

1 family 1 handyman

SMART HOME IMPROVEMENT™



DO IT YOURSELF

EGRESS WINDOW

5 CREATIVE USES
FOR THE SPACE
UNDER THE STAIRS

THE BEST
FLOORING FOR
BASEMENTS

LED "WINDOWS"
THAT LOOK REAL!

DON'T MAKE
THESE SECURITY
LIGHTING
MISTAKES

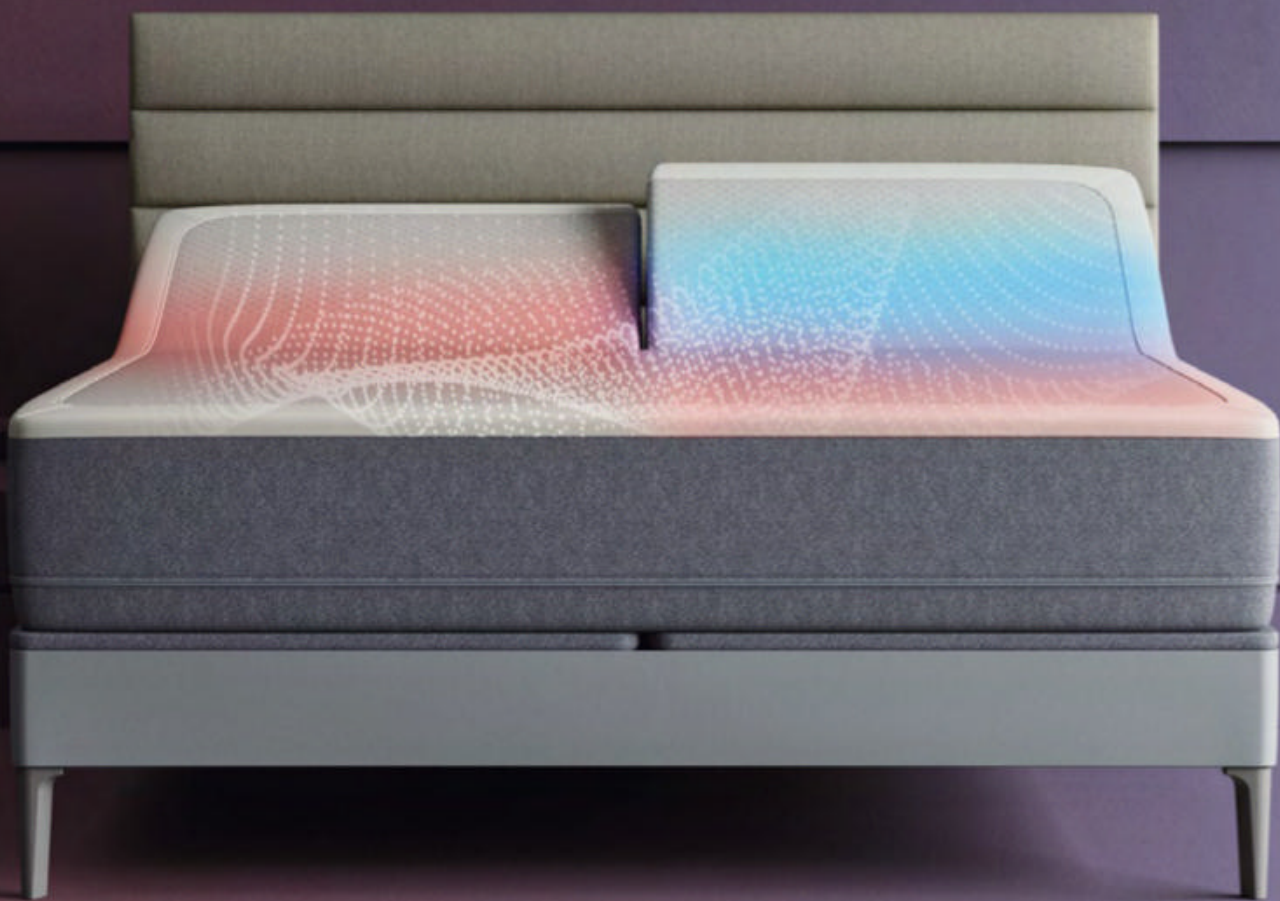
DRY
UP A WET
BASEMENT
P. 52



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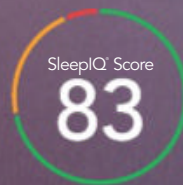
Active cooling and warming by zone on each side



Adjust firmness and comfort on each side



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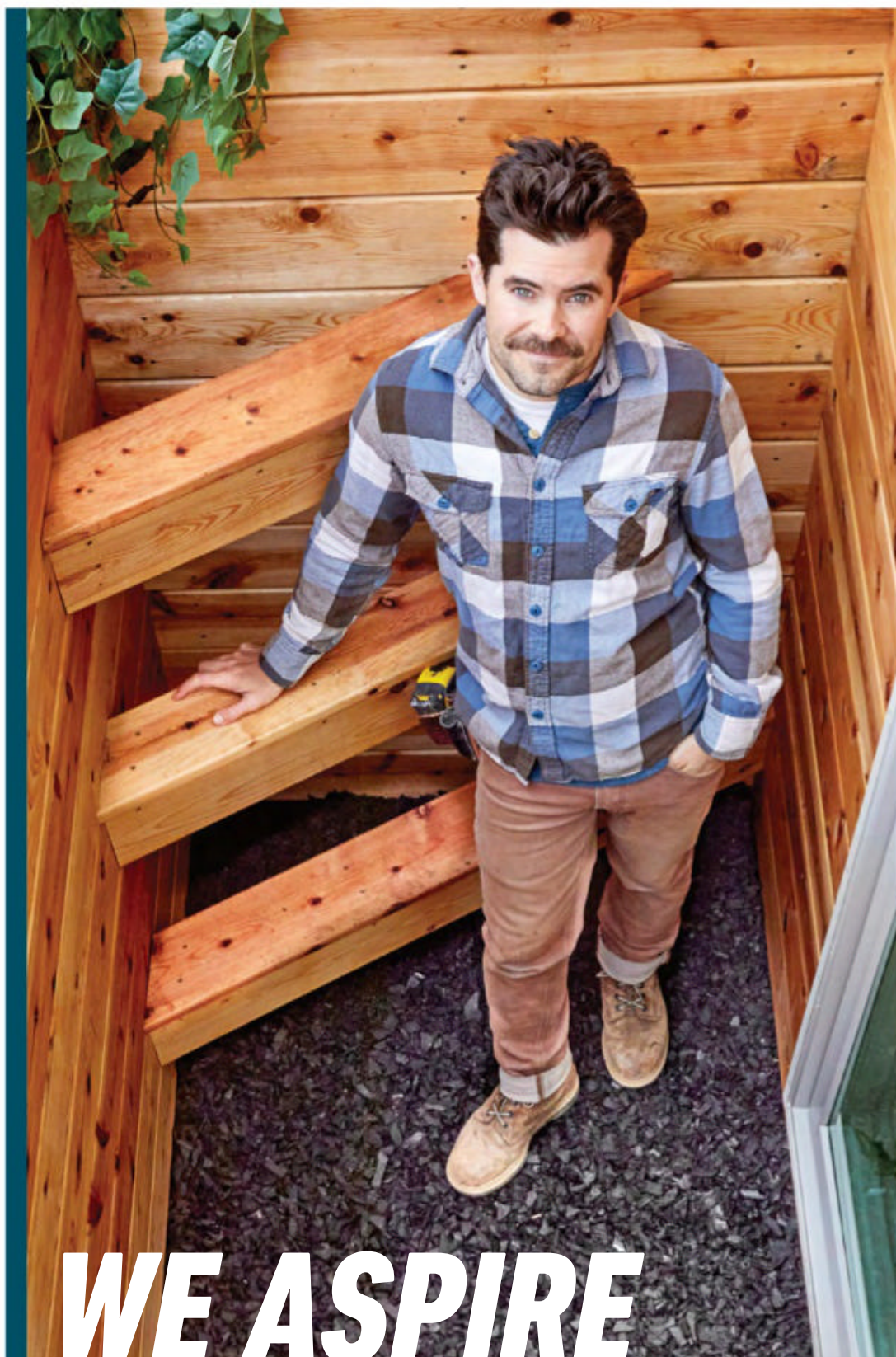


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WE ASPIRE TO INSPIRE

THINK BIG, LEARN BIG!

Whether you've been a subscriber for two decades like my dad or you picked up this issue from the newsstand because it caught your eye, I have no doubt you'll find something useful here. Our team takes great pride in putting together projects, tips and information pieces that not only entertain and inspire but also improve a home.

Our projects are a big source of that pride. They're fun to dream up and build, and they are our way of presenting a mix of basic and advanced skills. I've had the pleasure of growing up with this magazine and watching the projects evolve over 20 years. Some of my recent favorites are the Getaway—the not-so-tiny modern cabin (Sept. '21), the over-the-top Destination Garage (July/Aug. '21), Brad's Danish Modern Chairs (March '22) and Jay's Cabinet Face-Lift (Oct./Nov. '22). With the goal of inspiring you, we choose projects that compel us to think big, keep up with trends and push the limits of our skills.

The egress window I built for this issue is a perfect example. It's definitely not a standard egress window, and we realize that few readers will re-create this project exactly. When most people add an egress window, they dig a hole, install a window just big enough to meet the egress standards, fasten a window well to the foundation and then backfill. I'll show you all those steps—plus skills and tricks you can use for other projects around your home. We hope the steps we added to get a magazine-cover look will be both inspiring *and* practical.

If you're looking for even more inspiration, scan the code below and sign up for one or more of our newsletters. Whether a new homeowner, construction pro, gardener, tool lover or all of the above, you'll find ideas you can build on for your next project.

MIKE BERNER
SENIOR PROJECT EDITOR



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TOPICS!**

WHAT'S NEW?

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WATCHING MR. BUILD IT

Our streaming channel, At Home with Family Handyman, continues to expand its programming with new original series, including the upcoming premiere of *Mr. Build It*.

Mr. Build It, aka Alex Mazhukhin, has over 700,000 followers on his YouTube channel. He started in the DIY space in 2015 when he and his wife, Irina, an interior designer, bought a house in Boise, Idaho. "The house was a fixer-upper in need of a lot of work, and the budget to do it was nonexistent." Following other social media accounts for project inspiration, Mazhukhin says he began watching other people and then practicing on his and Irina's house.

In the new series, Mazhukhin says we can expect to see projects such as building a giant open kitchen, replacing a brown stone fireplace and building a real Swedish sauna in an old unused shed.

Mr. Build It is coming soon to At Home with Family Handyman, which is now available to stream on The Roku Channel, LG Channels, XUMO, fuboTV, Sling TV and more!



A LITTLE TIME ON YOUR HANDS?

You can do a lot to improve your home, backyard and workshop! In this book, you'll find more than 100 cost-saving repairs, cosmetic updates and value-adding projects you'll enjoy for years. It's just \$10 and shipping is free. familyhandyman.com/WQE2



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NEWSLETTER SENT
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DO YOU CRAVE MORE TIPS AND HINTS?

Our readers have the best ideas for simplifying everyday life. Tired of losing laundry in the space between the washer and the dryer? Fill it with foam pipe insulation! To get more tips, scan the code above or sign up at familyhandyman.com/newsletter/

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50%

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green in
summer

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

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

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

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

2 NO NEED TO DIG UP OLD GRASS

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

3 ENVIRONMENTALLY FRIENDLY

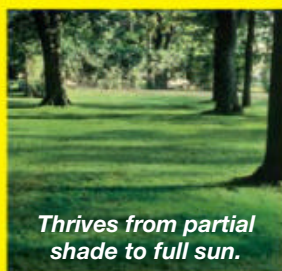
No weeding means no costly chemicals. Amazoy Zoysia lawns naturally resist insects, so you'll save money, while helping to protect the environment. Never expose your family and pets to weed killers and pesticide poison.

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

Can't beat Amazoy as the low-cost answer for hard-to-cover spots, play-worn areas, partial shade and erosion on slopes.

5 IT STAYS GREEN IN SPITE OF HEAT AND DROUGHT

"The hotter it gets, the better it grows!" Amazoy Zoysia thrives in blistering heat, yet it won't winter-kill to 30° below zero. It goes off its green color after hard 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 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 time and get your new lawn faster!

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Max Plugs	Free Plugs	Grass Sheets	Your PRICE	+Shipping	SAVINGS
450	—	3	\$ 47.50	\$22.00	—
750	+150	6	\$ 72.50	\$27.50	25%
1100	+400	10	\$110.00	\$40.00	32%
2000	+1000	20	\$180.00	\$65.00	46%
3000	+1500	30	\$240.00	\$75.00	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	\$ 27.50	\$15.00	—
25	+5	2	\$ 42.50	\$20.00	25%
60	+15	5	\$ 97.50	\$32.00	35%
120	+30	10	\$145.00	\$50.00	53%
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HANDS ON

fh TOOLS, GADGETS + GEAR WE RECOMMEND



PINT-SIZE TRIMMING SAW

The Stihl GTA 26 is a compact, hand-held battery-operated pruner weighing 2.7 lbs. The ¼-in. PM3 chain makes smooth cuts with next to no vibration. The pruner also features an LED display and a comfortable rubber grip. The Stihl GTA 26 ships with a battery, a charger, lubricating oil and a carrying case.

With the battery fully charged, I started cutting a downed maple limb in my yard. The limb was

nearly 17 ft. long and close to 5 in. in diameter at its fattest.

The GTA 26 pruner cut up the branch in no time, although it required multiple passes and one rotation on the thick final cut. It is better on branches less than 2½ in. thick, but it handled thicknesses up to 3½ in. in a single pass. I made 83 cuts over 29 minutes before the battery died.

The safety components include a retractable chain guard and a trigger lockout switch.

Maintenance and lubrication on the GTA 26 are painless thanks to the toolless, single-wing nut bar and chain access. You can find the Stihl GTA 26 pruner at Ace Hardware for about \$180. 

JAY CORK
PROJECT EDITOR



PHOTOS COURTESY OF STIHL, INC.

T-HANDLE HEX KEYS

Hex keys can apply more torque with a lower profile than a screwdriver, so they can fit into places a screwdriver can't access. But what if you need a long reach to loosen a hex bolt? That requires an adapter for your drill or a separate set of T-handle hex keys. Craftsman created this 20-piece L-to-T Hex Key Set, which includes a T-handle adapter for quick and easy conversion.

The kit consists of two 10-piece sets. One is metric, with hex keys ranging from 1.5 to 10 mm. The other is standard, ranging from 1/16 to 3/8 in. In just a few seconds, an L hex key can be converted

to a T-handle by placing it in the corresponding-

size opening and snapping the handle closed. Craftsman's Hex Key Set looks and feels durable. The hinged tool

racks—black for standard and red for metric—help quickly identify the sets in your toolbox. The 20-piece set is available for about \$20 at Lowe's and Amazon. 

ETHAN O'DONNELL EDITOR



PRECISION TORQUE WRENCH ADAPTER

I don't use a torque wrench often, but as a tinkerer, I find it to be an essential tool. Torque wrenches come in various styles and ratings. Some are best for ultralight carbon fiber bicycle components, others for heavy-duty farm or construction equipment.

The Performance Tool M206 Digital Torque Adapter is a small attachment that converts a standard 1/2-in. socket handle or breaker bar into a torque wrench with a rotating digital readout. It measures between 30 and 150 ft./lb. of torque, with five units (kg/cm, kg/m, ft./lb., in./lb., N/m) to choose from, and includes adapters for 3/8-in. and 1/4-in. sockets.

The adapter features a programmable interface with 10 adjustable preset values and informs you audibly and visually when those values have been reached. The manufacturer claims the torque wrench is accurate to +/-2%. I ran a simple test to verify, and it was in that range.

Once I programmed the torque settings for our vehicles, I rotated both sets of tires, and now we have the torque settings saved for future rotations.

Changing the oil on my motorcycle meant removing some covers and guards attached with delicate screws and bolts. In this instance, I freehanded it without presetting



any torque settings. This was more difficult because of the precision of the digital gauge.

The Digital Torque Adapter isn't difficult to use, but with its five buttons with multiple functions, I won't be discarding the owner's manual anytime soon. The Performance Tool M206 Digital Torque Adapter is available online for about \$65. 

ETHAN O'DONNELL EDITOR



A COMPACT CONTRACTOR SAW LOADED WITH FEATURES

Whether you're a DIYer or a contractor, I'm confident you'll like this new DeWalt saw. The compact size, combined with the rip capacity and collapsible mobile stand, make this tool a standout. Job site table saws—often called compact, benchtop or portable—are the smaller and easier-to-haul cousins of cabinet saws. They're perfect for a contractor or anyone with a small shop.

