THE FAMILY Handyman

QUICK & EASY FIXES & REPAIRS

Unstick a sliding door

Give your lawn first aid

Fix your own furnace

Repair a drywall crack

Plus more...

- Easy-to-use, gives you over 50 helpful repairs, guides & do-it-yourself tips!
- Zoom-in on projects for easy reading!
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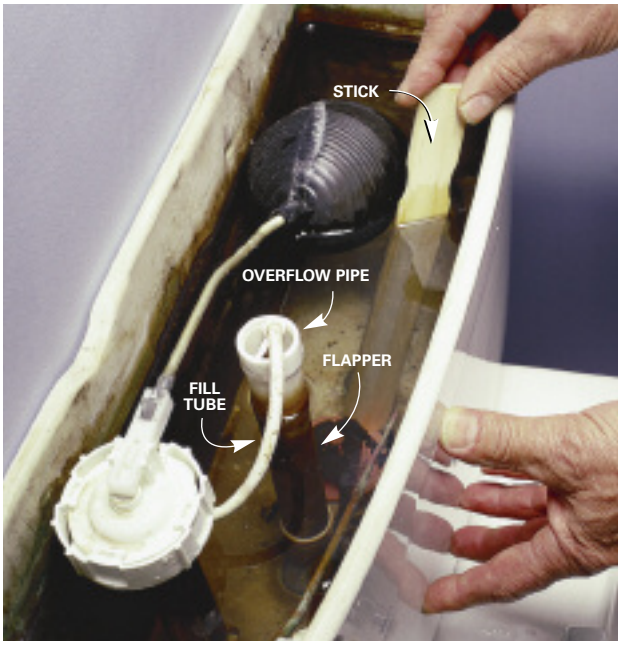
Find help for everything from running toilets to cracks in your walls, brown spots in your yard, and other annoying problems around the house.

home repairs

- Stop a running toilet
- Install toggle bolts
- Adjust a dragging shower door
- Sharpen your mower blade
- Give your lawn first aid
- Seed a bare spot in your yard
- Fix a storm door closer
- Fix a door that doesn't latch
- Fix loose hinges
- Unstick a sliding door
- Free a sticking storm door
- Repair a damaged screen
- Take out dents in a steel door
- Fix your own furnace
- Repair a drywall crack
- Solutions for a bouncy floor
- Replace a sink sprayer and hose
- Relocate a sprinkler head

Stop a **running toilet**



1 **Push down on the flapper with a stick when you hear the water running and listen for it to stop. If it stops, you know the flapper isn't sealing properly. Replace it. Check the fill tube length and cut it back so it's at least 1/2 in. above the water line.**

The mysteries of a running toilet can drive you nuts. Whether you hear water running constantly or cycling on and off, read on to learn how to stop most leaks. Hardware stores and home centers carry the parts for almost every repair.

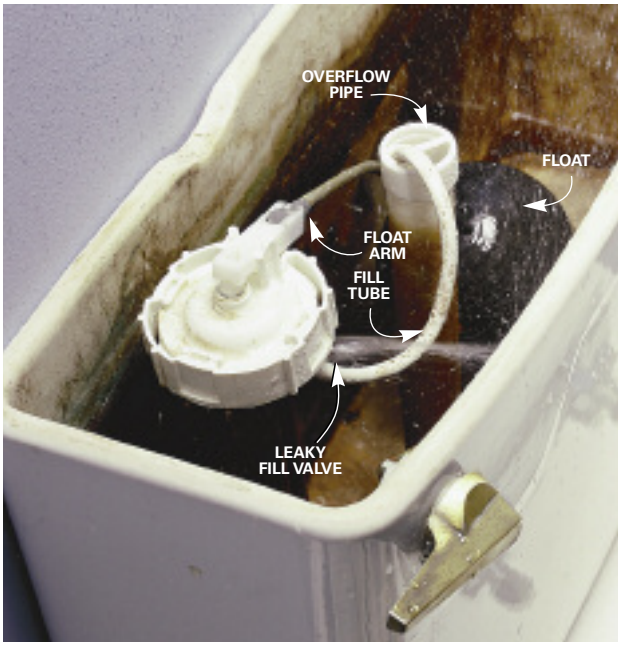
One cause of a running toilet is a flapper that doesn't seal. If water from the tank seeps around the flapper and into the bowl, the flapper is probably shot. Test for a leaky flapper as shown in Photo 1.

To replace the flapper, first shut off the water supply valve under the toilet (or the main supply if the valve leaks!). Flush the toilet to drain out most of the water, and unhook the old flapper. Buy a new flapper of the same type and install it according to the instructions on the package. Hook the flapper chain onto the flush lever arm so there's a little slack when the flapper is closed.

If the flapper doesn't leak and the water still runs, inspect the fill tube connected to the overflow pipe (Photo 1).The end should be above the water line. If the end is under water, cut it back.

Next, inspect the fill valve for visible signs of wear and test the float (Photo 2). If the float is improperly adjusted, the tank water level can rise above the overflow pipe and drain into it. Replace the old fill valve if it doesn't completely shut off or it hampers the float-arm operation (Photo 3).

