a snap-lid plastic food container. Then poke holes in the foam with an awl to hold shafted bits, and slice crevices with a utility knife to hold cutoff discs. Using a spade bit at high speed, drill sockets for larger bits and tube-shape containers. Then just load it up and snap it shut.





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Expert advice from the jobsite By Jason Ingolfsland

SIMPLY CLEAN

Tools, tricks and recipes for a spotless home

Schar Ward cleans the old-fashioned way—with homemade cleaning solutions, rags made from sheets, and a little elbow grease. With decades of experience, she's tackled dirt, grime and stains that aren't for the faint of heart, and she doesn't think you need fancy new products to clean. With a little knowledge, you can get the job done with many of the household cleaners you probably have lying around. Here are some of her favorite techniques to make your house shine.

PREVENT MINERAL BUILDUP WITH A SQUEEGEE

Hard water buildup means hard work later. Schar gives a squeegee to all her customers and tells them to use it after every shower. It makes cleaning showers much easier.



MEET THE EXPERT

Schar Ward has been professionally cleaning homes since 1973. She's the author of *Teaching Children to Clean* and loves to pass on her knowledge to the next generation.

Schar's Secret Weapons

Shown below are Schar's favorite commercial cleaning products—for removing stubborn mineral deposits, cleaning and protecting wood surfaces, and more. We were surprised to learn that for most cleaning tasks, she prefers to mix her own solutions. Check those out at right.

OLD ENGLISH

To clean and protect wood surfaces, Schar recommends Old English. Its nongreasy formula helps prevent water marks and stains.



PHOSPHORIC ACID CLEANER (\$12)

For stubborn mineral deposits on natural stone, porcelain, concrete and masonry, Schar says phosphoric acid cleaner is a must-have. After applying, let it sit for 10 minutes, rinse and you're done. You could use vinegar, but it takes longer.

MURPHY OIL SOAP (\$4)

Schar loves using this cleaner on wood floors, but she emphasized that you need to dry the floor afterward.

FOLEX (\$13)

Schar has seen plenty of tough carpet stains. She says Folex carpet spot remover has never failed to take out a stain. You can find it online or at home centers.

USE ERASER SPONGES ON PAINT WITH CAUTION

Eraser sponges like the Magic Eraser have their uses, but be careful on painted surfaces; they can alter the sheen of the paint. Alternatively, use a mix of Murphy Oil Soap and baking soda to clean walls.

MAKE YOUR OWN CLEANING SOLUTIONS

Instead of loading up on expensive cleaners, make your own solutions with common household products like vinegar and baking soda. Here are a few of Schar's recipes:

ALL-PURPOSE SPRAY

Fill a spray bottle with half vinegar and half water. Add 10 drops of scented oil.

WINDOW CLEANER

Pour one bottle of club soda in a spray bottle.

SCRUBBING SOLUTION

- 1-3/4 cups baking soda
- 1/2 cup water
- 1/2 cup castile soap
- A few drops of essential oil

Mix in bowl and stir until it has the consistency of frosting. Store in a pump bottle. Shake well before use. It's effective on pots and pans, sinks, bathtubs and more.

HARD-WATER BUILDUP CLEANER

- 1 tsp. borax
- 1tbsp. castile soap
- 2 tbsp. white vinegar
- 2 cups water
- 5 drops of essential oil

Mix and store in spray bottle.

CARPET FRESHENER

Fill a shaker container three-quarters full of baking soda. Add 10 drops of essential oil. Mix with a fork and sprinkle on carpet. Clean with a vacuum.

ESSENTIAL OILS

Add an essential oil to your cleaning solutions for a fresh scent.



Tips to Clean Like a Pro



DITCH THE MOP

Schar doesn't use a wet mop. She says mops do more harm, spreading dirt everywhere. Instead, she says to clean floors on your hands and knees. First vacuum, then fill a bucket three-quarters full of warm water and 1 tbsp. castile soap. Wash with a terry cloth rag in a 4-sq.-ft. section, dry and repeat, working your way out of the room.

KNEEPADS (\$5)
Inexpensive, non-marring foam cap kneepads help keep you comfortable while you wash the floor.

■ MAKE YOUR OWN RAGS

To save money, Schar makes her own rags from sheets she buys at the thrift store. Cut them to size and if you like, hem them so they don't fray. You'll have plenty of rags without paying a premium.