This DeWalt saw (model No. DWE7491RS) features a robust 15-amp motor, a cast aluminum table and a full-size $\frac{5}{8}$ -in. arbor that accepts 10-in. saw blades so you can rip boards up to 3 in. thick. The accurate rack-and-pinion fence allows you to cut stock up to $32\frac{1}{2}$ in. wide—a best-in-class capacity. The sturdy, collapsible stand with wheels took only a few minutes to assemble. The saw comes with a 24-tooth blade, miter gauge, push stick, blade guard and $2\frac{1}{2}$ -in. dust port.

I look for maneuverability, power and precision in a job site table saw. I carried the saw up and down a flight of stairs, as well as in and out of the bed of my truck a few times. Even at nearly 100 lbs., it was very easy for me to handle. And that weight is a real plus when the saw is in use; it dampens vibration and keeps the saw stable.

To test the saw, I worked through the scrap pile in my garage. I ripped 2x6s, a variety of plywood, MDF, OSB and melamine, birch, oak and a 4x4 fence post. It easily cut everything I fed into it. The highlight was the rack-and-pinion fence system. Its accuracy and ease of use are outstanding.

The toolless riving knife release makes switching between the riving knife and blade guard easy. You can buy this saw at home centers for about \$650. 

BRAD HOLDEN DEPUTY PROJECT EDITOR



PEEL & STICK WALLPAPER

Wallpaper accent walls are popular, and new peel-and-stick papers are making them easier to do yourself. Tempaper features colorful designs for home offices, bedrooms or kids' rooms. It comes in $20\frac{1}{2}$ -in. wide x $5\frac{1}{2}$ -yd. or 11-yd. rolls. The wallpaper adheres to any smooth surface, and its adhesive back won't leave residue or damage your wall or paint whether you keep it up for a month or five years. The clear instructions cover prepping your wall, surfaces to avoid, tools you'll need, and application and removal steps. A felt-covered squeegee is included for removing bubbles during application.

For my project, I measured the height of the wall and precut the roll into shorter strips. I hung the wallpaper on a smooth, eggshell-finish painted wall after cleaning the surface with an isopropyl alcohol and water solution (1:1 ratio) per the instructions. The adhesive is strong, so fixing a mistake took some muscle. But even with force, the paper didn't rip or stretch. As with any wallpaper, aligning the patterns can be challenging, so buy more than you think you'll need. Tempaper is available at Tempaper.com for \$43 to \$125 per roll. 

LAURA EIKEN CONTRIBUTING WRITER



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OFFER

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BACK GUARANTEE

ROSE GOLD &
BLUE FINISH

CHRONOGRAPH
MOVEMENT

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CORD-FREE COMPRESSOR

With my background in trim carpentry, I'm familiar with the trials of dragging around an air compressor and nail gun from outlet to outlet to nail moldings, casings and trim, so I was eager to try this Metabo cordless air compressor.

The HPT 36V MultiVolt 2-Gallon Cordless Air Compressor outputs a max 135 psi and 1.6 cfm at 90 psi. It

can be powered by a single 36-volt battery or an AC adapter that plugs into an outlet (both sold separately). The brushless motor is nearly maintenance free. The tool features a ¼-in. brass industrial coupler and weighs less than 30 lbs. with the battery.

After charging the 4-amp hour battery and setting the psi to 90, I shot 15- and 18-gauge nails through ¾-in. underlayment.

While shooting 15-gauge nails, the compressor kicked on every 8 to 10 nails and took 16 to 24 seconds to refill, depending on the battery power. I drove 153 15-gauge nails on a single charge. Shooting 18-gauge nails, the tank refilled every 18 to 21 nails, and did this 21 times before the battery

died, shooting a total of 412 2-in. nails. With the tool running at about 78 decibels, you'll want earmuffs.

This top-notch tool is worth every penny of the \$300 price tag. A Metabo battery and charger, sold separately, will cost about \$120.

You can find them at Lowe's and Amazon. 

MIKE BERNER
SENIOR PROJECT EDITOR



GO-TO UTILITY KNIFE

Every toolbox should have a quality utility knife. I usually have several, since they're often misplaced and I end up buying another one. On one such occasion I picked up the Irwin ProFlip Utility Knife.

The Irwin ProFlip mechanism allows quick one-handed opening and closing. Other features include a protected blade change button that prevents accidental blade release, onboard blade storage and a sturdy metal belt clip to keep it at hand. The Irwin ProFlip Utility Knife is available at Lowe's and online at Acmetools.com for about \$15. 



ETHAN O'DONNELL EDITOR 

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HANDY HINTS



CLEVER SOLUTIONS FROM OUR READERS



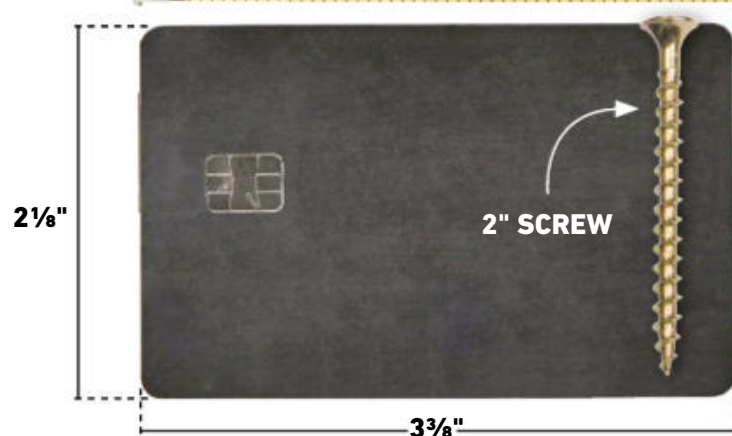
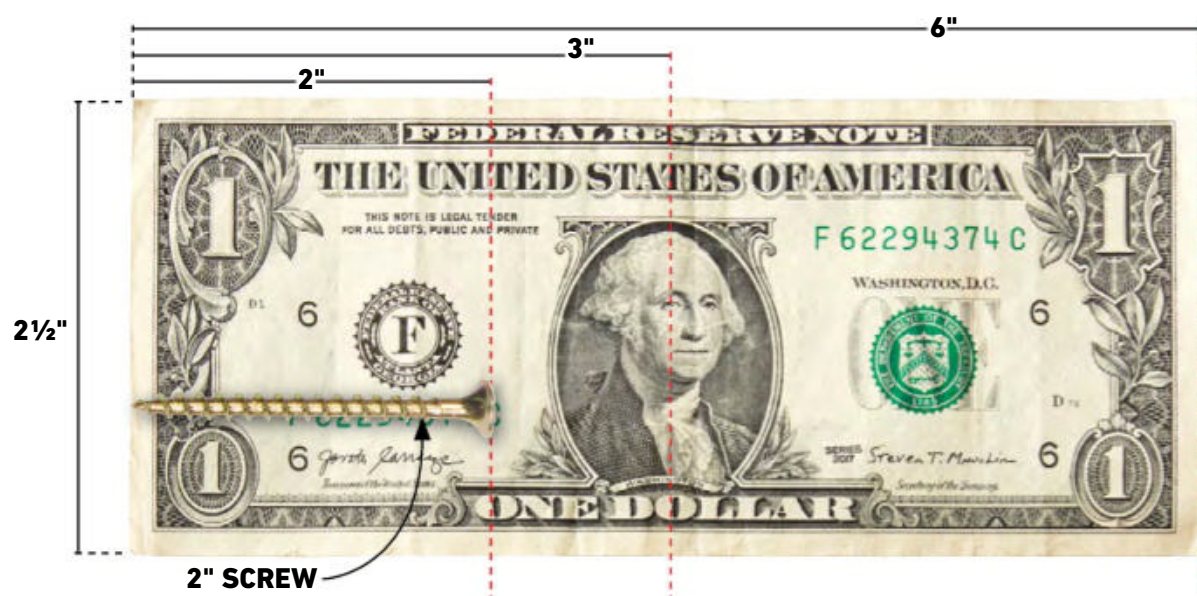
FLOOR RULER

No need to scramble for a ruler every time you need to measure something big. Draw a ruler on your shop floor with a permanent marker. It won't be accurate enough for precise measurements, but for rough cutting it will save you time and effort. When the markings start to wear off, just redo them.

CHRISTINE SMITH

SHARE
YOUR
HANDY
HINTS
WITH
US

submissions@familyhandyman.com



MORE FOR YOUR MONEY

Next time you need to estimate a measurement and don't have a tape measure with you, use a dollar bill or a credit card. Each bill is slightly over 6 in. long, 3 in. folded in half and 2 in. folded in thirds. And they're slightly over 2½ in. wide. A credit card is about 3⅜ in. x 2⅛ in.

BRUCE KOPACEK



FENCE-POST HOLDER

As a novice sinker of fence posts, I was having a heck of a time keeping the post plumb while I poured concrete into the hole. My Workmate workbench saved the day.

Here's the system: Position the workbench over the hole, clamp the post in place in the workbench and plumb it, then pour the concrete. By the time you have dug the next hole, the concrete will be firm enough to gently lift the workbench off the post.

KEITH JOHNSON



FURNITURE STRIPPING HELPER

When stripping old paint or varnish, how do you get rid of the stuff once it's on your putty knife? Cut a semicircular opening in the side of an empty gallon jug, then clean the loaded scraper on the flat edge of the hole. When you're done, upend the jug and use the neck of the jug as a funnel to pour the stripper into another container. The stripper will be ready for reuse.

MATT KUDUK



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TRAILER WIRE SAVER

I finally got tired of the trailer wiring harness hanging down behind my pickup truck. It looked ugly and was always exposed to the elements. The solution was simple: a magnetic key storage box.

KEN MARETKA



EASY PAINT SEAL

I keep a roll of Press'n Seal with my painting supplies. It's perfect for covering roller trays, paint pails, rollers and brushes in between coats. This saves me so much time. I can keep all my painting tools covered and clean them just once, even after two or three coats. I even use it to cover coffee cans of leftover paint.

CINDY BOGGS



OVERHEAD STORAGE FOR GARDEN TOOLS

Rakes, shovels, brooms and other long-handled tools seem to be in the way no matter how they're stored in the garage. Here's a rack to keep them tidy: Cut two pieces of plywood about 12 in. x 48 in. and drill matching 2-in. holes in each, spaced about 6 in. apart. Mount the racks on crossies below your garage roof rafters or on floor joists.

A.J. TOKER



LONG-REACH VACUUM

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BY MIKE BERNER

INSTALL AN EGRESS WINDOW

THE PAYOFF IS BIG: A BRIGHTER, SAFER BASEMENT

One of the best investments you can make in your home is to add finished square footage, and for many homes, the basement is the best place to do that. What many people don't know is that the new habitable space in your basement requires an egress window to provide an exit in case of an emergency. Installing one is a big job, but the larger window will flood your basement with natural light and make it code compliant.

WHAT IT TAKES

TIME	COST	SKILL LEVEL
5 to 7 days	\$5,000+	Advanced

TOOLS

Mini excavator (rental), shovels, rakes, hand tamper, concrete saw, 8-lb. maul, drill, impact driver, circular saw/miter saw, table saw, oscillating multi-tool, hand seamer, basic carpentry tools



**SCAN THIS CODE
TO WATCH US
INSTALL THE
EGRESS WINDOW
AND WE'LL
FROM START
TO FINISH.**

BEFORE YOU START

Adding an egress window is a big job, and it's important to plan your project to meet the building requirements in your location. Here are the steps I took before starting to excavate.

■ **APPLY FOR A PERMIT.** This process could take a few weeks. My city required detailed plans of the well, the dimensions of the window and rough opening, the size of the header and a drawing of the property, including the house.

■ **ENGINEERED DRAWING.** The retaining walls that made up our well were tall enough to require an engineer's approval. I sent my plans to a local

engineer who gave me a new drawing with a stamp of approval to include with my permit application. If you buy a manufactured well, this step is likely unnecessary, but the final call is with your city's building department.

■ **CALL THE DIGGING HOTLINE.** When you're digging, even just a few inches deep, call to have underground utilities located and marked. Digging is dangerous if you don't know where the utilities are.

If you skip this step and hit a gas, water or power line underground, you'll risk the lives of yourself and others, *and* you'll be on the hook for the costly repairs. So be sure to call 811 before your project. The process varies by state, so call a few days ahead of your project.

**FIGURE A
PLAN VIEW**

3047 EGRESS WINDOW
INSTALLED PER MFR. &
IN COMPLIANCE w/CODE;
BOTTOM OF SILL NO LESS THAN
6" FROM EXTERIOR GRAVEL BASE

1½" x 2¼" x 14-GA. ZINC PLATED STEEL
ANGLE ATTACHED TO MASONRY WALL
w/ ¼" x 1¼" CONCRETE SCREW @ 8" O.C.
INSTALL w/ SHORT LEG TO MASONRY

80d GALVANIZED
8" POLE BARN NAIL
OR EQUIVALENT
@ 12" O.C. EA. PLY

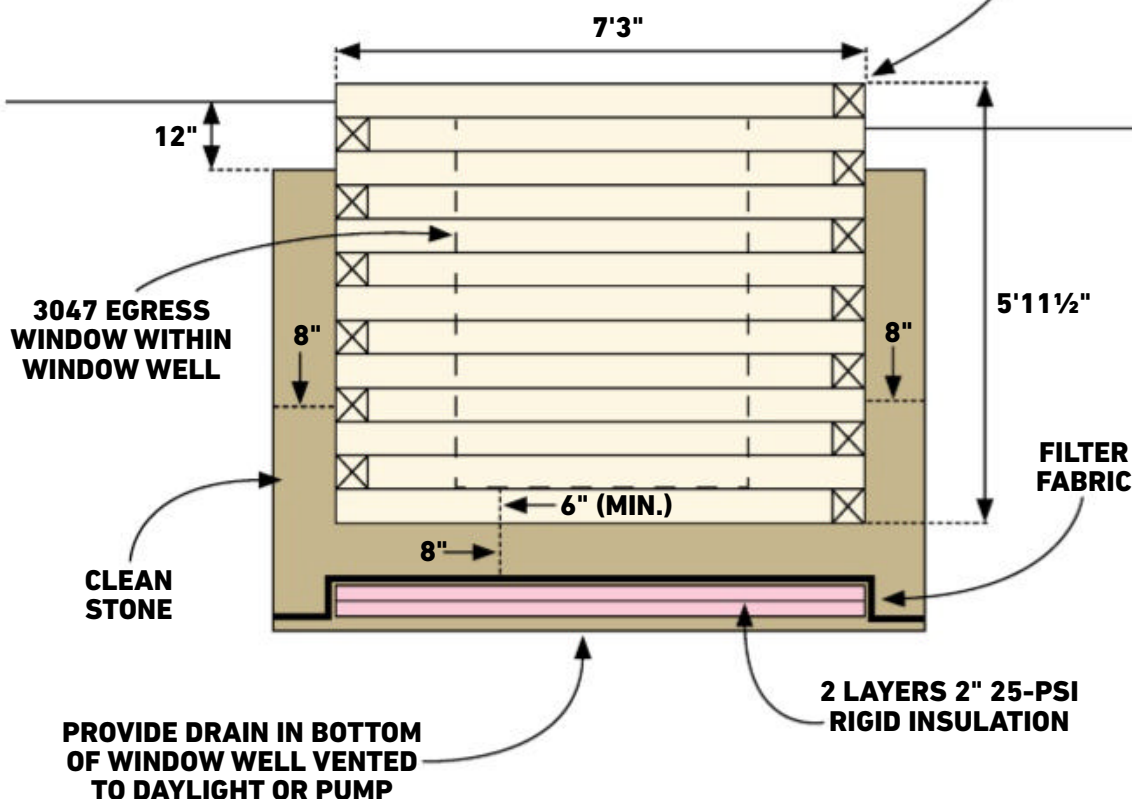
6x6 PT - ALTERNATE
LAP @ EA. COURSE

7'3"

4'0"

**FIGURE B
ELEVATION VIEW**

6x6 PT - ALTERNATE
LAP @ EA. COURSE
AS SHOWN



RULES FOR EGRESS WINDOWS

There are several requirements for installing an egress window. Here are the minimum requirements identified by the building code:

- The opening needs to be 5.7 sq. ft.
- The minimum width is 20 in.
- The minimum height is 24 in.
- The well needs to provide a clear space of 3-ft. x 3-ft. when the window is open.
- From the inside the sill height cannot exceed 44 in.