Install a new "floatcup"-style fill valve as shown in Photos 4 and 5. Adjust the float according to the package instructions to



2 **Flush the toilet and look for a fill valve leak. Lift up on the float arm when the tank is filling to see if the water stops. Bend or adjust the float arm so the tank stops filling when the water level is 1/2 to 1 in. below the top of the overflow pipe. If the fill valve still leaks, replace it (Photo 3).**

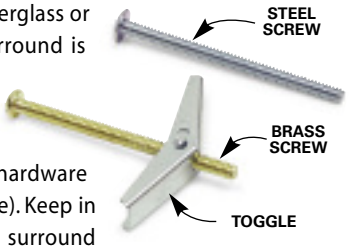
3 **Turn off the water supply, flush the toilet and sponge the remaining water from the tank. Disconnect the water supply line, unscrew the fill valve locknut and lift out the old fill valve.**

4 **Insert the new fill valve into the tank and tighten the locknut a half turn past hand-tight. If the fill valve is at its maximum height, but the overflow pipe is still higher than the critical level mark, shorten the overflow pipe with a hacksaw so it's 1 in. lower than the critical level mark on the fill valve.**

establish the proper water level. Finish the installation by attaching the flapper chain to the flush lever. Turn on the water and test flush the toilet.

5 **Attach one end of the new fill tube to the fill valve nipple and the other to the enclosed angle adapter (shorten the tube to avoid kinks, if necessary). Clip the angle adapter onto the overflow pipe.**

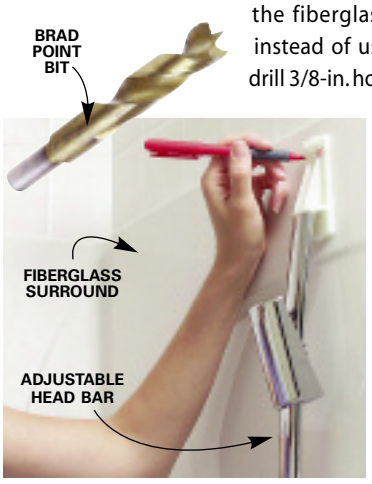
Install toggle bolts



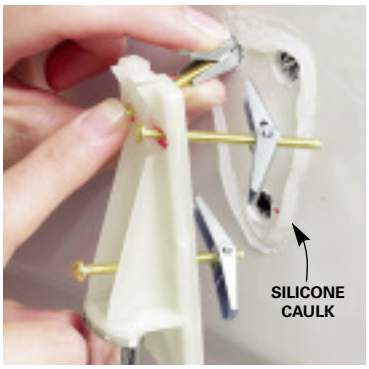
Fastening towel bars, shelves or hooks to a fiberglass or plastic shower surround can be tricky. The surround is simply too thin to hold screws and there's often a gap of 1 in. or more between the surround and the wall studs behind it. But with 1/8-in. toggle bolts, you can mount most light-duty hardware (like the adjustable showerhead bar shown here). Keep in mind that this leaves big holes (3/8 in.) in the surround that can't be patched later, so anything you mount will have to stay there permanently. The mounting system shown here isn't strong enough to support the full weight of a person, so we don't recommend it for installing safety grab bars.

Everything you need is available at home centers and hardware stores. Here are some pointers:

- Some areas of a fiberglass surround may be reinforced with plywood. After you mark the hole locations (Photo 1), drill 3/16-in. holes. If you strike plywood behind the fiberglass, you can drive in stainless steel screws instead of using toggle bolts. If you don't hit plywood, drill 3/8-in. holes.
- When you're drilling through the side of the surround where the shower valve is mounted, apply only light pressure as you drill. Otherwise, you might suddenly punch through the surround and puncture pipes.
- When you buy toggle bolts ($2 per pair), also buy brass machine screws ($1) to replace the steel screws that come with the toggles. Steel heads will rust and stain the surround.
- When you tighten the toggle bolts (Photo 3), it's OK to use a drill. But do the final tightening by hand. Too much torque can crack the surround.



1 **Mark the hole positions and drill 3/8-in. holes through the fiberglass. For a clean, chip-free hole, use a brad point bit.**



2 **Run a light bead of silicone caulk around the holes and insert the toggle bolts.**

3 **Tighten the toggle bolts. Hold the mounting bracket away from the wall as you turn the screws; otherwise the toggle will simply spin inside the wall.**

Adjust a dragging shower door

If the sliding doors on your shower or bathtub don't glide smoothly, repair them soon. A door that drags on the lower track will eventually do permanent damage to both the door and the track. A dragging roller at the top of the door will wear and require replacement.

To start, make sure the rollers on both doors are riding on the tracks inside the upper rail. Sometimes, one roller falls out of the track and the bottom edge of the door skids along the lower rail. In that case, you only have to lift the door and guide the roller back onto the track.

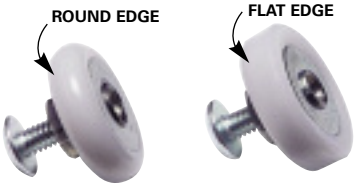
If an off-track roller isn't the problem, you'll have to remove the doors to adjust and possibly replace the rollers. Many doors have a small plastic guide at the middle of the lower rail. To remove this type of guide, just remove a single screw. Others have a guide rail screwed to the door (Photo 1).