■ WASH YOUR RAGS TWICE

If you want a clean house, you need clean rags. Dirty rags harbor all kinds of bacteria, so wash your rags twice—once with bleach and the second time without.

■ FORGET DISPOSABLE CLOTHS

Disposable dust cloths might seem like a good idea, but use a flannel cloth with a little Old English instead. It's just as effective and you'll save money.

■ ANYTHING YOU WASH, YOU DRY

Don't wash surfaces with a cleaner and let them dry on their own; it leaves a sticky residue. Dry everything after washing.

■ LIFT OBJECTS; DON'T SLIDE

When dusting, it's easy to move objects around without thinking about how you're moving them, but Schar emphasizes you must lift them rather than sliding. Sliding scratches the finish.



RUN THE DISHWASHER WITH VINEGAR

Dishwashers need to be cleaned if you have hard water. Place a half cup of vinegar on the top rack and run it normally. Do this every few weeks.



A PUMICE STONE GETS RID OF MINERAL BUILDUP

Use a pumice stone to remove mineral deposits from toilets, sinks, tubs and oven interiors. Pumice is abrasive enough to grind off the minerals but won't scratch porcelain. Just be sure to keep the end wet. You can use it on grill and oven grates, too. Pumice stones cost about \$1.50 each at home centers and online.



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Don't get overwhelmed

Faced with a whole house to clean, you're more likely to procrastinate, get sidetracked during the job or just give up. So Schar has developed a strategy to make cleaning manageable, approachable and efficient.

■ START WITH THE DIRTIEST ROOM FIRST

Tackle the big project first and everything else will seem easy in comparison. Plus, you'll feel better when it's done.

■ WORK TOP TO BOTTOM, LEFT TO RIGHT

When staring a dirty room in the face, you may feel at a loss to know where to start. Schar recommends you work top to bottom, left to right. When you're done, do a quick once over to see if you've missed anything.

■ SET A TIME LIMIT

Instead of telling the family it's a cleaning day, set a time limit and stick to it. Cleaning isn't so bad when you say you'll do it for two hours rather than all day.



Wax paper

USE HEAVY BOOKS TO HELP REMOVE CARPET STAINS

Spray the stained area with Folex or other carpet stain cleaner, blot it with towels, being sure not to rub, and cover the towels with wax paper. Then place heavy books or other weights on top of the towels. Leave the weights in place overnight and the stain will be gone.

BOWL SWAB (\$5)

Schar uses a bowl swab to clean toilets. Standard toilet brushes don't work well for spreading toilet cleaner around the bowl—a little water rinses it right off the bristles. The swab, on the other hand, retains the cleaner and can reach underneath the rim and down the throat of the toilet bowl. Schar also uses a swab to clean tile.

RAGS

Schar uses three types of rags: cotton sheets, flannel and terry cloth. The cotton sheets are for drying windows, the flannel is for dusting, and the terry cloth is for scrubbing.



Terry cloth rags

Rags from cotton sheets

Flannel rags

Pumice stone (\$1.50)

Squeegee (\$15)

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Baffled by batteries? “Amp hours” is the key

Cordless power used to be easy to figure out—voltage was everything. But with lithium-ion (Li-ion) technology, most full-size tools use an 18-volt battery, usually comprising five individual cells of 3.6 volts ($5 \times 3.6 = 18$). This five-cell stack has become the sweet spot for power, run-time and battery weight/size. Improvements in the tools, such as the addition of brushless motors, also help batteries run longer.

More important than voltage is the battery's amp-hour (Ah) rating, which tells you how long the battery will work effectively. For a battery rated at 2.0 Ah, you can draw 2 amps for 1 hour or 1 amp for 2 hours. Theoretically, anyway. The actual run-time also depends on the task, the battery's charge level and the temperature.

Most single-stack 18-volt batteries offer 1.5 to 3.0 Ah. High-performance batteries, stuffed with more and/or higher-capacity cells, can reach 5.0 to 9.0 Ah. These are typically for powering chain saws, compound miter saws and reciprocating saws. Some high-demand tools use two 18-volt batteries to boost the power to 36 volts.



ELECTRICAL CODE CHANGES: WHAT DIYers NEED TO KNOW

The National Electrical Code is revised every three years, and the 2020 code includes the following revisions that may affect DIYers.

A. GFCI protection is required almost anywhere current is drawn outdoors, including receptacles and AC condensing units. The only exception is lighting outlets.