1 DIG THE WINDOW WELL

Following my plans, I marked the location of the window well with marking paint. I rented a mini excavator to make the digging much easier. It was well worth the \$450 to avoid hand digging. Have a plan for the dirt that's being removed; it will be more than you anticipate. We took the nearly 10 cubic yards of dirt to a nearby compost site.

2 ADD A DRAIN

Once the well was dug and free of loose dirt, I dug a trench underneath the house and fed a drainpipe to meet the drain tile system. This process was required by the city to prevent water from pooling and then freezing against the house, potentially damaging the foundation. The drain provides a path for water that collects in the window well to get to the sump pump. Once the drainpipe is in place, fill the well with clean rock.

3 LEVEL THE BASE

Use any remaining loose dirt to create a slope toward the drain. Then cover the bottom surface with geotextile fabric and a 2-in. layer of clean rock, leveled and tamped. The fabric keeps the rock from settling into the dirt and causing the entire base to shift.

4 INSULATE THE FOOTING

My window is 55 in. tall, and to make room for the installation, we dug down closer to the footing than I'd normally like to. Because we live in an area that experiences freeze/thaw cycles, the footing needed frost protection. My solution was to add two layers of 2-in. rigid insulation that was rated to 25 psi. (That rating is important to ensure the rock won't crush the insulation.) I cut out a hole to feed the drain through and positioned the insulation in the bottom of the well.



PRO TIP

The rock I'm using isn't "gravel" or "class V." When I call to order it, I ask for "¾ in. clean rock." It's an angular rock that's free of silt that could clog the drain. It compacts well, creating a solid base for the retaining wall and a drainage field.

MATERIALS LIST

ITEM	QTY.
Clean ¾" rock	7 tons
6x6 critical-structure treated timbers	30
2x4 x 8' pressure-treated lumber	4
2x6 x 8' cedar lumber	45
2x10 x 8' lumber	1
2x12 x 8' lumber	2
5/4x6 x 8' cedar decking	45
4" x 10' perforated drainpipe	1
2" x 4' x 8' 25-psi rigid insulation	5
12' 6" x 27' 6" geotextile fabric roll	2
1" x 8' Z-flashing	1
3" sidewall flashing	8'
Flexible flashing tape	1 roll
Seam tape	1 roll
48" x 25' fiberglass screen	1 roll
2¼" x 1½" x 72" steel angle	2
6" timber/lag screws	8
8" timber screws	200
1¼" concrete anchors	25-ct.
2½" concrete anchors	25-ct.
Composite deck screws	250-ct.
1¼" roofing nails	1-lb. box
Silicone	



MEET THE BUILDER



MIKE BERNER, SENIOR PROJECT EDITOR, LIKES BEING IN THE TRENCHES TACKLING COMPLICATED PROJECTS.



5 ADD ROCK FOR THE TIMBER WALL BASE

I covered the insulation with another layer of fabric, then added 8 in. of clean rock on top. The extra layer of fabric will keep the sharp rock from puncturing the insulation. Make sure the rock is level and compact it with a hand tamper.



6 LINE THE WELL

Before laying the timbers, I lined the well with geotextile fabric. I unrolled the fabric along the dirt walls and folded it over the edges of the hole. The fabric will keep dirt from entering and clogging the drainage space behind the timbers.



7 BUILD THE RETAINING WALL

After you've established a level base of clean rock, start building the retaining wall. The first course of timbers must be level along the length and width of the well. You might have to tamp and move rocks to position this first course.

Each consecutive course will be placed by alternating the overlapped corners. As the timbers are stacked, check that they are plumb or leaning out slightly, and fasten each course to the previous one with 8-in. coated timber screws every 12 in.

8 BRACE THE END WALLS

To keep the ends of the retaining wall from being forced in during backfilling, I added a length of steel angle against the foundation, on the inside of the well. I drilled pilot holes with a hammer drill and fastened the angle to the block wall with construction adhesive and 1¼-in. concrete screws. The retaining wall needs to be able to shift a bit, so don't fasten it to the steel angle.



STEEL
ANGLE

8

9 BACKFILL THE WELL

Fill the space outside the well with clean rock. The rock allows water to drain away from the wall and gives it space to dry, adding longevity to the treated lumber. Leave about 4 in. of grade at the top to be filled with topsoil.

10 COVER THE BACKFILL

Fold the rest of the fabric over the rock and tack it to the retaining wall. Then cover the fabric with topsoil, maintaining a slight slope away from the well. The fabric prevents dirt and silt from clogging the drainage space.

11 INSTALL A HEADER

Before cutting the hole in the wall, I needed to reinforce the rim joist with a header to span the new opening. I used the header span tables in the International Residential Building Code to determine how many 2x10s I needed to add to support the larger opening. I used construction adhesive and lag bolts to fasten two 2x10s, one at a time, to the existing rim joist. I cut each new ply 8 in. longer than the opening to ensure there was enough bearing on each side of the opening.



3/4" CLEAN
ROCK

9



10



11



12

REMODELING CHALLENGES AND SOLUTIONS

I ran into a challenge where our new well transitions to the stucco siding. My solution was to add a drip ledge above the well. This creates an eave over the window, allowing the water to shed in front of the window instead of onto it. It also makes a smooth transition from the existing stucco to the thicker insulation and cladding I'll add in the following steps.



13

12 ADD FLASHING

The flashing behind the existing siding and water-resistant barrier is vital. To fit the flashing behind the stucco and felt paper, I lightly pried the layers from the house and cut any nails that were in the way with an oscillating multi-tool. Once the flashing was tucked behind the stucco, I pressed down on it to slope it away from the house.

13 FASTEN THE LEDGE

I ripped a cedar 2x6 to about 4 in. wide and gave it an 8-degree bevel. Then I drilled evenly spaced pilot holes on its edge. I fastened the ledge to the rim joist with 6-in. timber screws.



14

14 CUT THE WINDOW OPENING

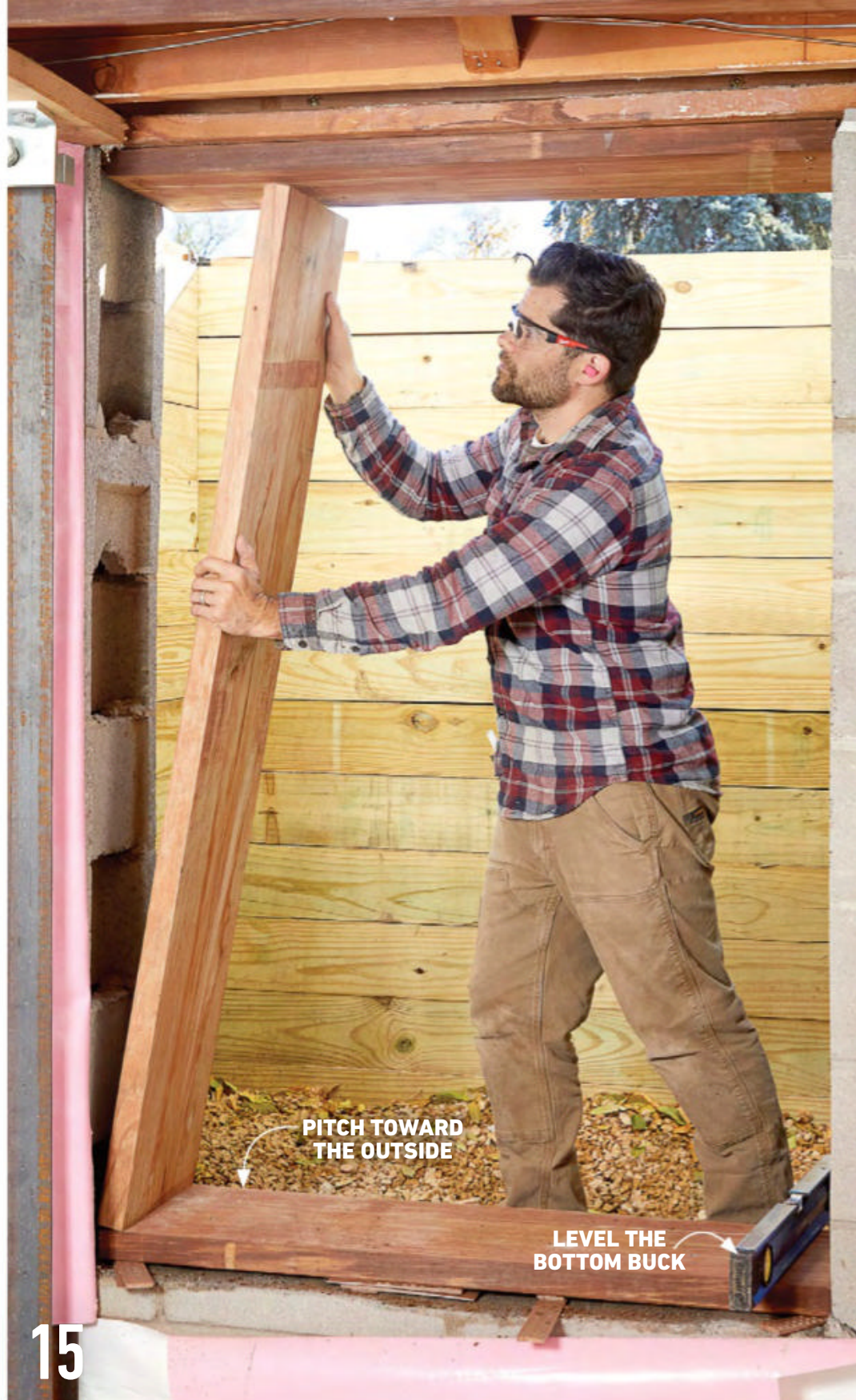
With the well structure built and the drip ledge and header installed, we were ready to cut the new opening. I measured my window and added 4¼ in. to the total height and width to determine the rough opening size. I transferred those measurements to the block wall.

Then, donning a rain poncho, ear and eye protection, and a respirator, we carefully cut the block. To keep the chain or blade from binding, we cut the bottom first, then the sides.

15 INSTALL THE WINDOW BUCKS

Once the cut blocks were removed, I filled the cores of the bottom wall blocks with concrete and fit window bucks around the opening. I cut 2x12 pressure-treated wood bucks to fit the width of the opening and fastened the top buck to the bottom of the sill plate with screws. Then I leveled the bottom buck with shims, gave it a slight pitch outside and fastened it to the core-filled blocks with concrete anchors.

Note: As you'll see in Photos 16, 17 and 19, I set the bucks proud of the block wall by 2 in. to line up with a layer of rigid insulation that will be added to the outside of the wall.



PITCH TOWARD THE OUTSIDE

LEVEL THE BOTTOM BUCK

15

PICK A CONCRETE SAW

Typically, a window opening is cut with a **circular concrete saw**—a large gas-powered tool equipped with a diamond blade and a hose connection. These saws need a constant flow of water to keep the blade cool and require you to make cuts on both sides of the wall. But making the cut on the inside fills the house with gas fumes and floods the floor.



CIRCULAR CONCRETE SAW



CONCRETE CHAIN SAW

We used a **concrete chain saw** instead. The chain saw made a clean cut all the way through the 12-in. block from the outside, keeping fumes and puddles out of the house.



16



17



18

16 FLASH THE OPENING

I used 6-in. wide flexible flashing tape to create a window pan. I started by covering the front of the sill, wrapping the tape up the sides about 6 in. Then I carefully stretched the tape around the corners and the front of the bucks. Next I applied the tape to each side, overlapping the tape on the sill. Finally, I covered the top of the bucks, making sure to adhere the tape up the block wall, sealing any entry points where water could get inside the framing.

Note: On a normal window, the flashing tape folds around the window buck and adheres flat to the block. That seals the gap between the block and the buck. In this application, you seal the gap with caulk and protect the wood with the tape.

17 PLACE THE WINDOW

Apply a continuous bead of silicone along the sides and top of the window bucks as close to the inside edges as you can get. Don't seal the bottom. Then, with a helper, set the bottom of the window in the opening and carefully tip the window in until the nailing flange meets the window bucks.

18 LEVEL AND PLUMB THE WINDOW

With your helper outside holding the window, head inside to position it. First, raise the window ½ in. off the sill and level it with a few shims. Then center the window and have your helper drive one roofing nail in each bottom corner of the window's nailing flange. Next, place a level against the hinge side and adjust it plumb. Use a few shims to keep it in place and check the other side.

Check the window to make sure it's level and plumb, and also check that the measurements from opposite corners are equidistant. Then drive a nail in each top corner of the nailing flange. Before nailing the rest of the window, place the level back on the sides. If there are gaps between the frame and the level, use shims to straighten the frame, then have your helper nail the sides and the top of the window's flange.

19 INSULATE THE WALL

Believe it or not, the soil we removed from against the house was insulating the basement, and we need to replace it with a 2-in. layer of rigid insulation. I ripped a pressure-treated cleat to match the depth of the insulation and fastened it with concrete screws a few inches from the retaining wall. Then I pressed the insulation between the cleat and the wood bucks. I pressure-fit insulation all the way around the window and sealed all the seams with sheathing tape.

20 ADD A DRIP CAP

I cut a piece of 1-in. Z-flashing to ½ in. wider than the window. Then I used a hand seamer to fold the ends down to cover the sides of the window. After nailing on the drip cap, I covered the flange with flashing tape to keep out water.



19



20



PRO TIP

I covered the blue rigid insulation with leftover landscape fabric to keep it from showing through the cladding.

21

21 ADD FURRING STRIPS

Before dressing up the inside of the well with cedar, I ripped a pressure-treated 2x4 into 1/4-in. thick strips and fastened them inside the well every 2 ft. This will allow water to drain away to keep the cedar cladding and the timbers free of rot.

22 INSTALL PEST SCREEN

To prevent pests from finding a home behind the cedar cladding, I lined the inside of the well with a roll of fiberglass screen mesh. I made sure the mesh was taut and stapled it to each furring strip.

23 CLAD THE WALLS

I used cedar deck boards to clad the inside of the well. I cut each piece to length and fastened the boards to the timber wall with composite deck screws through each furring strip. I made sure each board was level so each course would line up at the corners.



22



23



8" TIMBER
SCREW

PRO TIP

I purchased this window at a builders' reuse center for just over \$200. I didn't mind that it didn't match the rest of the windows, but I didn't like the center piece of trim. I was able to remove it after the window was installed.

24

24 BUILD THE STAIRS

I glued and screwed two 2x4s together, and then I cut one end at 60 degrees and the other at 30. Starting with the bottom stair, I fitted each one into the corner, shortening each step as I worked my way up the wall. In my city, each step is required to be 12 in. wide, at least 3 in. away from the wall, with no more than 18 in. of rise between them. I added deck boards to the top and face of the stairs to match the rest of the well.

25 TRIM THE WINDOW

I used Boral TruExterior boards to trim the window. I ripped them to 1 1/4 in. wide and fastened them on edge with composite decking screws.

26 SEAL THE WINDOW

Caulk the trim to the window at the sides and bottom. I used a door-and-window sealant that remains flexible after curing. The caulk prevents water from getting trapped between the window and the trim. I capped the top of the retaining wall with cedar decking and finished the well with a few coats of tung oil. 



26





WHAT IT TAKES

TIME	COST	SKILL LEVEL
2 days	\$150 per window	Beginner

TOOLS

Table saw, pocket hole jig, drill/driver, miter saw, random orbital sander, drywall saw



BASEMENT DAYLIGHT

BRIGHTEN A DARK ROOM WITH AN LED “WINDOW”



SCAN THIS CODE
TO WATCH A
VIDEO OF THE
BUILD AND
INSTALLATION.

BY BRAD HOLDEN

Want to bring daylight into a finished basement, but don't want the labor and cost of adding an egress window? If you don't need an egress window to meet code, here's a way to gain the light along with the illusion of a beautiful new window. You won't get an outdoor view, but a basement window rarely gives much of a view anyway.

We used thin LED panels with adjustable color temperature, set in easy-to-build window frames. Getting power to the panels takes a little electrical work, but the lights are operated by remote control or a battery-powered switch that fits in a junction box, so you don't have to hard-wire a switch.