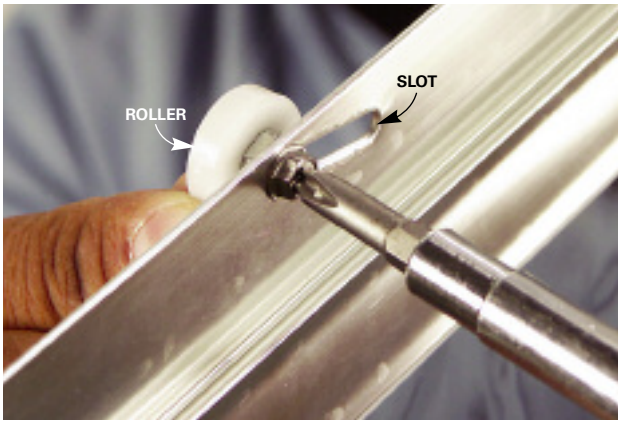
1 **Unscrew the guide at the lower edge of the sliding door. Protect the shower or tub from scratches with a drop cloth.**

With the guide removed, lift the doors out of their tracks (Photo 2). Then make sure the rollers turn easily. If not, apply a little silicone spray lubricant. Some lubricants can harm plastic, so check the label. If the lubricant doesn't do the trick, replace the rollers. Most home centers and some hardware stores carry replacements ($3 per pair). Take an old roller with you to find a match. In many cases, you can use a replacement that's slightly larger or smaller than the original. But be sure to check that the original and replacement edges match—either rounded or flat. If you can't find rollers locally, type "shower door parts" into any online search engine to find a supplier.

2 **Lift the door out of its track inside the upper rail. Tilt each door in or out to remove it. Wipe both tracks clean.**

Screw the new rollers into place and rehang the doors. You'll probably have to remove the doors once or twice to adjust the rollers for smooth operation (Photo 3).





3 **Raise or lower each door by repositioning the roller in its slanted slot. Loosen the screw to move the roller.**

Sharpen your mower blade

One of the best ways to encourage a greener, fuller and healthier lawn is to sharpen your lawn mower blade. A dull blade rips and pulls the grass blades, leaving ragged tears that both weaken the plant and promote fungal growth and other grass diseases. A sharp blade, on the other hand, cuts cleanly, allowing the plant to heal and recover quickly. Sharp blades also let you complete your lawn-cutting chore faster and with less stress on the mower.

Sharpening is a simple task, even for a novice. It'll take a few sharpenings to master the technique. After that, the chore will take less than 10 minutes. Plan to do it twice every mowing season. Here you'll learn the steps that will work for just about any walk-behind mower.

Play it safe when removing the blade

Always disconnect the spark plug wire and remove the spark plug before you touch the blade (Photo 1). The blade and shaft are directly connected to the motor, and in some cases turning the blade by hand could cause the motor to fire, unless the spark plug is removed.

Then look for the carburetor and air filter. The carburetor is usually easy to recognize because it has throttle cables running to it. If you keep this side up when you tip your mower over to get at the blade (Photo 2), you won't get a smoke cloud from leaking oil the next time you start it. Some mowers have gas caps with air holes that could leak a little gas onto your garage floor, so work outside or keep a rag handy to clean up drips. Once the blade is off, set the mower back onto all four wheels until you're ready to reinstall your blade.

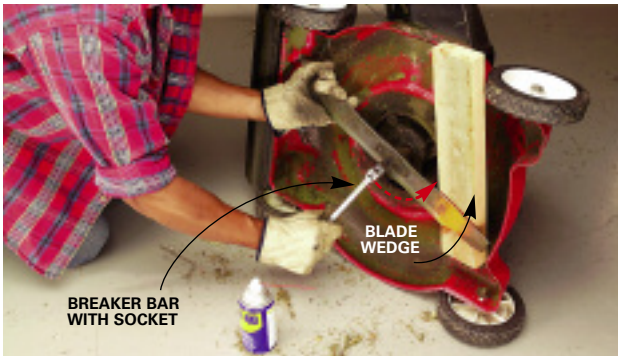
You'll usually find a single bolt or nut holding the blade on. It's usually very tight and you'll need to clamp the blade to loosen it. The 2x4 method shown here (Photo 3) is simple, quick and safe.

1 **Pull the spark plug wire from the spark plug to prevent the motor from accidentally starting. Then remove the spark plug.**

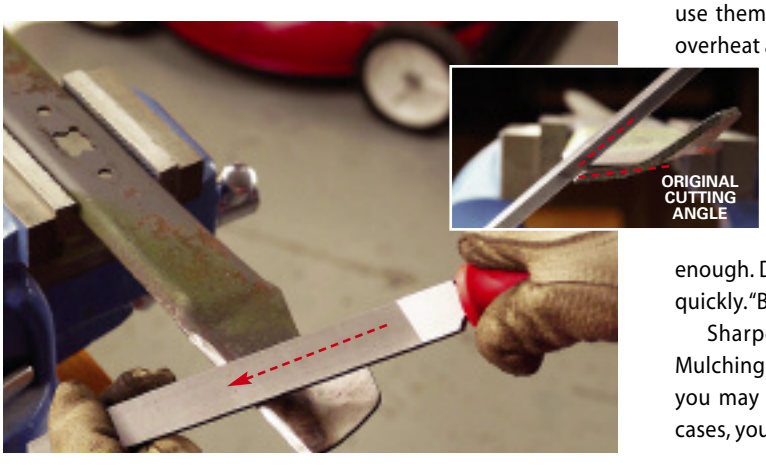
2 **Turn the mower onto its side with the air filter and carburetor side up. This keeps oil and gas from dripping into the air filter.**

Mark your blade

Mark your blade with spray paint before you remove it so you know which way to reinstall it. Mower repair pros say that the biggest mistake homeowners make is installing a blade upside down after sharpening it. The blade won't cut—and they'll go nuts trying to figure out why!