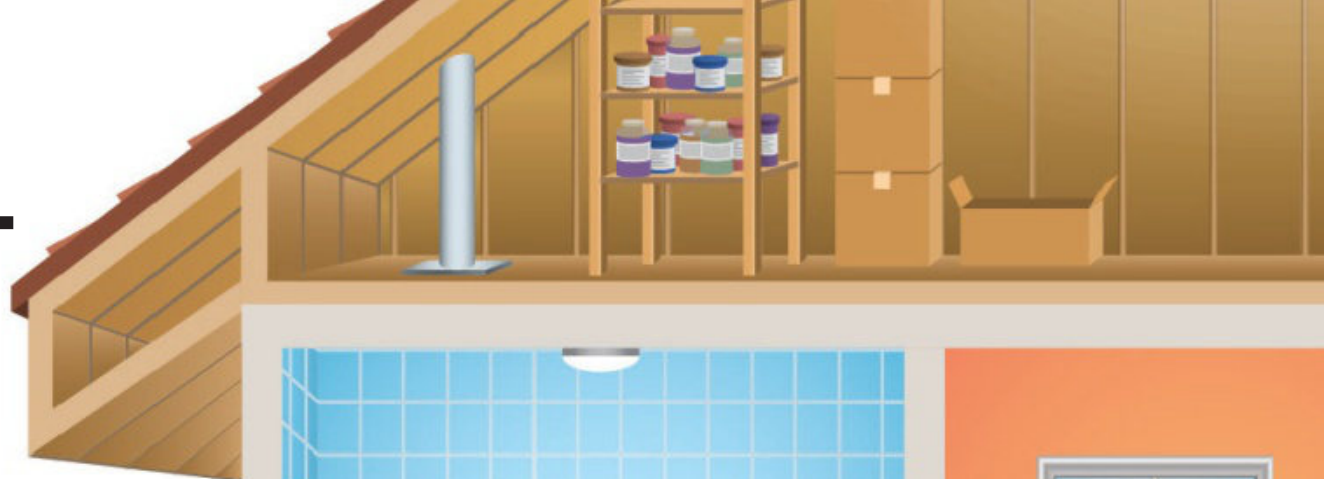
B. Outlets in bath and shower areas are not allowed within an imaginary 3 x 8-ft. zone around tubs and showers.

C. All garbage disposals must have GFCI protection. Also, islands and peninsulas must have a GFCI receptacle every 9 sq. ft. An island of 15 sq. ft., for example, requires two outlets.

D. One- and two-family dwelling units must have an emergency disconnect at a readily accessible outside location.

E. To protect the ever-growing collection of sensitive electronics, all new construction and panel board replacements must include surge protection.

F. All basement receptacles—in finished or unfinished basements—must have GFCI protection. Before, only 15- and 20-amp 125-volt receptacles were required to have it.



MEET THE EXPERT
John Williamson is a master electrician and an electrical inspector in Minnesota.

HOME CARE

Can you paint pressure-treated lumber?

Yes. Pressure treatment doesn't interfere with paint. But the moisture left in the wood does. Waterlogged wood, treated or not, won't hold paint. Let treated wood dry for several weeks. Then test its paintability by sprinkling it lightly with water. If it absorbs drops of water, it'll accept paint. If you must paint treated wood immediately, only use wood that has been kiln-dried after treatment (KDAT). Always use a brush and start with a high-quality exterior primer. Then apply two coats of 100 percent acrylic paint.



You can test pressure-treated wood for paintability by sprinkling it with water.



Range hoods contribute to a healthy home

By removing the by-products of cooking and combustion at the source, range hoods minimize the concentration of particulate matter, nitrogen dioxide and other pollutants in your home. They also reduce odors and moisture.

Studies show that many homes use exhaust fans that move too little air. The worst ones just recirculate the air through filters. All range hoods should vent to the outdoors. Hoods are designed to mount under cabinets, on walls or over islands. Downdraft systems work close to the cooktop.

The amount of airflow you need, expressed in cubic feet per minute (cfm), depends on several factors. The Home Ventilation Institute (HVI) recommends 100 cfm of airflow per linear foot of range, or 150 cfm for an island range. So a standard 30-in. range calls for a 250- or 375-cfm hood. A downdraft system may require more airflow.

Actual performance varies widely. Look for units certified by the Home Ventilation Institute, which verifies that they meet the stated ratings for airflow, sound and energy use. HVI also offers a searchable database for making comparisons.