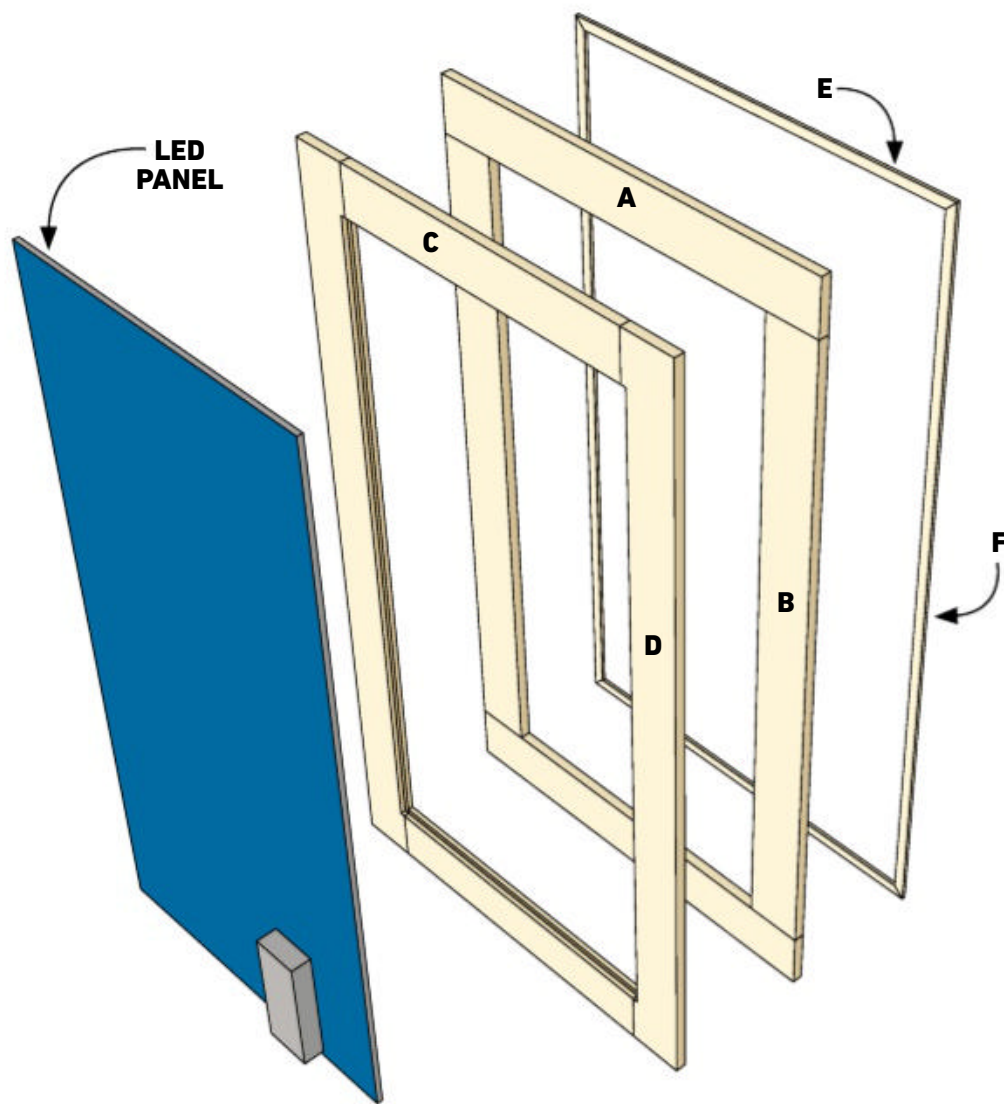
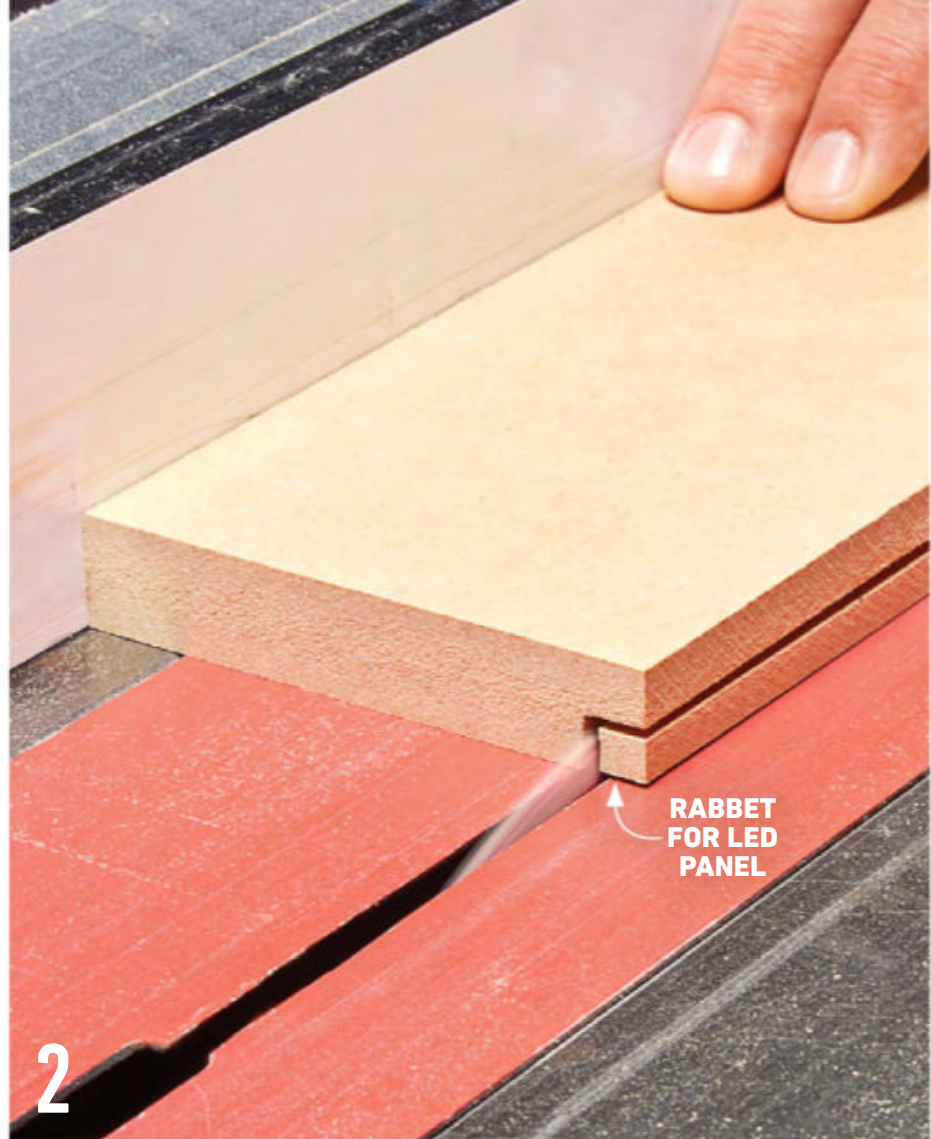


FIGURE A
LED WINDOW

OVERALL DIMENSIONS:
31"W x 55"H x 1 $\frac{3}{4}$ "D

1 BUILD THE FRONT FRAME

The frame consists of a front and a back, each cut from $\frac{3}{4}$ -in. MDF. Determine the frame size needed for your light panel, and then cut the front and back frame pieces. We chose to make a 4-in. wide frame for our LED panel. You will have to decide what looks best in your room.

The front and back frames are identical in size, but the lengths of the parts are different so that the joints of the two frames overlap (see Figure A). Assemble the front frame using wood glue and pocket screws.

MATERIALS LIST

ITEM	QTY.
$\frac{3}{4}$ " x 48" x 96" sheet of MDF	1
$\frac{1}{4}$ " x $\frac{3}{4}$ " screen molding	16'
Wood glue	
Sandpaper	
Paint and primer	
2' x 4' LED Even-Glow Tunable White Panel Light (\$110) and remote control for LED panel (\$10) from superbrightleds.com	
14-2 NM-B cable	

CUTTING LIST

KEY	QTY.	DIMENSIONS	PART
A	2	$\frac{3}{4}$ " x 4" x 31"	Front frame top and bottom
B	2	$\frac{3}{4}$ " x 4" x 47"	Front frame sides
C	2	$\frac{3}{4}$ " x 4" x 23"	Back frame top and bottom
D	2	$\frac{3}{4}$ " x 4" x 55"	Back frame sides
E	2	Cut to fit	Top and bottom trim
F	1	Cut to fit	Side trim



FILL GAP
IF DESIRED

2 RABBIT THE BACK FRAME

Cut rabbets on the back inner edges of the back frame. These rabbets should be deep enough to allow the LED panel to sit flush with the back side of the back frame. For our LED panel, the rabbets are about $\frac{3}{8}$ in. x $\frac{3}{8}$ in.

3 ATTACH THE BACK FRAME

Attach the back frame to the back of the front frame with glue and finish nails. If the top or bottom of your window frame will be visible, glue filler strips into the gaps created by the rabbets at the top and bottom.

4 ADD THE TRIM

Corner trim is typical for window trim. Because our window frame is painted, we needed trim only on the face of the frame, so we used pine screen molding. Attach the trim with brad nails and wood glue. Putty the holes and sand off the excess when the putty is dry.

5 PAINT THE FRAME

Sand the entire frame with 150-grit sandpaper, easing any sharp edges. After sanding, prime and paint the frame.



SCREEN
MOLDING



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6

6 SET THE PANEL

Lay a light bead of silicone in the rabbet and set the LED panel into the rabbet. You can skip this step if your panel is snug in the rabbet and won't tip out while you're installing the window.



7

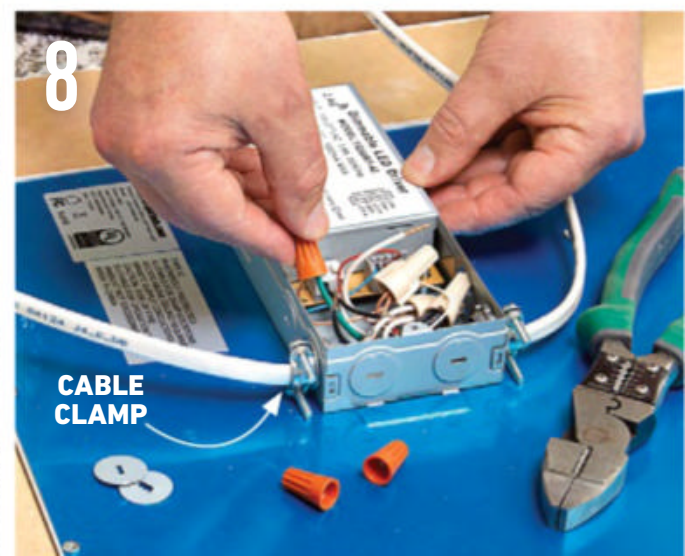
HOLE CUT
FOR LED
PANEL
WIRING
BOX

7 RUN CABLE

Once you have determined the location for your window, cut a hole in the drywall for the LED panel's wiring box. Turn off power to a nearby outlet, verifying that it's off with a noncontact voltage tester. Run NM-B cable from the outlet to the hole. Leave enough extra cable to reach from the hole to the floor to make it easy to wire the panel. To learn how to bring over power from an outlet, visit familyhandyman.com and search for "add electrical outlet."

8 POWER THE PANEL

Hook up the conductors in the cable to their corresponding terminals on the LED panel. Secure the cable to the wiring box with a cable clamp.



8

CABLE
CLAMP



9



10

9 HANG THE WINDOW

Using 3-in. trim screws, hang the window, driving the screws into the wall studs.

10 FILL THE HOLES

Fill the screw holes with wood putty or spackling. When the putty is dry, sand it flush and prime. Give the entire window a final coat of paint.

11 HANG THE BLINDS

To complete the illusion, hang blinds inside the window frame. We found that having the blinds just slightly open really sells the look of daylight coming in. 

MEET THE BUILDER



BRAD HOLDEN, THE DEPUTY PROJECT EDITOR, SAYS THIS SIMPLE LIGHTING PROJECT IS ONE OF HIS ALL-TIME FAVORITES.

11



WHAT TO DO IF YOUR BASEMENT FLOODS

THE RIGHT STEPS CAN SAVE YOU *AND* YOUR HOME

BY ETHAN O'DONNELL

In addition to being a headache, a flooded basement requires immediate attention in order to prevent further damage. And as long as you take a few precautions, you can tackle this job. So take a deep breath and follow these steps for managing water removal and quickly restoring your basement to its preflood condition.



ENSURE THE BASEMENT IS SAFE

You have a mess on your hands and of course are anxious to start cleaning up. However, before you plunge into the flooded basement with waders on and a bucket in hand, you must determine whether the location is safe to enter.

Avoid stepping into the basement if more than 2 in. of water is present throughout the entire space. Electricity and gas may pose safety issues. It is possible that the standing water has been electrified by wiring and appliances. Issues can also arise with gas-powered appliances such as furnaces or water heaters. The pilot lights may have gone out and gas may be flowing freely into the basement.

If you can access your electrical panel without getting wet, immediately turn off the power to the problem area. If not, call an electrician. Whenever you smell natural gas, immediately step outside and contact your gas provider to shut it off before proceeding.

IDENTIFY THE CAUSE AND REMOVE THE WATER

After you have determined that it is safe to begin working, focus on identifying the water source, stopping it if possible and removing the accumulated water.

Water should be shut off to broken pipes, or sump pumps should be repaired if they are faulty or floor drains are clogged. Then, using a wet vac, pump or squeegee, remove all the standing water. If the basement holds so much standing water that you must shut off the power to the whole house, you can rent a gas-powered pump at a rental store or home center to quickly remove the water.



DOCUMENT THE SCENE

Before you throw away any of your destroyed belongings, take a minute to document the damage. Taking photos of the flooded area, both inside and out, will greatly assist an adjuster if you decide to file an insurance claim. Document everything: damage to the dwelling, soaked boxes, electronics, furniture and furnishings, as well as the underlying cause of the flood.

CLEAN, CLEAN, CLEAN

If mold is present or likely, clean all vinyl or laminate flooring, solid wood, glass and concrete with a stiff-bristle brush, hot water and a household detergent. A solution of $\frac{1}{3}$ cup bleach to 1 gallon of water should be used when mold grows from overland flooding or sewage. Items such as carpet, drywall, insulation and paper that exhibit mold growth should be disposed of as soon as possible. During cleaning, avoid oversaturating the area. Be careful not to mix bleach with other chemicals, use it in a well ventilated area, and protect your eyes and skin from harsh cleaning products.

After cleaning, run a dehumidifier in the area for a couple of days. Keep an eye out for any signs of mold or mildew growth. Your eyes and nose are your most valuable assets during this time. Be



on the lookout for common black or green mold spots, as well as pink or yellow staining on drywall, vinyl wall coverings and faux wall paneling.

A musty or earthy smell is often an indication of hidden moisture damage. If mold returns, fix the moisture problem and repeat the cleaning procedure. It is necessary to wait until the affected areas are completely dry before beginning to rebuild. The process may take several days, weeks or even months.



DRY OUT BUILDING MATERIALS

Once the area has been cleared of furniture and clutter, it's time to aggressively dry out your building materials. Rent floor blowers to dry carpet (assuming the floodwater wasn't contaminated) and purchase or borrow from family and friends as many fans and dehumidifiers as possible. Make sure all walls and flooring in the affected areas are dried out. Don't forget to empty the dehumidifiers and reposition carpet blowers and fans to reduce the humidity in your basement.

REMOVE WET ITEMS

Discard waterlogged and damaged items, particularly items that support mold growth, such as paper products, unwashable linens and fabrics, and furniture.

In order to reduce dampness in a basement, remove wet furniture as quickly as possible because cushions act as sponges and absorb liquids. If you intend to salvage other wet items, you should stage them in the garage or porch in order to allow the residual moisture in the basement to decrease.

During the interim, all plastic, glass, ceramic and metal items should be removed. Once they have dried and have been thoroughly cleaned, it's safe to put them back.

Caution: Inside any dwelling, no level of mold growth is considered safe. If you are unable to eliminate the odor or you discover a mold issue larger than 10 sq. ft., get in touch with an expert for mold remediation as soon as possible.

ADAPT YOUR APPROACH WHEN MOVING BACK IN

You should keep the flooding incident in mind when you begin to move your belongings back into your basement.

Improvements such as drainage tile and sump pumps, landscaping your yard or adding a subfloor with a membrane to the concrete basement floor can all help keep your basement dry. For more information, see "Fix a Leaky Basement," p. 52.

Consider simple solutions too. Store important documents high, use plastic totes instead of cardboard boxes on low shelves, and buy aluminum or plastic furniture, rather than mold-prone particleboard. By doing this, you will save time, effort and money if your basement floods again.