3 **Wedge a short 2x4 between the blade and the deck to clamp the blade. Loosen the bolt (or nut) with a long-handled wrench. Turn counterclockwise. Remove the bolt and blade.**



4 **Clamp the blade in a vise and sharpen the cutting edge with a mill bastard file, held at the same cutting angle as before. File until the blade is "butter knife" sharp.**

Don't use your foot! A good tool to keep handy to loosen the bolt is a 10-in. breaker bar with a socket to match the bolt. It'll give you plenty of leverage to loosen extremely tight bolts, and you can keep your knuckles well away from the blade when bearing down. Use a squirt of penetrating oil on really rusted, stuck bolts. Wait 10 minutes to give it time to work.

Sharpen it with a file

Sharpen the blade with a hand file (Photo 4). Mower blades are made from fairly soft steel. You can sharpen most blades with fewer than 50 strokes of a clean, sharp mill bastard file that's at least 10 in. long. Grinders also work, and much more quickly. (Pros use them.) But they're more difficult to control and you might overheat and ruin the blade.

Always sharpen from the top side of the cutting edge; this will give you the longest-lasting edge on the blade. The file cuts in one direction only, on the push stroke; you'll feel it bite into the steel on the blade. If you don't feel that cutting action, your file is probably dull or you're not pressing down hard enough. Don't try to make your blade razor sharp; it'll dull more quickly. "Butter knife" sharp will do.

Sharpening mulching blades is sometimes more difficult. Mulching blades may have longer or curved cutting edges, and you may need several types of files to sharpen them. In some cases, you may have to resort to a 4-1/2-in. angle grinder. If your blade is too difficult to sharpen, take it to a hardware store or a blade sharpening service. You can have it sharpened for about $6.

Do you need a new blade?

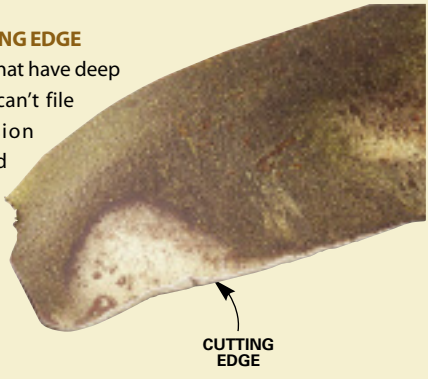
Examine your blade when you remove it and look for the problems shown here. If you're unsure of the condition of the blade, take it to a hardware store or home center and compare it with a new one.

BENT

Set your old blade on your workbench and check for bends. If you're unsure, compare it with a new blade.

DENTS IN CUTTING EDGE

Replace blades that have deep dents that you can't file out and erosion from wear and sharpening. Also replace any blade that has cracked.



5 Hang the blade on a nail to check the balance. If one side dips, file a bit more off that side until the blade remains horizontal.

Balance it before reinstalling

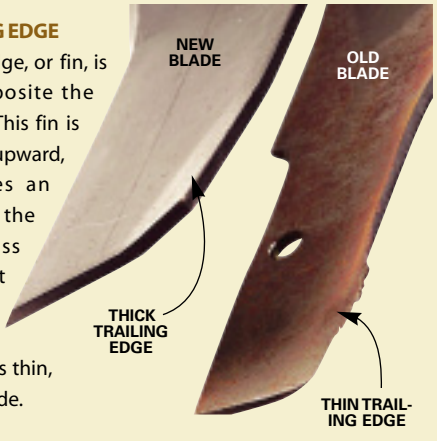
Before you reinstall the blade, be sure to balance it. An unbalanced blade will cause vibration and possibly ruin the blade shaft or bearings. To check the balance, simply drive a nail into a stud and set the blade onto it like an airplane propeller (Photo 5). If one side falls, it's heavier, and you have to file more metal off it. Keep filing until the blade stays level.

Reinstall the blade and hand-tighten the bolt. Insert the 2x4 in the reverse direction so you can bear down on the breaker bar to tighten the bolt. It's difficult to overtighten the bolt. Mower sharpening pros say that the second most common mistake they see is undertightening the bolt. A loose blade throws off the engine timing and sometimes makes the mower hard to start.

6 Reinstall the blade and screw in the bolt. Then wedge the 2x4 back in and tighten the bolt firmly with your socket and breaker bar.

THIN TRAILING EDGE

The trailing edge, or fin, is the edge opposite the cutting edge. This fin is often slanted upward, which creates an updraft to lift the grass and grass clippings. Dust and sand will wear this fin down. When it's thin, replace the blade.



No excuses!

To get in the habit of keeping your blade sharp, dedicate a set of tools for sharpening only. Hang them nearby so they're ready to go. And keep a second, sharp blade handy too. You can slip it on and sharpen the dull one later.

Buying a new blade

Always replace your blade with an exact replacement blade, or the blade recommended in your owner's manual. Resist the temptation to convert your regular straight-blade mower to a fancier mulching mower by simply changing the blade. Your mower probably won't work any differently than before, and it may not work as well. The mower deck on a straight-blade mower is shallow and has a side discharge to eject the grass clippings quickly. A mulching mower has a deeper deck without a side discharge; the grass is chopped three or four times before it drops to the ground. The mower design is as important as the blade.