Be careful not to oversize the fan, which can lead to backdrafting. This occurs when negative pressure in the house causes the airflow through fireplaces, water heaters or other combustion appliances to reverse. If you want a high-capacity fan to ventilate your range-top barbecue, match it to a supply of makeup air to keep the house pressure in balance.

Fan noise is an important consideration. Once you find the size and style you want, buy the quietest unit you can afford. The hood should also be easy to clean. Filters are either aluminum-mesh panels or restaurant-style baffles. Both are dishwasher-safe. Some units let you remove the fan's impeller (squirrel cage) for cleaning. That's a good time to inspect the backdraft louver. It should be clean and pivot freely.



Should you have your ducts cleaned?

Indoor air is often much more polluted than outdoor air. There is very little evidence, however, that duct cleaning improves a home's air quality, according to the EPA and Health Canada.

That said, there are times when duct cleaning makes sense. "When you move into a new house where someone else has been living—maybe with pets—it makes sense to do it," said Rick Welter, an HVAC contractor in Minneapolis. "Duct cleaning gets rids of that 'ick factor.'"

Another good time is after major remodeling or new construction, he said. "I've seen too many guys use vents like a garbage can. They sweep from the floor right into them." Rodents are not typically a problem, nor is mold, he added.

To inspect a duct, remove the vent cover and shine a light into the opening. "Most people will find there's nothing there."

Lens repair gone wrong

In our Sept. '19 issue, p. 18, we published a Handy Hint showing a method of removing scratches from an old pair of eyeglasses using Brasso metal polish. Depending on your lens material and coatings, Brasso may further scratch the lenses and even ruin them. So, we recommend trying this only as a last-ditch effort on a pair of glasses that are otherwise destined for the trash.

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What plants can poison my pet?

The list of household plants that can sicken cats and dogs is long, but list-making can exaggerate the danger.

In 2018, of the 213,773 calls to the ASPCA’s poison control center about possibly poisoned pets, fewer than 11,000 involved plants. The top three causes were OTC medicines (19.6 percent), human Rx medicines (17.5 percent) and human foods (11.4 percent). Plants accounted for just 5.5 percent of all poisoning cases. To play it safe, any time you bring plants or flowers into your house, find out how toxic they are. Lilies, including calla lilies and peace lilies, are poisonous to cats. Even a small amount of a sago palm is toxic to dogs.

Another plantlike toxin is blue-green algae. It often appears as viscous mats along the shore of more stagnant water and may have a rusty brown color. The blooms contain a neurotoxin that can kill a dog within one hour. But most poisonings aren’t from plants, and most aren’t fatal.

If you suspect poisoning, seek help immediately from an emergency vet. Bring the packaging or any remnant of the poison you suspect. The ASPCA operates a poison hotline: (888) 426-4435. The group also offers a searchable database of toxic and nontoxic plants, as well as a free mobile app about toxins focused on dogs, cats, horses and birds.

COMMON PLANTS THAT ARE TOXIC

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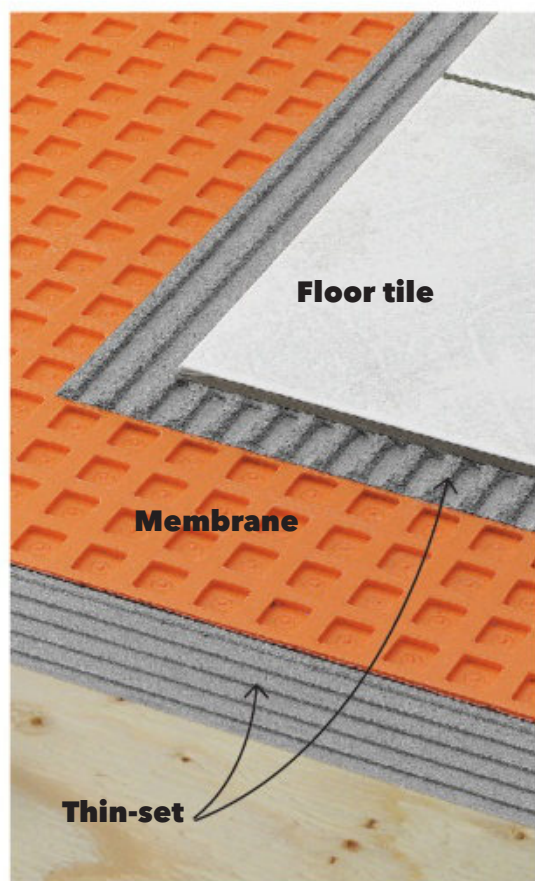
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What's an uncoupling membrane?