BACK-BREAKING WORK REQUIRES SOME HELP

Everyone feels the hurt as you age,
but CBD can help you deal with it

By: Beth Giles

Life really does fly by. Before I knew it, my 60s had arrived, and with them came some new gifts from dear ol' Mother Nature—frequent knee pain, stress, low energy and sleeplessness. Now, I'm a realist about these things, I knew I wasn't going to be young and springy forever. But still, with "golden years" nearly on my doorstep, I couldn't help but feel a little cheated. That is until I found my own secret weapon. Another gift from Mother Nature.

It began a few months back when I was complaining about my aches and pains to my marathon-running granddaughter, Jen. She casually mentioned how she uses CBD rub to help with her joint pain. She said that CBD gave her more focus and clarity throughout the day and that her lingering muscle and joint discomfort no longer bothered her. She even felt comfortable signing up for back-to-back marathons two weekends in a row this year. That made even this self-proclaimed skeptic take notice.

But I still had some concerns. According to one study in the Journal of the American Medical Association, 70% of CBD products didn't contain the amount of CBD stated on their labels. And, as a consumer, that's terrifying!

If I was going to try CBD, I needed to trust the source through and through. My two-fold research process naturally led me to Zebra CBD.

First, I started calling my family and

friends. Call me old fashioned but I wanted to know if there were people whom I trusted (more than anonymous testimonials) who've had success using CBD besides my granddaughter.

Secondly, I wanted cold hard facts. Diving deep into the world of CBD research and clinical studies, I came across Emily Gray M.D., a physician at the University of California at San Diego (UCSD) Medical School and medical advisor to Zebra CBD who is researching the effects of CBD. Dr. Gray wrote "early results with CBD have been promising and we have a lot of research underway now. I've had several patients using CBD with good success. It's important that you know your source of CBD and how to use it properly."

After hearing it from the doctor's mouth, I returned to my research, asking more people and was amazed by the number of close friends and family who were already on the CBD train. Apparently, I was the only one without a clue! And funny enough, a couple of friends who commented were using the same brand as my granddaughter—Zebra CBD. There was no consensus as to why they were using CBD, but the top reasons given were for muscle & joint discomfort, mood support, sleep support, stress and headaches, as well as supporting overall health & wellness.

Eventually, even the most skeptical of the bunch can be won over. With a trusted CBD source in mind, I decided to give it a go.

When I viewed Zebra CBD's selection

online, I was impressed by its array of products, including CBD oils called tinctures, topicals, chewable tablets, mints and gummies. After reading on their website that all their products are made with organically-grown hemp, I ordered... and it arrived within 2 days!

The first product I tried was the Rub. Now this stuff was strong. Immediately after rubbing it on my knee, the soothing effects kicked in. It had that familiar menthol cooling effect, which I personally find very relieving. And the best part is, after two weeks of using it, my knee pain no longer affected my daily mobility.

The Zebra Sleep Gummies, on the other hand, had a different but equally positive effect on my body. To take it, the instructions suggest chewing thoroughly. This was simple enough, and the taste was, well, lemony. After about 15 minutes, a sense of calm came over my body. It's hard to describe exactly; it's definitely not a "high" feeling. It's more like an overall sense of relaxation—and then I fell fast asleep. Needless to say, I slept great and woke up refreshed. I haven't slept like that in a long time.

While it hasn't been a catch-all fix to every one of my health issues, it has eased the level and frequency of my aches. And it sure doesn't seem like a coincidence how rejuvenated I feel.

All-in-all, CBD is one of those things that you have to try for yourself. Although I was skeptical at first, I can safely say that I'm now a Zebra CBD fan and that I highly recommend their products.

Also, I managed to speak with a Zebra CBD spokesperson willing to provide an exclusive. If you order this month, you'll receive \$10 off your first order by using promo code "FH10" at checkout. Plus, the company offers a 100% No-Hassle, Money-Back Guarantee. You can try it yourself and order Zebra CBD at ZebraCBD.com/FH or at 1-888-762-2699.

BASEMENT FLOORING

THE BEST MATERIALS AND PRACTICES
FOR A MOISTURE-PRONE AREA

BY STEVE MAXWELL

When you're choosing basement flooring, style and comfort matter, but your top consideration should be how well it can handle moisture.

As a starting point, you need to determine if there are any moisture issues in your basement. Obvious sources would be leaking pipes, water heaters, laundry tubs and floor drains, but there are also less obvious ones, such as moisture coming in through the foundation.

If you notice moisture entering through the foundation, you'll likely need to address the drainage around your home's exterior. Moisture coming in through the slab is less obvious; you'll need to run a test. Your flooring installer can do this for you, or you can perform the test on p. 53. If there's a moisture problem, the concrete must be sealed before you install any type of flooring.

The flooring you choose for a basement must be rated for below-grade installation. If you're not sure, check the product information and the manufacturer's website.



MEET THE EXPERT



CHRIS SCHMITZ IS THE
MEMBER SERVICE MANAGER
AT PROSOURCE WHOLESale.



CARPET

Many people install carpet in basements because it makes the concrete floor warmer and more comfortable. That's a fine goal, but never make the mistake of installing carpet and underlayment directly on basement concrete. One reason is summertime mustiness. When humid summer air enters the carpet pile and comes close to the concrete underneath, that air can cool to the dew point, releasing fine droplets of water within the carpet or underlayment. That's why finished basements smell musty.

Always install basement carpet and underlayment on concrete that has been sealed or on top of a vapor-impervious subfloor. This will raise the temperature of the floor in winter, make your carpet more pleasant to walk on and, most important, prevent humid air from reaching the concrete and triggering mold growth. A common mistake is to install a vapor barrier on top of the carpet pad. This will trap moisture and cause mold growth on the pad or even the concrete.

Carpet tile is an excellent carpet choice for a basement. These tiles wick moisture and release it into the air. Like many luxury vinyl tiles, they're "loose lay," so they don't click together. Many are adhesive backed, but it's a special adhesive that prevents only side-to-side sliding. They can be lifted up individually for drying if they do get wet. Schmitz doesn't recommend wool or natural fabric carpets for basements, as those tend to retain moisture.

LAMINATE

In 1994, a European company called Pergo introduced laminate flooring to North America, and it has been a popular choice ever since. Today's best laminates can feature real wood veneer on the surface and resist moisture.

The durability of laminate flooring is exceptionally good if you choose one with an abrasion class (AC) rating of 3 or higher on a scale of 1 to 5. The AC rating measures the resistance of laminate flooring to abrasion. You'll also need to verify that the flooring you choose is rated for below grade installation.

Laminates require a flat floor, which can be a problem for basement installations. Most manufacturers specify no more than 1/4 in. of deviation from flat over a 10-ft. radius. Many concrete basement floors are not this flat, but it's possible to use floor-leveling compound to correct major issues. As is the case with most professional installers, Chris Schmitz says, "We don't use 'waffle-backed' subfloor tiles. A sealed slab and the recommended underlayment for your laminate is sufficient."



LUXURY VINYL PLANK AND LUXURY VINYL TILE

Luxury vinyl plank (LVP) and luxury vinyl tile (LVT) have several advantages for use in lower levels. “For basements, I recommend loose-lay flooring that doesn’t click together. The flooring pieces simply butt together. If this flooring does get wet from above or below, you can lift out individual tiles or planks to let the area dry and then set them back in place. Also, because the pieces are just butted together, they’re not waterproof, meaning moisture won’t become trapped below the flooring,” says Schmitz.

LVP and LVT are extremely durable. Both are made from the same materials, differing only in the shapes of the pieces: Planks are rectangular and tiles are square.

These types of vinyl flooring are flexible enough that they don’t need a super flat surface as laminates do, which means they can easily lay over some undulations in a concrete floor. Unlike click-together vinyl floors, there’s no expansion gap left at the walls. Instead, the tiles or planks depend on a close “compression fit” to stay in place. Also, each piece has a backing that prevents it from sliding.

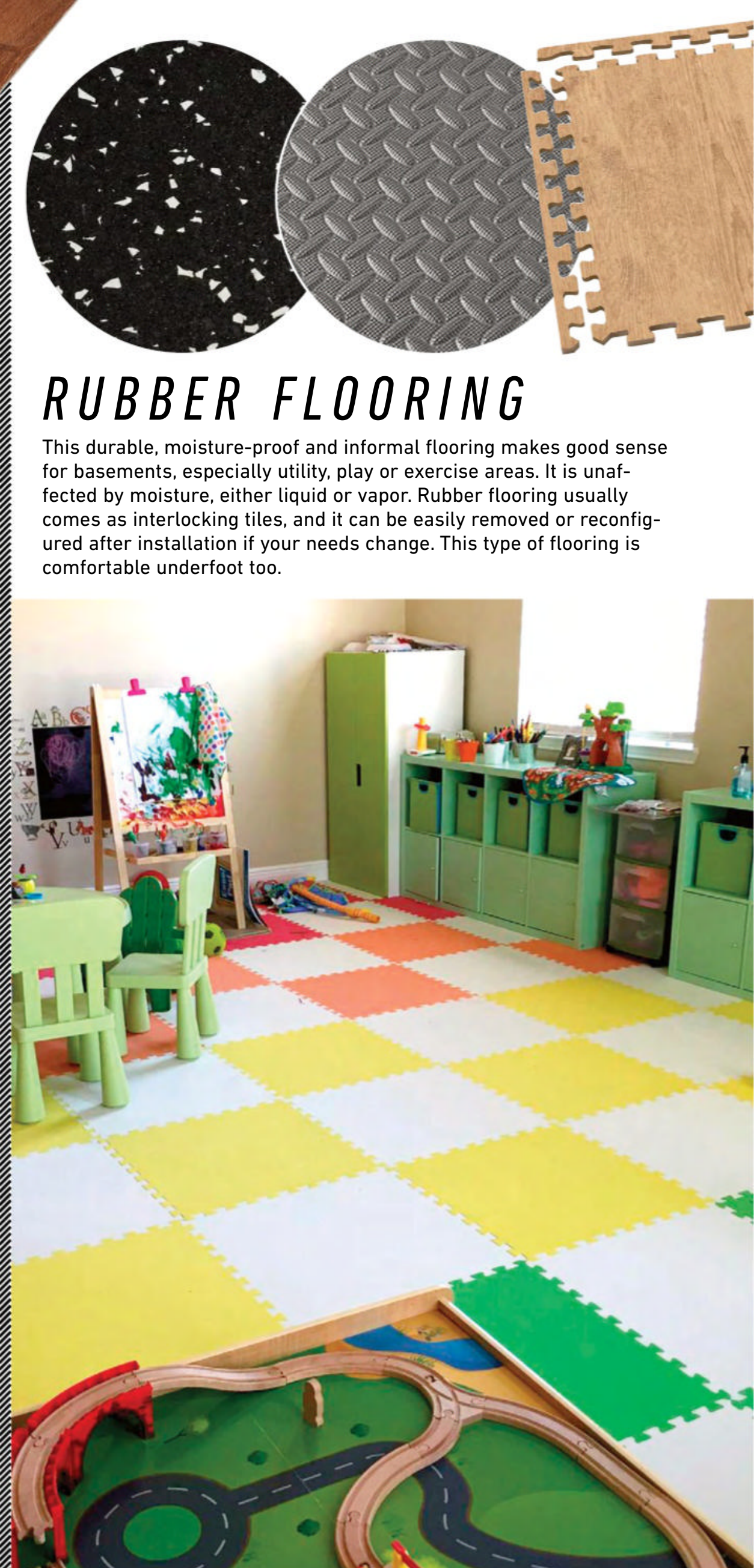
LUXURY
VINYL TILE

NO-SLIDE BACKING

MAIN PHOTO AND THREE SWATCHES COURTESY OF LL FLOORING

**LUXURY
VINYL PLANK**

SWATCHES LEFT TO RIGHT: GREATMATS.COM, WE SELL MATS, WE SELL MATS, WE SELL MATS; MAIN PHOTO COURTESY OF GREATMATS.COM



This durable, moisture-proof and informal flooring makes good sense for basements, especially utility, play or exercise areas. It is unaffected by moisture, either liquid or vapor. Rubber flooring usually comes as interlocking tiles, and it can be easily removed or reconfigured after installation if your needs change. This type of flooring is comfortable underfoot too.

This durable, moisture-proof and informal flooring makes good sense for basements, especially utility, play or exercise areas. It is unaffected by moisture, either liquid or vapor. Rubber flooring usually comes as interlocking tiles, and it can be easily removed or reconfigured after installation if your needs change. This type of flooring is comfortable underfoot too.





CERAMIC AND PORCELAIN TILE

These tough, attractive, hard-wearing options are perfect for basements. “It’s commonly believed that you should install basement floor tile on an uncoupling membrane to prevent tile from cracking as the concrete expands and contracts. This may be a good idea if your home is relatively new, as the concrete may still settle or move a bit, but if your home is 10 years old or more, that shouldn’t be an issue. Properly installed, tile can be applied directly to the concrete without risk of cracking,” says Schmitz.

One downside of tile is that it’s cold to walk on. If you choose tile for a basement in a cold climate, Schmitz recommends installing electric heat cables. This will turn the tile into a radiant thermal mass, making your basement much cozier. 

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STAIRCASE BONUS SPACE

////
FIVE CREATIVE WAYS TO USE IT!

BY JAY CORK

In most multistory houses, the space under the stairs is enclosed and unused. But with a little time and creativity, you can turn that wasted space into something special. Here are five ideas to inspire you.

WINE STORAGE

If you have a wet bar in the basement (or one on the way), consider building wine storage into your staircase. It's a beautiful project and frees up space in your bar or, depending on the size of your collection, maybe even an entire room.

1 START WITH THE CASEWORK

Build this wine rack as you would a fixed shelving unit, using $\frac{3}{4}$ -in. plywood for the casework and shelves. Assemble and install only the casework—it will be much lighter to handle. Trim to match your style and apply the finish.

2 MAKE THE RACKS

It's easiest to attach the dividers before the shelves are installed. With a $2\frac{1}{2}$ -in. wide piece of scrap wood to space the dividers evenly, use a brad nailer to attach them to the shelves. Install the shelves with pocket hole screws.

3 TRIM IT OUT

Trim the wine rack with a style that matches your space. Frame it with a wide base trim to create a bold look. For jobs such as this, I like to use chair rail for a unique look.



3/4" x 3/4"
DIVIDERS

MEET THE EXPERT



JAY CORK USED TO LIVE UNDER THE STAIRS IN HIS PARENTS' HOUSE—WHICH MIGHT EXPLAIN A LOT.

SIMPLE SHELVING

This easy upgrade to an under-stair space adds both function and style. Recessed shelves don't require any structural changes to the wall or staircase. You can trim each shelf or just paint them to blend into the drywall as shown.

1 SIMPLE BOX CONSTRUCTION

The recessed shelf detail is easy to make—just assemble open-faced boxes to fit within the stud cavity using ½-in. plywood or MDF. Mark the stud locations and cut the openings in the drywall. Install the boxes flush to the drywall and apply trim.

Pro Tip: Whether you're painting or staining, finish the shelf boxes before installing them.

2 ADD ADJUSTABLE SHELVES

Increase storage and functionality with adjustable shelves. This can be done before installation or later as your needs grow. Use a shelf pin jig to drill the shelf pin holes accurately on both sides of the box. Cut the shelves ¼ in. narrower than the internal dimensions and finish the shelves to match the shelf box.