Give your lawn first aid

Problem: Dog spots on grass

Symptoms: Dog spots are round patches about 4 to 8 in. in diameter with dead grass in the middle, encircled by dark green grass. They're most apparent in the early spring when dormant grass first begins to turn green again.

Cause: Dog urine contains high concentrations of acids, salts and nitrogen, which burn (dry out) the grass roots and kill them. As rain washes the area, the urine is diluted and the nitrogen spreads, causing the grass surrounding the spot to grow faster and turn greener.

Remedy: You have to replant your grass; it won't come back on its own. But first you have to dilute or remove the caustic urine from the soil (Photo 1). Thoroughly soak the area with lots of water. Let the hose run for at least three minutes. Then you can start the replanting process (Photo 2). Add a half inch of new soil to help absorb any remaining urine (Photo 3). Then you can spread new seed or use a commercial yard patch mixture (available at most nurseries or home centers) or even sod. In any case, the secret of good germination is keeping the seed moist. And keep the area moist until the new grass is about 3 in. high.

Recovery time: Four to six weeks

An ounce of prevention

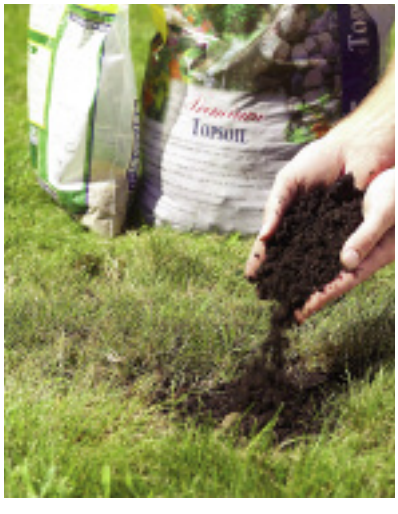
1. Soak your pet's favorite areas in your lawn to get the salts out of the root zone before they kill the grass.
2. Fertilize your lawn in the spring to boost the overall color and mask the darker green dog spots.
3. Train your pet to urinate in a designated area. Replace or repair the grass in this area annually or cover it with mulch.
4. Keep your pet well hydrated to make its urine less concentrated.

tip

When you're watering new seed, moisten the soil daily and keep it damp—but don't soak it. Overwatering is a common mistake.

1 Soak the patch until the grass is sopping wet to dilute the urine acids and salts and wash them deeper into the soil, beyond the grass roots.

2 Scrape up the dead grass with a hand rake and remove it. Rough up the area to loosen the soil 1/2 in. deep. Seeds germinate better in soft soil.



3 Sprinkle on a 1/2-in.-thick layer of topsoil, then pepper it with grass seed. Cover with a pinch of new soil and press it to firm it up. Keep the area moist until the new grass is about 3 in. high.

Problem: Grubs

Symptoms: Grub-chewed turf has patchy areas that wilt and die. You can easily pull up the affected turf if you tug on it. Another indicator of grubs may be increased raccoon, bird or mole activity. They like to dig up and eat the grubs at night. While this may sound good, the moles will kill the grass as they forage for grubs.

Cause: Lawn grubs are the larval stage of moths and beetles. The grubs eat the roots of grass, which causes death by dehydration.

Remedy: Be vigilant. Are beetles swarming around your porch light? In the next month, keep an eye out for patches of grass that wilt or are blue-green on hot days. They may be larvae infested. Turn over some turf (Photo 1). If you count six to 10 grubs (white wormlike larvae with black heads) under a 1-ft.-square area of sod, consider using a grub insecticide (available at home centers and nurseries). Or talk to a professional (look under "Grass Service" in your yellow pages) about treating your yard. They will be familiar with the grub problems in your region and the most suitable treatment methods.

If you spot the grubs but your count is lower than six per square foot, baby your lawn to strengthen its natural defenses. Mow on higher blade settings and water thoroughly but infrequently to encourage the grass to grow new, deep roots. Do not cut off more than one-third of the grass height at each mowing, to avoid stressing the plant.

An ounce of prevention

Inspect your turf periodically by pulling on patches that look unhealthy, or have a professional inspect your lawn if you suspect a problem.

tip

A grub problem is often indicated by increased mole, bird and raccoon activity. They dig up and feed on grubs at night. This may sound good, but moles kill your grass along with the grubs.

1 Pierce lawn with a shovel in a U-shape. Peel back the lawn (as though rolling up a rug) and count the white grubs in a 1-sq.-ft. area.

2 Treat your lawn with an insecticide if the count is six to 10 grubs in a square foot. Follow the manufacturer's directions carefully. Or consult with a yard service.

Problem: Fairy ring

Symptoms: Fairy rings are circles approximately 3 to 8 ft. wide that consist of a dark green and fast-growing area of grass surrounding an inner area of partially dead or thin grass. Some rings also produce mushrooms.

Cause: Fairy rings are caused by fungi that live in the soil. As the fungi feed on organic matter, they release nitrogen, causing the grass to turn dark green. As the colony grows, it disturbs the flow of needed water to the turf roots, creating thin or dead spots. Fairy rings often begin with the decomposition of organic matter, such as an old tree stump buried under the lawn.