Also called “decoupling membranes,” these products are sold in rolls and are installed over sub-floors before the ceramic tile is set. They help isolate the tile from a subfloor that expands, contracts or flexes, reducing the risk of cracks and loose tiles. The membranes are a thin, semirigid plastic. Some are solid sheets that act as a moisture barrier, while others, such as Laticrete’s STRATA_MAT, have moisture vents to speed curing.

The membranes have fleece or mesh on their underside that bonds to the subfloor with thin-set. On the topside are grids or profiles, which differ among manufacturers, and some can accept and hold tubing or electric cables to heat the floor. Examples include DITRA-HEAT from Schluter and HeatMatrix from SunTouch, a Watts brand. Schluter also offers DITRA-HEAT-DUO, a membrane that has additional bonding fleece to provide a thermal break and some sound control.



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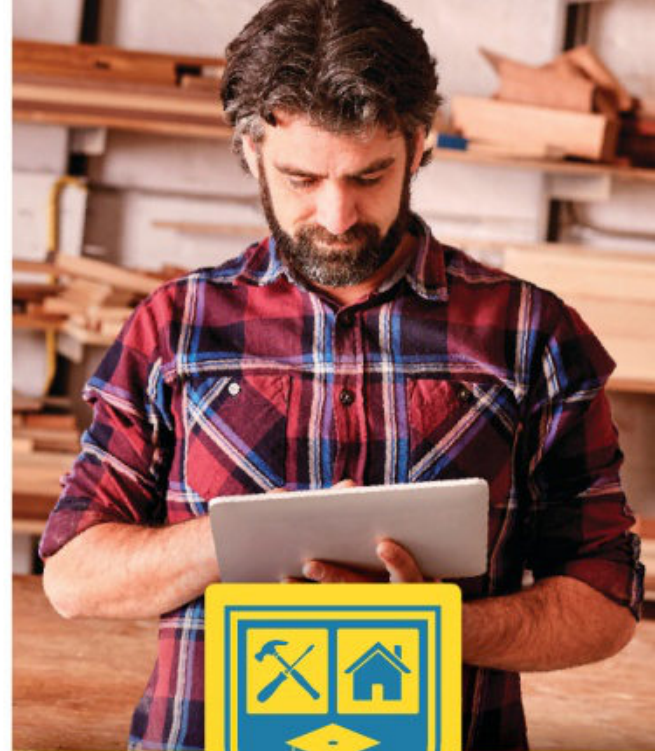
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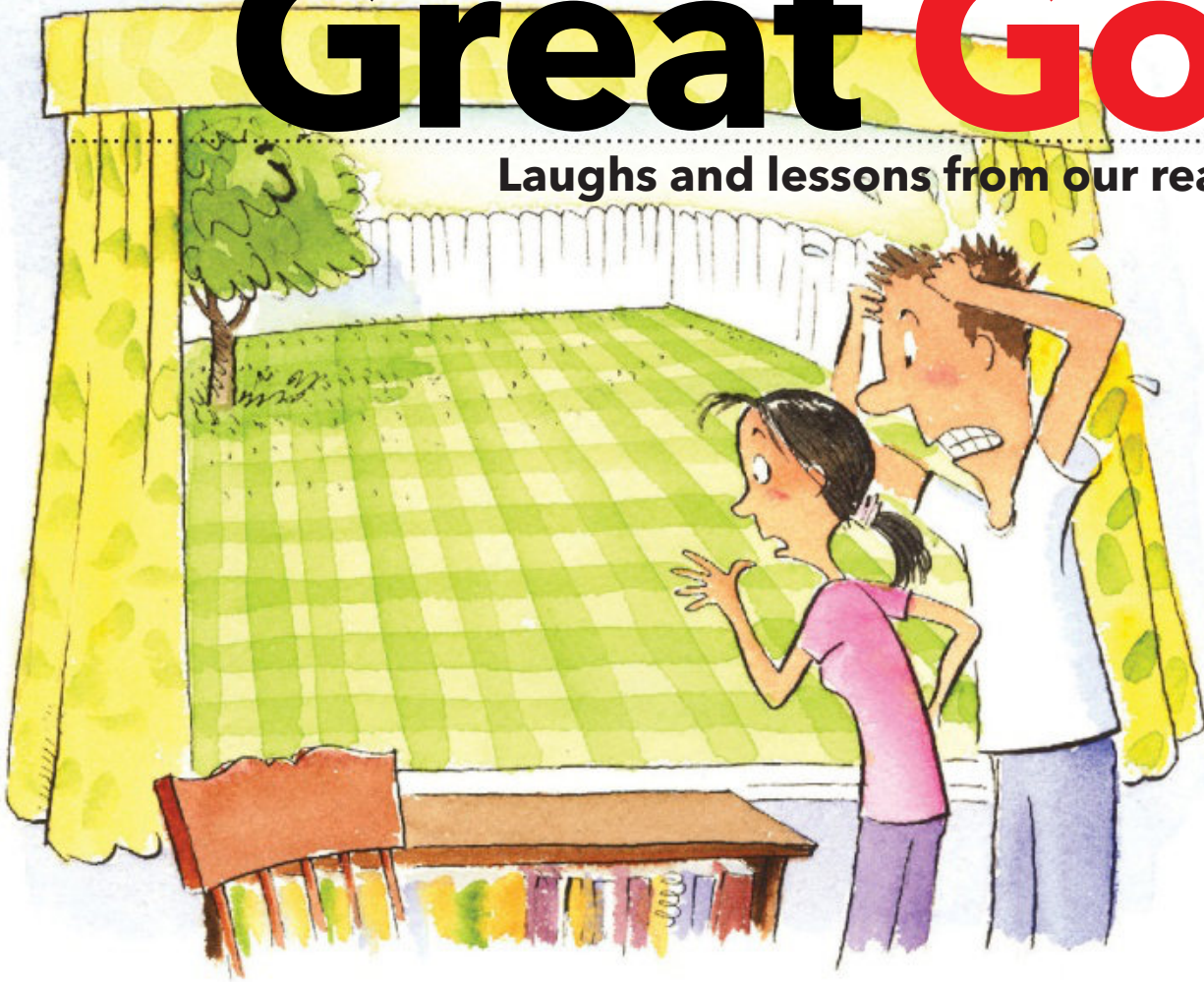