PET LOUNGE

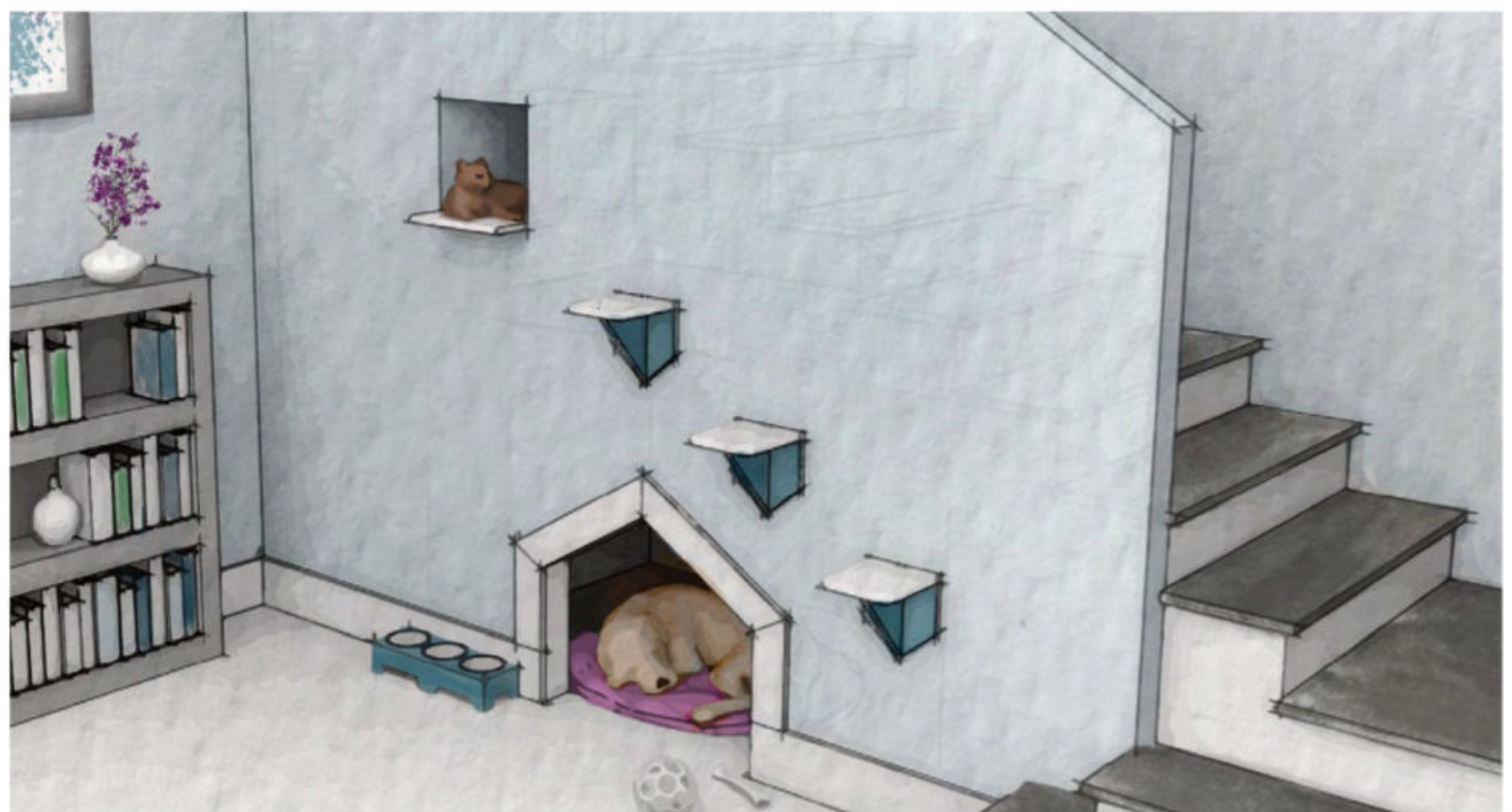
What better way to show some love for our pets than to make a space just for them! A dog just wants a bed of its own, and cats just want to reinforce their superiority by sitting higher than anyone else in the room. This plan suits both!

1 A DOGHOUSE

You can simply cut a door into the wall, or frame out an entire under-stair hideaway for your buddy. Add a dog pillow for creature comfort, plus bowls for food and water, then your pup will have a room to call its very own.

2 ADD A CAT PERCH

This cat perch is easy. Make a 14½-in. square box to fit between the studs, cut away the drywall and screw it in. Trim it to match the style of your room. Your feline will love running up the carpeted, L-shaped steps to its perch. Position the steps over the studs for maximum strength.



HOME OFFICE SPACE

With more people working from home, the need has increased for a space to serve as “the office.” Unfortunately, this is often the kitchen table, the couch, a spare bedroom or, worse yet, our actual bedrooms! Let’s be done with that! Convert unused space under a staircase to a small but functional home office complete with a work surface, filing cabinets, shelves and a task light.

1 INSTALL A WORK SURFACE

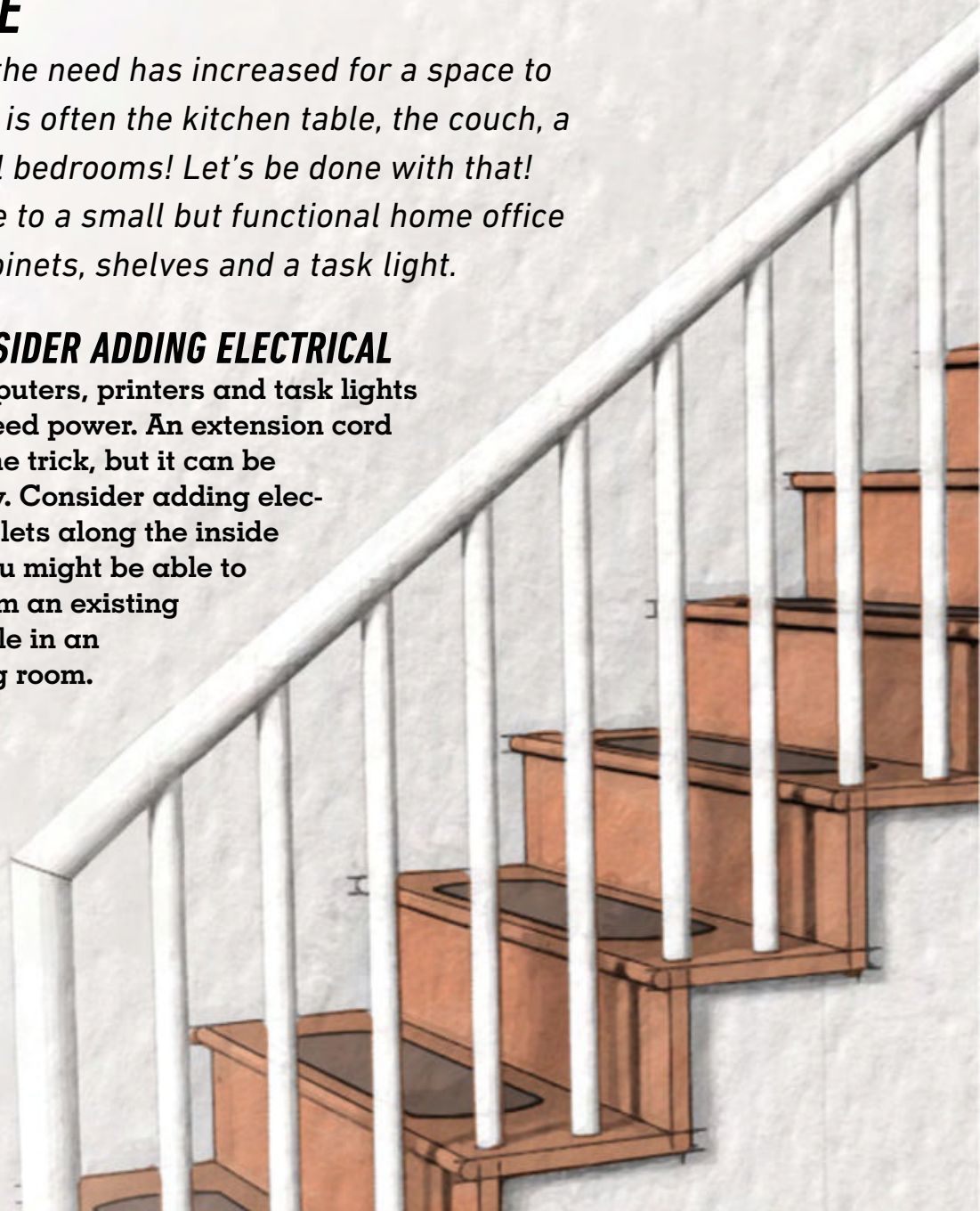
Design the space around an existing desk or design a desk to fit the existing space. A work surface is easy to make with particleboard and plastic laminate. Anchor it to the studs and it will be strong enough to stand on!

2 ADD CABINETS AND SHELVES

Add filing cabinets and shelves to fully outfit your new work-at-home digs. Store-bought filing cabinets with two drawers are typically 30 in. tall. Make sure they will fit under your work surface.

3 CONSIDER ADDING ELECTRICAL

Computers, printers and task lights all need power. An extension cord will do the trick, but it can be unsightly. Consider adding electrical outlets along the inside wall—you might be able to draw from an existing receptacle in an adjoining room.





DAYBED READING NOOK

This nook with a daybed is a perfect hideaway for alone time with a glass of wine and your favorite book. It can also double as a guest bed for kids' sleepovers. It's like adding an entirely new room without nearly as much work.

1 ADD SHELVES

You know that teetering stack of books on your nightstand? You can move a few down here if you add shelves to the side wall. Build them into the stud wall and finish them with drywall for a clean look. A small nook on the back wall is perfect for a cup of coffee or tea.

2 STORAGE FOR MORE THAN BOOKS

In addition to the space for books along the front of the bed, the area underneath the mattress can also be used for blankets and pillows. 

FIX A LEAKY BASEMENT

THESE STRATEGIES WILL HELP YOU DRY IT—PERMANENTLY

BY JEFF GORTON

If your basement leaks when it rains or is damp and smells musty in the summer, don't throw in the towel.

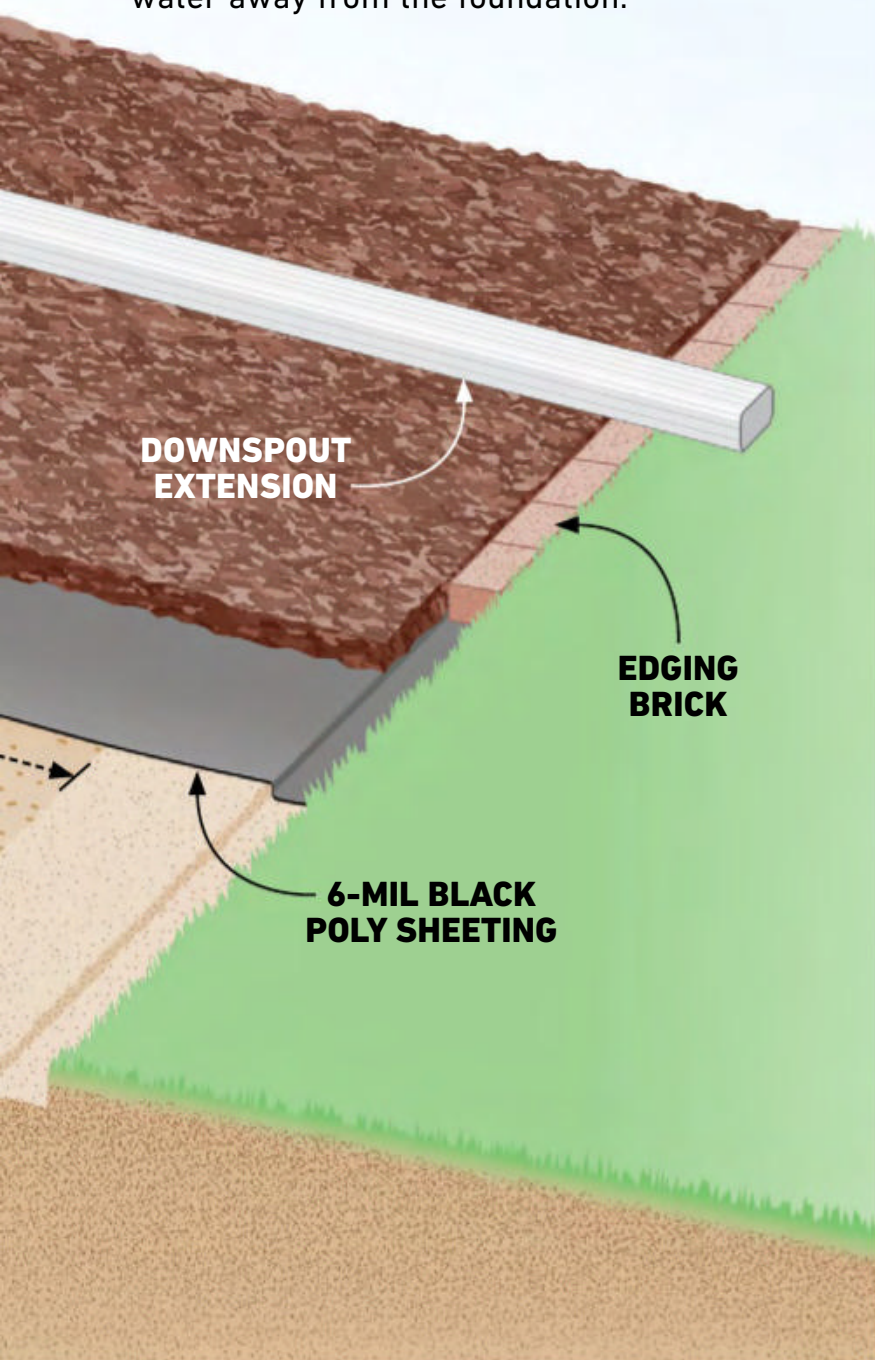
There are all kinds of ways to dry a wet basement, ranging from simple weekend fixes to more difficult repairs that you may want to hire a contractor to do.

In this article, we'll show you how to diagnose your wet basement problem and give you solutions to try yourself. We won't go into detail on how to complete some of the more difficult jobs, such as installing an interior drainage system, but we'll show you how they work and what's involved in their installation.



INSPECT YOUR FOUNDATION AND TAKE NOTES

It's important to do a thorough check of the ground around your foundation. For this you'll need a 4-ft. level, a tape measure and a notepad. First draw a simple sketch of your house and yard. Then use the level to check the slope of the ground around your foundation. Look for areas of sunken soil, garden beds with edging that protrudes to form a dam, and ground that slopes toward the house. Make notes on your sketch with arrows to show which way the ground slopes. This step will help you develop a plan for redirecting the water away from the foundation.



DETERMINE WHERE THE WATER IS COMING FROM

Water or moisture gets into basements through two sources. One is indoor humidity that condenses on cold surfaces, such as the sweat on a cold glass of lemonade on a hot and humid day. The other main source is water—or water vapor—coming in from the outside. Rainwater, melting snow or groundwater can saturate the soil around your foundation and leak in. Water can leak through cracks in the foundation or walls, or it can penetrate porous concrete or masonry walls in the form of water vapor.

To help you diagnose the problem, tape aluminum foil to your basement wall and inspect it a few days later. Moisture on the outside surface of the foil indicates high indoor humidity. Moisture behind the foil means moisture is leaking through the walls.



GET RID OF EXCESS HUMIDITY

Eliminate the sources of humid air. Seal leaky dryer vents with foil tape to prevent unwanted humid air from entering your basement. Don't just use duct tape; it'll eventually fall off.

Add a vent fan to your basement bathroom and make sure your family members turn it on during showers. Keep your basement windows closed during humid weather. And if you're still getting condensation on cool surfaces, run a dehumidifier to lower the indoor humidity.



HYDRAULIC CEMENT

PLUG HOLES AND CRACKS IN THE FOUNDATION

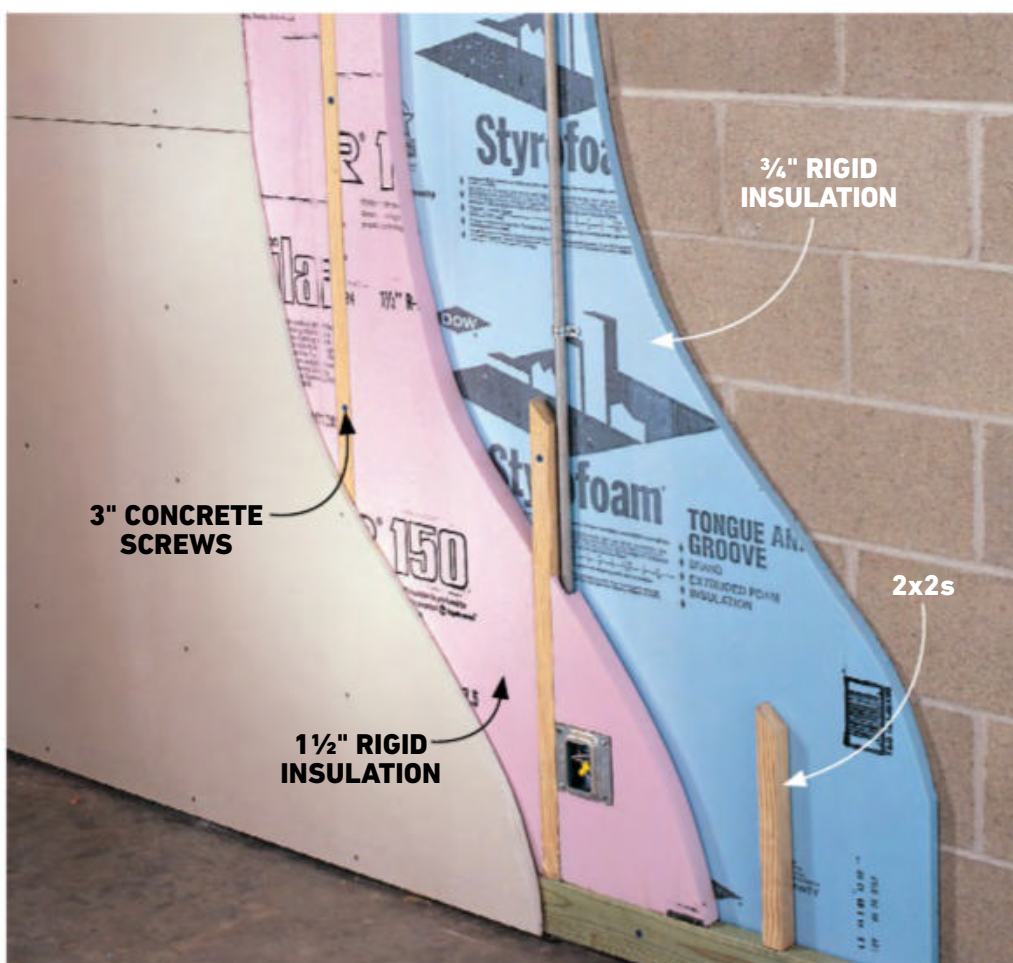
Not all foundation cracks are created equal, so it's important to identify cracks that can contribute to leaks. Plugging them probably won't solve basement leaks, but it'll help. Hydraulic cement works great for this because it can set up even under water, and it expands as it sets to seal the hole and lock the plug in place.