Remedy: By bringing up the color in the rest of your lawn with a nitrogen fertilizer, you can mask much of the overgreening of the fairy ring (Photo 1). Hand-aerating the ring will break up the fungus and allow the flow of water and other nutrients to the grass roots (Photo 2).

Recovery time: Generally fairy rings can be masked with the application of fertilizer, with results in 10 to 14 days. The grass within the ring will thicken up with aeration in about two to three weeks.

An ounce of prevention

Aeration will help with fairy rings, but maintaining a healthy lawn with a balanced fertilization program is essential.
Apply three doses:

1. Apply 1/2 lb. per 1,000 sq. ft. in late April or early May to give the overwintering grass roots a bit of a boost.
2. Add no more than 1/2 lb. per 1,000 sq. ft. at the end of June or in early July when temperatures are not at their peak. Stimulating growth during a heat wave will stress the plants.
3. Spread 1 lb. per 1,000 sq. ft. at the end of October. The best root growth takes place when the soil temps are between 58 and 65 degrees F. The roots store energy over the winter, making the entire lawn healthier the following spring.

1 **Spread 1/2 lb. of nitrogen fertilizer per 1,000 sq. ft. to green up your lawn, but skip the fairy ring zone. This masks the lush green of the fairy ring by blending it into the rest of your yard.**

2 **Break up the fungi with a hand aerator ($20 at a home center or garden store). Punch holes every 2 to 4 in. throughout the ring and 2 ft. beyond.**

3 **Go "treasure" hunting if you see no improvement in three weeks. Dig out rotting stumps, roots, construction debris or other organic materials under your lawn.**

Problem: Shade

Symptoms: Shaded grass will look thin and patchy. Some types of grass actually produce wider blades as the plant attempts to catch more rays. But they also produce far fewer blades, lending a spindly appearance to the lawn. The truth is, if your lawn gets less than six to eight hours of sun daily, you are unlikely to sustain lush grass.

Cause: Trees, buildings and bushes.

Remedy: There are no good remedies. You can increase the sunlight as much as possible by trimming trees and shrubs. Also try starting areas in shade with sod instead of seed. The sod will adjust to the lower level of light. Although all seed varieties have their shade limitations, try overseeding your thin area with a shady grass mix.

Or throw in the towel, grab your trowel and plant a shade-tolerant ground cover. Many will thrive where your turf withered. Lamium (dead nettle) and ajuga (bugleweed) collaborate nicely in providing lovely blooms and an enthusiastic, but not invasive, carpet. This pair fares well, with a hearty tolerance spanning zones 3 to 8, and can be planted right up to your grass. They are fairly low growers and won't get more than a few nicks from a lawn mower.

Also, mulching between the ground cover plants will help retain moisture. This is especially wise if your new shade garden is on a slope; mulch will help prevent your fledging plants from washing out in a hard rain.

Recovery time: The plants and mulch will immediately boost the appearance of an area that was once thin grass. It'll take a couple of seasons for the ground cover to become established and blanket the area.

Using a garden hoe, work up the shady area to remove any struggling grass. Plant ground cover or a shade garden.

An ounce of prevention

Avoid the frustration of sun-starved grass by starting a shade garden or ground cover in any area that doesn't receive six to eight hours of good light per day.

Problem: Thatch

Symptoms: If your grass feels soft and spongy when you walk on it, your lawn may have a thatch buildup. Thatch is a fibrous mat of dead stalks and roots that settles between the lawn's green leaves and the soil (photo right). When this mat becomes greater than 3/4 in. thick, it can cause your lawn to suffer from heat and drought. Affected lawns will rapidly wilt and turn blue-green, indicating they're hot and dry.

Cause: Cutting off too much at each mowing (letting the grass get too long) and cutting too low. Both will produce more dead grass tissue than microbes and earthworms can recycle. Thatch can develop in any soil but is most often associated with high clay content. Other causes are overfertilization and frequent, light watering, which encourage a shallow root system.

Remedy: Slice open a section of your lawn (Photo 1). If your grass shows 3/4 in. or more of thatch, it's time to rent an aerator (about $70 per day). An aerator is a heavy machine that opens the soil by pulling up finger-size soil cores. The lawn will absorb more oxygen and water, which will encourage healthy microbe growth and give worms wiggle room.

CAUTION:
Call your local utility provider to mark your underground utility lines before you aerate.

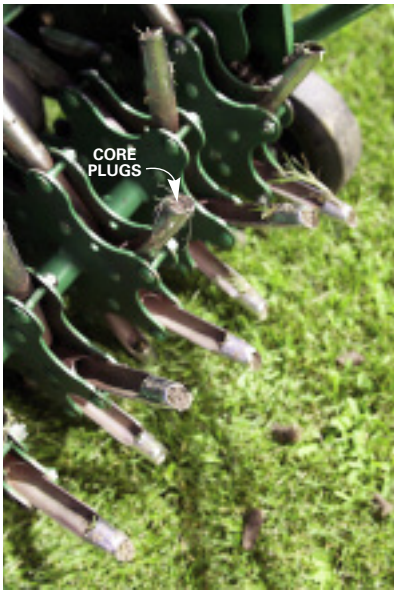
Aerate in the spring or fall when the grass is growing but the weather is not too hot to stress the plants (Photo 2). If the machine isn't pulling plugs, your lawn may be too dry. To avoid this problem, water thoroughly the day before you aerate. You can also rake in topsoil (Photo 3) to increase the healthy microorganisms that aid thatch's natural decomposition. Topsoil is available at any garden center.