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Laughs and lessons from our readers



MY PLAID LAWN

I bought a drop spreader to fertilize our malnourished lawn. I loaded the hopper, set the drop rate and went to work. After spreading fertilizer down one row, I measured over to the next row and pulled the spreader backward across the lawn. I covered the entire yard this way—pushing the spreader in one direction, then pulling it back the other way. Then I spread fertilizer again, this time going perpendicular to my first pattern.

All seemed well and good until the lawn greened up a few days later. That's when my wife called me upstairs. From the second-story window, we could see an unmistakable plaid pattern over the whole lawn. It turns out that my spreader only drops fertilizer when you're pushing, not pulling. Oops!

ERIC JONES

BRUSH-CUTTER BLUES

My friend Debby had a ton of brush cutting to do in the woods behind her house. "Debby, you have to borrow my commercial-grade brush cutter. It cuts brush like a razor cuts hair!" I bragged. Before she came to get it, I installed a new blade to really impress her.

The following week, she let me know that she wasn't at all impressed with my top-of-the-line tool. She had worked her tail off for three sweaty hours on a 90-degree day without getting very much brush cleared. I was puzzled—until I noticed that all the teeth were nearly ground off the brand-new blade. You guessed it. I'd installed the blade upside down and the teeth were facing backward. I couldn't let her buy me a new \$30 blade, even though she offered.

TIM JOHNSON



NUTS AND BOLTS OF WASHERS

When smoke suddenly started pouring out of my washing machine, I turned it off, pulled the back access panel free and checked the motor. It stank like burned motor windings, but everything else looked good. Instead of buying a new washer, I replaced the motor. Everything seemed to be working again, giving me a fine feeling of another DIY conquest. But 10 minutes into the next load, the new motor burned out too.

At that point, I decided to buy a new machine. After setting aside the old one and wrestling the new unit downstairs and hooking it up, I moved the clothes from the broken washer to the new one. As I pulled out the last pair of blue jeans, I saw the culprit: a 3-in. nail that had apparently fallen through a hole in the drum and kept the motor from turning. Now I have two perfectly good washers and one good motor. Oh, well. I'm not the first person to ruin something with an errant nail.

ROBERT COLLINS



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