Use a cold chisel or an angle grinder fitted with a masonry-cutting disc or diamond blade to enlarge the hole or crack into an inverted V, with the point of the V on the surface of the wall. Follow the package instructions for mixing and using the hydraulic cement.



INSTALL A SUMP PUMP

A flooded basement can cause expensive water damage and even be a health hazard. A sump pump transfers water from your basement to a place it can drain safely. Sump pumps must be installed at the lowest level of the floor. They don't have to be in a pit, but digging a pit in the basement floor is usually the best option. The pit is typically lined with a prefabricated plastic basin with a cover. Depending on the height of the water table, a submersible pump is installed in the pit or a pedestal pump is installed on the basement floor.



INSULATE BASEMENT WALLS

Insulate exterior walls to prevent condensation. In cold climates, insulating basement walls also saves energy and reduces your heating bill. But don't cover the walls with insulation if water is leaking in from outside; you'll just create a potential mold problem.



WATERPROOF COATING

WATERPROOF BASEMENT WALLS

Paint-on waterproofing materials fill the pores in the concrete or masonry walls and prevent water from leaking in. To be effective, these coatings must be applied to bare concrete or masonry walls. Start by removing loose material with a wire brush. Then clean off any white powdery "efflorescence" with masonry cleaner.

Follow the safety and application instructions carefully. A common mistake when using masonry waterproofing products is to spread them too thin. The goal is to fill every pinhole to create a continuous waterproofing membrane. Brush the coating in all directions to completely fill every pinhole. Add a second coat after the first dries.



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INSTALL A DRAINAGE SYSTEM

The best permanent fix for chronic basement leaks is to install drainage tubing below the basement floor and to connect it to a sump basket and pump. You can install a system like this yourself, but breaking out the concrete floor, burying the tubing and patching the floor is a lot of backbreaking work.



FOAM INSULATION

INSULATE PIPES

Condensation can build on cold pipes, leading to dripping and more basement water problems. Cover cold water pipes with foam pipe insulation to stop condensation. The foam insulation is inexpensive and easy to cut with scissors. It also helps prevent pipes from freezing in the winter, which can cause serious flooding problems.



DOWNSPOUT EXTENSION

ADD GUTTERS AND DOWNSPOUT EXTENDERS

If your basement leaks after it rains and you don't have gutters, consider adding them. Gutters catch the rain and channel it to the downspouts, which direct it away from the house. Whether you're installing new gutters or already have them, be sure the downspouts have 4- to 6-ft. horizontal extensions to move the water away from the house. 

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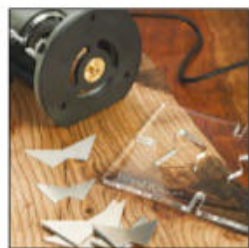
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BEST PRO TIPS

 EXPERT ADVICE FROM THE JOB SITE

INSULATE WITH FOAM

IT'S A GREAT
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BY MARK PETERSEN

Closed-cell polyurethane spray foam has some outstanding qualities—it has a high R-value, it expands into hard-to-reach areas, and it's resistant to water, mold and insects. Heck, it can even add structural support.

However, it is expensive, so we spoke with a couple of manufacturers and some pro insulators about where and when to use it, when to call in a

pro with a truck-mounted unit, and when a DIY kit is the best option. We also assembled some great installation tips to help you spray safely and get the best value for your investment.

We used the Froth-Pak Insulation 210 two-component, low-pressure kit. It has an R-value of 6 per inch.

MEET THE EXPERT



BOB TEMPLIN WORKS FOR CITYWIDE INSULATION IN SHAKOPEE, MN. HE HAS BEEN IN THE INSULATION BUSINESS FOR OVER 35 YEARS, STARTING LONG BEFORE SPRAY FOAM INSULATION BECAME MAINSTREAM.



FOAM IS MEASURED IN BOARD FEET

Most two-part spray foam kits have a number assigned to them: 120, 200, 210, 600, etc. That number usually indicates how many board feet the foam will cover. So, a 200 kit will cover 200 sq. ft. at 1 in. thick.

SEALANT VS. INSULATION

Closed-cell spray foam sealant looks just like foam insulation, but it's not the same thing. Sealant is formulated to seal cracks and voids, or the perimeter of stud spaces before you install fiberglass insulation. Sealant should not be used to fill larger cavities because it loses its fire-retardant properties when applied in thick layers.

OPEN-CELL VS. CLOSED-CELL FOAM

Two kinds of spray foam are available: open and closed. Closed-cell foam costs more than open-cell, but the properties of closed-cell make it more popular. It's more resistant to water and can provide an air and vapor barrier (depending on the thickness). It also provides nearly double the R-value per inch over open-cell.

Open-cell insulation has one superior property over closed-cell foam—it works great as a sound barrier. It's often used under stairs and between walls and floors for that reason.



WEAR THE PROPER GEAR

Protect your lungs with a respirator and be sure to wear a full protective suit, chemical-resistant gloves and wraparound goggles. Tape your gloves to your sleeves and wear your junkiest shoes. Acetone will dissolve fresh foam right away, but once the foam cures, it must be physically scraped off. If you don't want something covered with foam spatter, cover it or keep it away from the action.

TRUCK VS. KIT

Most insulating pros with truck-mounted units have a minimum charge that can be in the thousands, so buying a spray foam kit makes sense for small jobs and for when you need to insulate in stages over the course of a few days or weeks. Kits are also handy for insulating jobs in remote locations far from a spray foam company. You can buy kits that produce foam with the same R-value as the foam sprayed from truck-mounted units (just under R-7).

For large jobs, it makes sense to hire a pro because the cost will be considerably less than if you use a kit yourself. You'll also want to call in a pro if the weather is cold. Truck-mounted units have built-in heaters, which can spray foam at close to freezing temperatures. Kits require ambient and surface temps to be 65 degrees.

Keep in mind that a house will have to be vacated for up to 24 hours if a truck is called in, but many of the kit products allow you to inhabit the house immediately after spraying.

MAKE A PLAN BEFORE YOU PULL THE TRIGGER

Long before you don your safety gear, plan your work. (1) Clear the room of everything that could get in the way. (2) Mask everything else. (3) Decide which areas you'll spray first. (4) Place ladders or step stools where you'll need them. (5) Set up a fan or two to vent the fumes outdoors.

Before you start, shake the cans to mix the contents, and then shake them every few minutes after that. You'll have to install a new tip every time you stop spraying for more than 30 seconds—the foam sets inside the nozzle and clogs it. Spray foam kits come with extra tips, but it's a good idea to purchase more.



HAMMER TACKER

MASK WINDOWS AND DOORS

Use a hammer tacker to staple plastic to the framing around windows and door frames. Don't worry about covering gaps between the windows and the framing because you'll want to fill those with low-expanding canned foam specifically designed for windows. Cover all the switch and outlet boxes with masking tape so they don't fill with foam.

PRO TIP: When you insulate exterior walls with foam, you don't need to use gasketed electrical boxes as you would if you were insulating with fiberglass—the foam will air-seal around the boxes.



CONSIDER SMALLER KITS

Three 200 kits will cost more than one 600 kit, but the 600 kit will have larger tanks that require two hands to be moved around—not easy to do if you're working alone!

CHARGE THE LINE

Before installing the first tip/mixing nozzle, point the gun into a garbage bag or empty box. Pull the trigger until both chemicals are flowing evenly.



PETROLEUM JELLY

LUBE THE GUN WITH EVERY TIP CHANGE

The end of the gun needs to be lubricated before the first tip is installed and again before the tanks are stored after use. Many pros prefer to lube the tip of the gun every time they install a new tip. Kits will come with petroleum jelly lubricant. Always follow the manufacturer's instructions on operation, tip changes, storage and disposal.



NEVER SPRAY A WET SURFACE

Never spray foam on a surface with a moisture level of more than 20%—the foam won't stick. If you're patching a wall that recently sustained water damage or was recently assembled with new wet lumber, test the moisture level before you spray. You can get a basic moisture meter at some home centers or online for less than \$40.

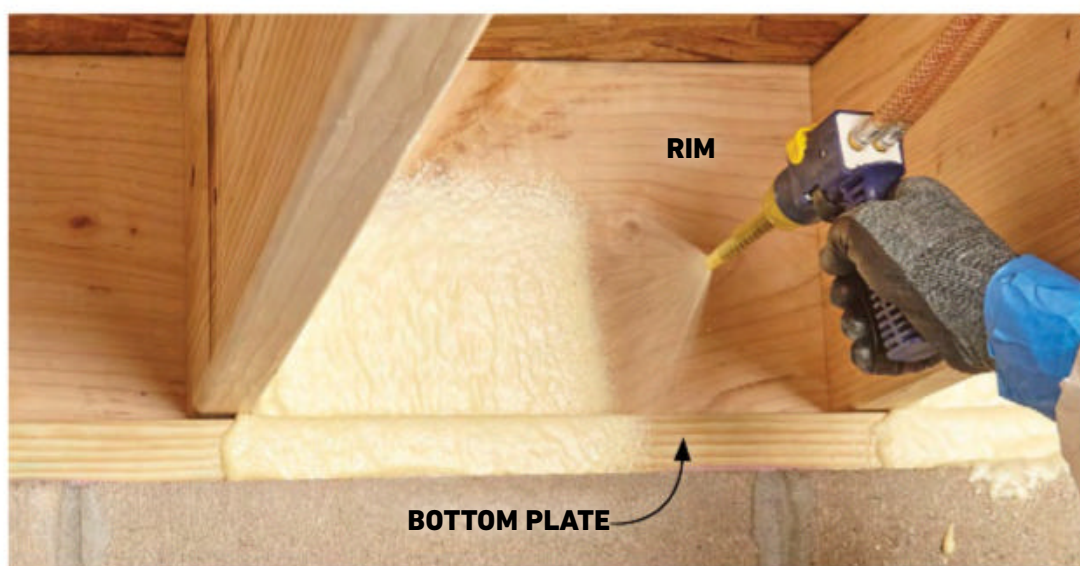


SPRAY 2-IN. LIFTS AND WAIT

The two most common spray foam installation mistakes are failing to wait for lifts to cure and spraying lifts that are too thick. Always wait a few minutes before spraying additional lifts, and never spray a lift more than 2 in. thick. The foam needs time to cure before being covered with another lift. Uncured foam results in reduced R-values. The allowable thickness of lifts varies by manufacturer, so do your homework.

PICTURE-FRAME FIRST

Before filling the wall cavity, spray the perimeter with a ½-in. layer, which will expand to a 1-in. layer. These layers are called lifts. This will ensure that the foam penetrates any voids where the studs meet the sheathing and reduce the risk of bulging. If foam is sprayed into a large gap between the stud and the sheathing and then immediately covered by a thick layer, the pressure of the expanding foam can cause sheathing that isn't securely fastened to bulge out. Wait a few minutes after picture-framing the cavity before you go back and lay down the first layer in the center of the wall.



SPRAY THE RIM AND THE BOTTOM PLATE

A foam sill sealer is needed between the bottom plate and the concrete foundation wall. Voids in the wood or concrete or tears in the sill sealer can create gaps where air and insects can penetrate. While you're sealing the rim board, cover the bottom plate and top off the concrete as well. There's no need to picture-frame the joist spaces before filling them, but don't spray a lift more than 2 in. thick.

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DON'T LEAVE FOAM INSULATION EXPOSED IN LIVING AREAS

To comply with building codes, spray foam insulation cannot be left exposed in living areas. It needs to be protected by a thermal barrier such as drywall. Rim joist cavities are one exception. They can be sprayed with foam and left exposed if the foam is less than 2 in. with a Class A fire rating.

Foam can be left exposed in nonliving areas such as attics and crawl spaces that are not used for storage, but the foam must either have a Class A rating or be covered by an ignition barrier such as drywall, mineral fiber insulation or a special spray-on coating. Fire and smoke specs differ among manufacturers, so always consult your local building official to confirm which foam you can use and where.



TEST THE DEPTH WITH A CHOPSTICK

It's important to know how thick the foam is, but it can be difficult to judge, especially in rim joist spaces. You could buy a fancy pin depth gauge (not shown), or you could wrap a piece of tape around a chopstick at your desired depth and use it for testing.



START AND STOP AT CABLES AND PIPES

Don't blast over pipes and cables on the first lift. Instead, shoot some foam underneath them at the same time you're picture-framing the stud cavities. This will ensure that the foam doesn't wrap over the cables and leave an uninsulated void behind the pipes or cables.

COMBINE FOAM WITH FIBERGLASS

Fiberglass insulation can be used in conjunction with spray foam. The process is called "flash and batt." Just picture-frame the wall cavities and lay down one lift. Then fill the rest of the cavity with fiberglass insulation. This is a popular way to save money but still takes advantage of the outstanding air-sealing properties of closed-cell foam.

For 2x4 stud walls, the fiberglass insulation will have to be split to fit. In this case, we sprayed just under 2 in. of foam (R-10.8) and split 3½-in. R-13 batts in half (R-6.5) to achieve an R-17.3 insulation value. Never cram oversize batts into a wall cavity because fiberglass insulation loses R-value when it's compressed. 



SCRAPE OVERSPRAY WITH A CURRY COMB

Run a straightedge along the outside of the studs and scrape down any high spots with a curry comb. Remove large chunks of foam with a hand-saw. Curry combs are designed to groom horses and are available online or at farm supply stores for less than \$20.

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DOES LIGHTING YOUR PROPERTY MAKE IT SAFER?

Humans tend to fear what lurks in the dark, so it's only natural that our survival instincts bend toward illuminating our property. But does copious lighting really keep intruders away and make your home safer? It depends.

"The most common misconception is that more light means less crime, but that is not supported by the data," says Lt. Ryan Darr, who oversees criminal investigations at the Flagstaff, Arizona, Police Department. "Lighting can illuminate a potential target just as easily as it allows a legitimate user to see a potential threat or criminal."

More than two decades ago, Flagstaff was recognized as the world's first certified International Dark Sky City for its pioneering work to balance preservation of the night sky with concerns about public safety and economic security. The city police partner with experts such as Christian B. Luginbuhl, the president of the Flagstaff Dark Skies Coalition, to improve safety while mitigating light pollution.

Luginbuhl says there's no consensus among scientific studies examining light and crime.

"Sometimes lighting may decrease crime; sometimes it may increase it," says Luginbuhl. "The U.S. Department of Justice has concluded that the benefits of lighting are uncertain, even though many feel quite [unjustifiably] certain of the benefits."

HOW MIGHT LIGHTING MAKE A PROPERTY LESS SAFE?

Lighting intensity, placement and complementary security measures are more important than your quantity of light. Common lighting mistakes include:

■ **BRIGHT LIGHTS:** These constrict our pupils, preventing us from seeing what's in the shadows. "If you stick a light on the side of a building that shines in your user's eyes, it may actually make it more difficult to see if there is danger there," says Darr.

■ LIGHTING WITHOUT

SURVEILLANCE: This lets potential intruders see without turning on their flashlights, which might otherwise draw attention. "In fact, good lighting without surveillance may actually encourage criminal activity in some cases," says Darr.