An ounce of prevention

1. Mow often and cut no more than one-third of the grass height.
2. Water your lawn less often but for longer periods to prevent shallow root systems.
3. Reduce the amount of fertilizer you spread at any one time.
4. Reduce the use of pesticides. This will help keep the worm and microorganism populations healthy.
5. Aerate at least once every year if your lawn is prone to thatch.

Recovery time: You can expect the thatch layer to decrease by about 1/4 in. per year, about the same rate at which it forms.

1 **Slice the turf grass with a shovel and pry it back. If the thatch depth measures more than 3/4 in., aerate at least 3 in. deep.**



2 **Make two or three passes with an aerator until you've made 3-in.-deep holes 2 in. apart throughout your yard.**

3 **Spread 1/4 in. of topsoil on the yard's most thatchy areas and then rake vigorously to fill the holes with loose soil.**

Renting a lawn aerator

If your goal is to have one of the nicest lawns on the block, you can go a long way toward achieving it with annual aeration.

When a lawn lacks sufficient air (a "compacted" condition), it grows slowly and becomes vulnerable to disease, insects and heat damage. The soil will become impermeable and shed water instead of absorbing it.

Gas-powered aerators are available at most tool rental stores. They're slow-moving but powerful machines, so ask the clerk for handling directions. An aerator weighs about 200 lbs., so be prepared for some heavy lifting or ask your rental store for a ramp to get it into a truck bed or van.

Cool-season grasses should be aerated in the late summer or early fall. Spring is best for warm-season types. (If you're not sure what type you have, take a sample to an expert at a local garden center.)

Resist the temptation to remove the thatch with a rented power rake. Power raking is less effective than aerating because it typically removes less than 15 percent of thatch and may damage the healthy grass as well.

Seed a **bare spot** in your yard

Dead spots on a lawn may be caused by disease, repeated dog visits or snow mold. Simply adding extra fertilizer or randomly scattering seed on the bad spot isn't going to revive it. Start over by digging out the old sod and disposing of it; don't put diseased sod in your compost bin.

Holding a spade at a low angle, scrape out the dead grass (including roots) from a circular area 6 in. greater around than the bad spot. Next, use the spade to level out the soil and cut in a pattern of seed furrows (see photo). This crosshatching will create the proper pattern and depth for new seed to germinate.

Select seed that matches the variety already planted in the lawn. You don't want the new growth to contrast starkly with your established lawn. Distribute a handful of the new seed over the prepared spot and "close the soil" using the back of a short-tined rake. Water the area lightly and frequently until the roots are established.

Prepare a small area for new seed by chopping 1/2-in.-deep slits in the soil with a spade. Make a crosshatch pattern by cutting parallel lines 1/2 in. between slits first in one direction, and then perpendicular to it.

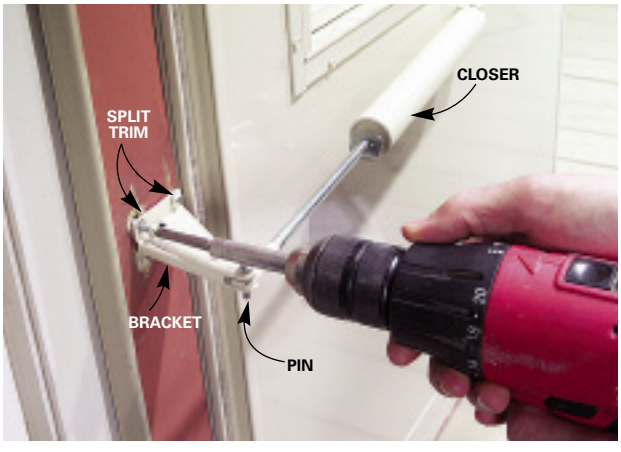
Fix a storm door closer

A heavy wind can catch a storm door and whip it open like a sail, tearing out the closer mounting bracket and cracking the door frame. And often the mounting screws strip and loosen from heavy wear.

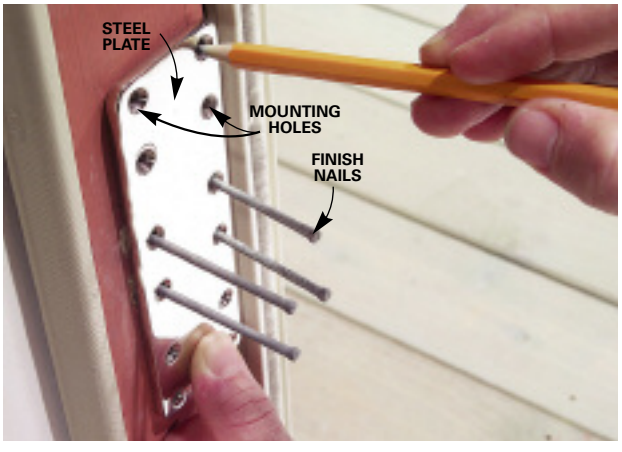
Fixing the problem used to involve the tricky job of patching the old holes or even splicing in new trim. However, a product called the "Ultra Jamb Reinforcer" ($8 plus $6 shipping) eliminates all that hassle. It's available by calling (412) 370-0888 or visiting www.ultrajamb.com. This product includes a new closer bracket, mounting hardware and a heavy-duty steel plate that reinforces the door frame. The steel plate can be mounted anywhere on the door frame, accommodating virtually any type of closer bracket.