■ **EXCESSIVE AND MISDIRECTED LIGHTING:** If it shines sideways or upward, it actually decreases visibility and creates a false sense of security. That may make people behave more carelessly.

"It's usually smarter to think about other more obvious ways to protect yourself or your property against crime," says Luginbuhl. These include locking your doors and walking at night with a companion.

And here's one more cost-free way: "Fostering community relationships where people watch out for each other, rather than close their windows and shades against the night," he says.

BY KARUNA EBERL

MOST EFFECTIVE WAYS TO USE LIGHTING TO DETER CRIME

Excessive lighting is detrimental, but well-planned lighting is vital to home security. Our experts offer these suggestions:

■ **USE MOTION-ACTIVATED**

LIGHTS: These can effectively spook any would-be intruder.

"They can also be a helpful tool when bringing in groceries from the car at night or taking out the trash," says Shane Roberts, product marketing manager at Vivint, a home security company.

■ **POSITION PRIMARY LIGHTS**

OUT OF REACH: "Then no one can tamper with them," says Officer Mitch Trujillo of the Boulder Police Department in Colorado.

■ **CHOOSE INTERACTION:**

Lighting can interact well with security cameras and devices.

■ **PUT FLOODLIGHTS ON A**

MOTION SENSOR: These also light up dark corners around your

house. "Be sure to install them so they don't illuminate higher than the eaves of your house and are in areas that won't keep you or your neighbors up, like entryways, porches, garages and the sides of your home," says Mallory Micetich, a home care expert at Angi.

■ **INCREASE EFFECTIVENESS**

WITH AUTOMATION: Program lights to come on at various times of day or night to create the illusion someone is home.

Apps such as Vivint's Spotlight Pro offer remote control of your lights and their orientation. You can shine spotlights and strobes on people lingering too long.

■ **USE LOW-POWERED LANDSCAPE LIGHTING:**

This helps illuminate grounds otherwise cast in shadow.



■ **SHINE LIGHTS DOWN:** Target the areas you and your guests normally use. "Never point lights up into the sky," says Darr.

■ **DON'T SHINE LIGHTS**

SIDEWAYS: The increased glare will make it harder to see in the harsh shadows created.

■ **PLACE LIGHTS AT THE MAIN**

POINTS OF ENTRY: Think about front and back porches, windows, pathways, garages and driveways, according to Roberts.

■ **LESSEN LIGHT POLLUTION:**

Choose warm-spectrum colors with lighting pointed downward and shielded on the top and sides. Install lights only where necessary and set them at the lowest brightness.

"We also do not suggest lighting areas you don't want people to use at night," says Darr.

"If you have a pathway that goes through an open space or forested area and it is isolated and dangerous to travel at night, putting up lights just provides people with a feeling that they should walk that way and might put them at even more danger. If only the criminal is watching an area, providing lights only assists them in choosing a target."

PROBLEMS WITH EXCESSIVE LIGHTING

Our country uses lots of extra lighting, and 99% of it serves no clear purpose, according to a recent report from the Department of Energy. Besides safety concerns, too much lighting creates a host of other problems, such as:

■ **EXPENSE:** All those watt-hours add up. Plus, installing an outdoor lighting setup can cost \$2,000 to \$4,500, according to Micetich.

■ **WASTED ENERGY:** Consuming excess electricity produces unnecessary carbon pollution.

■ **NEIGHBORHOOD**

DISCOURSE: If your lights shine in your neighbor's yard, it can aggravate them while creating a hazardous situation on their property. "It can be nice to check in with your neighbors to make sure your outdoor lighting setup isn't impacting them," says Trujillo.

■ **LIGHT POLLUTION:**

Excessive light blocks out the night sky. "Not only astronomers and scientists enjoy looking at the stars and planets," says Darr.

■ **HUMAN HEALTH:** Nighttime lights interrupt our sleep cycle. We're only beginning to learn the range of consequences, but one is an increased risk of cancer.

■ **ECOSYSTEM HEALTH:** Light harms animals, because more than half of species are nocturnal. It also harms migrating birds and even trees.

■ **HAPPINESS AND**

CREATIVITY: Dark, starlit nights give us a feeling of universal connection. They inspire us to create art like Vincent van Gogh's painting *The Starry Night*. Excessive lighting robs us of those nights.

OTHER VITAL STEPS TO DETER CRIME

"Lighting is a powerful tool," says Darr, "but by itself it does not prevent crime."

Lighting works best in conjunction with other tactics, such as surveillance, locking doors and windows, installing a home security system, and consulting local home security experts and landscape lighting designers. Some police departments, especially those trained with the Crime Prevention Through Environmental Design program, can help.

Finally, Darr recommends knowing your neighbors. "Places that encourage their residents to watch out for each other's property and also have security or surveillance cameras see a much lower chance of being victimized by crime," he says.



9 ALTERNATIVE USES FOR SAWDUST

Every fully stocked wood shop has a table saw. You can usually find a pile of sawdust under it, even if it's used only occasionally. If a shop has a belt sander or band saw, there's probably another pile of finer sawdust under that. Even people without stationary tools have sawdust accumulation on their workbenches.

Sawdust recycling may not be the first thing on the mind of DIY woodworkers, but it's a priority in large industrial shops. Because it's the main ingredient in particleboard, medium-density

fiberboard (MDF) and composite wood products, sawdust is a valuable resource to be carefully collected and sold. Small-scale woodworkers may not produce enough sawdust to sell, but that doesn't mean they should throw it away.

Of course, virgin sawdust from solid, untreated wood is the most valuable and versatile. It comes in handy in the shop, in the garden or around the house. Sawdust from engineered wood products like plywood, oriented strand board (OSB), MDF, particleboard or pressure-treated wood is toxic and shouldn't be used around plants or animals, but that doesn't make it useless.

Next time you sweep the shop floor or dust off your workbench, save that pile of sawdust. Here are some of the things you can do with it.



1. PREVENT SLIPS IN THE WINTER

Sawdust is a safe, noncorrosive salt alternative you can spread on icy walkways or driveways to provide traction. If there is vegetation nearby, use only nontoxic sawdust from non-engineered wood to avoid poisoning plants. When winter is over, the sawdust will decompose readily in higher temperatures.



2. KILL WEEDS

If you have any black walnut, you've got the makings of an effective weed killer. Spread black walnut sawdust on cracks in your walkways or driveway, and let the natural oils from the wood soak in. It'll kill the weeds. Don't use black walnut sawdust anywhere else in your garden, however; it will do the same thing to your plants.



3. DISPOSE OF OLD PAINT

Can't figure out what to do with those old paint cans with only a little paint left in them? It's illegal to throw them in the trash as they are, but if you pour in enough sawdust—treated or untreated—it will soak up the paint and harden. You can then chip or scrape out the paint/sawdust mixture, safely throw it into the trash and reuse the can.



4. CONSIDER RECYCLING SAWDUST AS COMPOST

Sawdust has a high carbon-to-nitrogen ratio, making it a good substitute for dry leaves or whatever "brown" matter you toss in with your leafy greens to provide a good compost mixture.

Chemically treated sawdust shouldn't be put in a compost tumbler. But if you have a pile in the yard, you can leach the chemicals out of the mixture by dousing the pile with water a few times during the summer. Untreated sawdust is also an inexpensive, effective additive for composting toilets.



5. USE IT FOR YOUR PETS

Nontoxic sawdust from nonengineered wood is fragrant and absorbent. Use it in several ways to make life easier for your pets. Not all woods are safe for every animal, so check with your veterinarian.

- Substitute sawdust for cat litter. It isn't flushable, but you can bury used sawdust litter in the ground without hurting the environment.
- Spread it as a bed for your pet guinea pigs or rabbits. Use it for bedding for chicken coops and horse stalls.



6. STORE ROOT CROPS

In the days before refrigeration, people stored carrots, potatoes, parsnips and other root crops in cold soil. Untreated sawdust can make a lightweight substitute.

Spread a layer of sawdust on the bottom of a wooden or cardboard box. Arrange the vegetables so they aren't touching one another, then fill the box with sawdust and store it in a cool place.



7. CLEAN UP SPILLS AND DUST

Here's another great use for chemically treated sawdust: Spread it on the floor to soak up spills. Wood fibers effectively absorb oil or paint spills in the garage, and it also soaks up pet urine and vomit. If you add some baking soda, the mixture will also deodorize. To clean a dirty or dusty floor, moisten some sawdust, spread it, then sweep it up.



8. MAKE YOUR OWN FIRE-STARTING BRICKS

You could also compress nontoxic sawdust into bricks, then throw them into the wood stove or fireplace as kindling. Mix the sawdust with water, compress it into a brick mold and let the bricks dry in the sun.

Another way: Moisten the sawdust, let it stiffen overnight, then form it into balls with your hands and dry it in the sun. Add a little melted paraffin or candle wax and lint from the dryer to make the bricks or balls easier to light.



9. DIY WOOD FILLER

Mix the fine dust that collects in the bag of an orbital or belt sander with shellac to make wood filler. Avoid the common mistake of adding white carpenter's glue—that will turn the mixture into gray mush. Using shellac allows the filler to take stain and polyurethane. Wood glue doesn't allow this, so the filler ends up a different color when finished.

One advantage of wood filler made from sawdust: It has wood's natural color. To preserve that, apply a clear resin-like lacquer or polyurethane. For a super-strong filler, go with epoxy.



CHRIS DEZIEL CONTRIBUTING WRITER

DOUBLE THE LIFE OF YOUR WATER HEATER

A water heater needs to be flushed at least once a year to remove sediment on the bottom of the tank. That's especially true if you have hard water. This task is easy to blow off, but skipping it is costly. The buildup reduces the heater's efficiency and causes premature failure.

One sign of excessive sediment buildup is a popping or rumbling sound caused by steam bubbles percolating up through the muck.

If you've never flushed your water heater or haven't done it in years, when you open the drain valve, the sediment will likely clog it and keep you from fully closing the valve after it's drained. Then you'll have a leak too. We'll show you how to drain the sediment and skip a service call. You'll need to get a few plumbing parts from a home center, a garden hose, a wet vacuum, pliers and a pipe wrench.

BUY THE PARTS

The key is to build a new full-port drain valve so you can remove the debris. You'll need a $\frac{3}{4}$ -in. full-port brass ball valve with threaded ends, a 3-in. x $\frac{3}{4}$ -in. galvanized nipple, and a $\frac{3}{4}$ -in. MIP x G.H. garden hose adapter (like the BrassCraft/Plumbshop No. HU22-12-12TP).

Then build a shop vacuum adapter. If your vacuum has a 2½-in. hose, buy a converter to reduce it to 1¼ in. (the Shop Vac No. 9068500 is one option). Make a vacuum hose-to-plumbing adapter (Photo 1) with a 1¼-in. x 1½-in. female PVC trap adapter, a $\frac{3}{4}$ -in. MIP x ½-in. barb fitting, a second $\frac{3}{4}$ -in. x 3-in. nipple and a 24-in. piece of ½-in. I.D. vinyl tubing.

DRAIN THE TANK

Shut off the gas or electricity to the water heater and open a hot water faucet. Let it run full blast for about 10 minutes to reduce the water temperature in the tank. Then shut off the cold water valve at the top of the tank, attach a garden hose to the existing drain valve and route it to a floor drain. (Catch the sediment with a colander so it doesn't clog the drain.) Open a hot water faucet on an upper floor and the water heater drain valve. Let the tank drain until sediment clogs the valve and reduces the flow. Then close the upstairs hot water faucet and water heater drain valve.

Next, remove the blow-off tube and the temperature pressure release (TPR) valve and apply suction to the tank so you won't get soaked when you yank the old valve (Photo 2). Then swap the valves (Photo 3). Remove the vacuum hose from the TPR port and finish draining the tank.

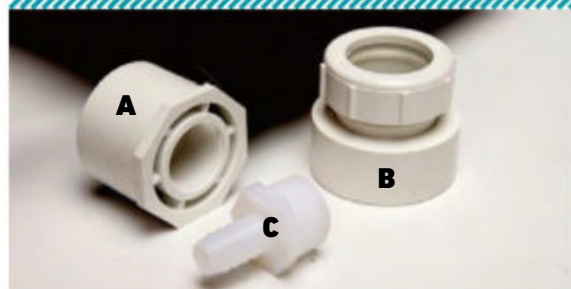
Most of the sediment will flush out. To remove the rest, open the cold water valve at the top of the tank in short bursts to blast it toward the drain. If necessary, vacuum out the last of it (Photo 4).

When you're done, close the ball valve and remove the lever handle to prevent accidental opening. Then reinstall the TPR valve and blow-off tube. Refill the water heater and turn on the gas or electricity.

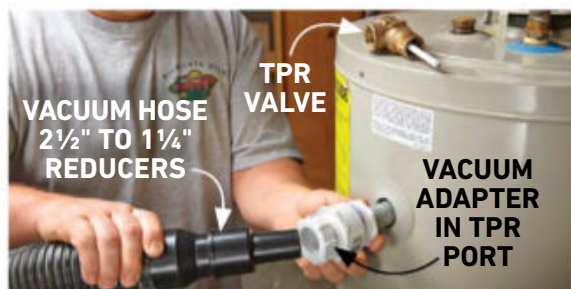
RICK MUSCOPLAT CONTRIBUTING WRITER

YUCK!

This is what the sediment looks like.



1 Glue a 1½-in. PVC x ¾-in. FIP adapter (A) onto a female PVC trap adapter (B). This allows you to attach your vacuum to ¾-in. pipe (see below). The barbed fitting (C) connects to tubing (Photo 4).



2 Remove the temperature pressure release (TPR) valve. Screw in the vacuum adapter. Attach the shop vacuum hose and turn on the vacuum.



3 Unscrew the old drain valve and install the full-port valve (closed position). Attach one end of the garden hose to the valve; run the other end into a colander and on to the floor drain.



4 Remove the full-port valve and suck out the remaining sediment with your shop vacuum adapter and vinyl tubing. See the final steps above.

DEEP-CLEAN YOUR MATTRESS

Your mattress can host a lot of unpleasant stuff: dead skin cells, crumbs and dust mites. But it doesn't have to—here's how to deep-clean it.

The bed manufacturer Serta suggests using the handheld attachment on your vacuum to deep-clean your mattress every few months. Simply run the attachment across the mattress. If you have a pillow-top with seams and quilting, be sure to get in next to the stitching.

For spot cleaning, the Sealy mattress company recommends dabbing a mattress with mild soap and cold water. For tough stains, one option is a three-part combo of baking soda, hydrogen peroxide and water in a spray bottle. Consumer Reports recommends a spray bottle mixture of warm water and dish detergent to remove set-in stains.

Sweat and natural body oil can build up and make your mattress smell. To freshen it, sprinkle a layer of baking soda on the fabric, let it sit for a few minutes, then vacuum. Flip the mattress and repeat.

Finally, don't let all your deep cleaning go to waste. If don't have a mattress cover, get one now.

BRENDA PORTER-ROCKWELL CONTRIBUTING WRITER 



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THE NEW FANDANGO

While I was installing our expensive new ceiling fan, I noticed a red caution tag, but I was eager to proceed, so I figured I'd read it later.

I followed the directions and included the extra bracing. When I was done, I proudly called in my wife. As I flipped the switch, the fan immediately unscrewed itself from the threaded support pipe, came whirling down and crashed to the floor. The fan was destroyed, there were ugly scratches in our new hardwood floor and you can guess what my wife had to say!

When I got around to reading the red tag, here's what it said: "After the pipe is screwed in, use the locking screw provided to lock the pipe onto the main support."

STEPHEN FINEGAN

FAUCET FUMBLE

One summer, my wife installed a new spigot so I could water my plants. After an hour of tinkering, banging and grumbling in the crawl space, she emerged triumphantly. I attached the hose and began showering my crocosmia, but I noticed the nozzle was getting hot.

"Sweetie? The hose is spraying hot water!" I called to her.

"Well, it's a black hose that's been sitting out in the sun. It's just warm from that," she replied.

Minutes later, the water was still steaming. She had connected the spigot to the hot water line! Boy, was she annoyed to head back into that crawl space.

KATE ADAMS

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During a major remodel, I hauled a pickup load of rotted boards to the landfill. The dumping area had huge trash containers, each about the size of a railroad boxcar, set down in a pit.

I backed up to a container that was empty except for a pile of cardboard. I thought the boards would slide off the pickup easily because they were wet and slippery, but they didn't budge. So I gave a mighty pull—they all came loose and I went flying over backward into the trash along with them! I wasn't hurt, but I was embarrassed. I stacked up cardboard to help me climb out before anybody recognized me.

JOSEPH KEHOE





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