To begin, remove the old bracket as shown in Photo 1. Pop the pin to release the piston arm and discard the old bracket. To install the reinforcer, mark and drill the eight mounting holes for the steel plate (Photos 2 and 3). Make sure to mount the plate parallel to the frame edges. This plate will allow you to drill new mounting holes in sound wood, and should cover most trim damage caused by the old bracket. Fill and paint any cracks not covered by the steel plate. Mount the steel plate to the door frame with the eight No. 6 wood screws enclosed in the package.

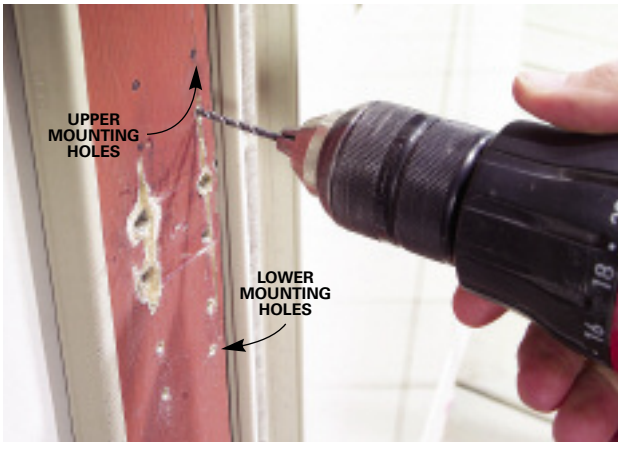
The new closer bracket is mounted to the steel plate with four No. 10 machine screws (Photo 4). Be sure to position the closer bracket so the angled edge faces the storm door. This provides the required spacing between the doorjamb and storm door, allowing the closer to function properly. Connect the piston arm to the new bracket with the piston pin and test the door.



1 Lock the storm door all the way open. Remove the old closer bracket screws and bracket. Pull out the piston pin and discard the old bracket.



2 Slide small finish nails through the new steel plate and into the old screw holes to align it. Mark the eight mounting holes.



3 Drill the upper and lower mounting holes with a 3/32-in. drill bit.

4 Screw the steel plate to the door frame with wood screws. Mount the closer bracket to the steel plate with machine screws. Make sure the angled edge of the bracket faces the storm door.

Fix a door that doesn't latch

1 Shave off the inside of the strike plate with a rotary tool and a metal-cutting carbide bit. Remove a small amount and test the latch by closing the door. Continue removing metal until the door latch catches.

As a house settles, doorknob latches and strike plates sometimes become misaligned, so doors won't latch shut. Usually you have to push the door in, and either pull up or press down on the doorknob in order to get the latch to catch in the strike plate.

If the movement has been slight, there's a very simple fix for the problem. Instead of moving the strike plate, slightly enlarge the latch opening in the strike plate as shown here. A rotary tool does this quickly and easily. Use a carbide-cutting bit specifically designed for metal cutting.

CAUTION:
Grinding metal can throw sparks and fragments into the air, so wear safety glasses with side shields, or full goggles when grinding. Otherwise, use a small round file.

Judge the part of the strike plate that needs grinding by testing when the latch catches. If you have to push down on the doorknob, then the top of the strike plate hole needs grinding. If the door has to be pushed in, then grind the outside edge of the strike plate hole.

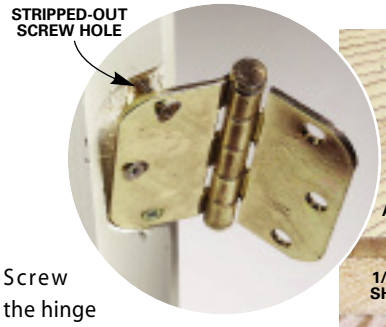
You don't want the latch slopping around inside a huge opening, so don't grind away half the strike plate. Remove small amounts of metal and then test the door. Repeat until the door latch effortlessly catches the strike plate.

Fix loose hinges

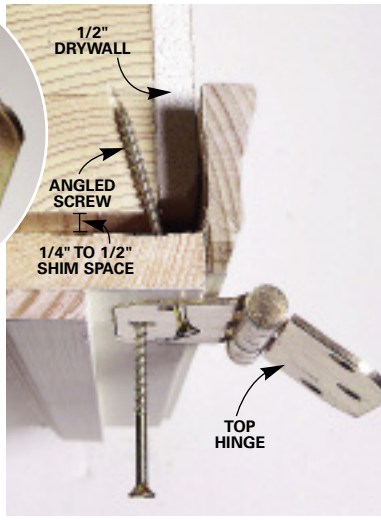
One day the door closes smoothly; the next day it's sticking. And the sticking grows worse as the weeks pass. It's a common old-house problem, but it can happen anywhere kids hang from doorknobs.

The screws holding the top hinges carry most of the weight of the door and are almost always the first to pull out, especially after they've been repeatedly tightened over the years (inset photo). The best way to beef them up is to replace the standard 3/4-in. hinge screws with at least two 3-in. screws that go through the jambs and solidly anchor into the framing. If the door has a large hinge with four screw holes, just drive 3-in. screws straight through the two holes toward the center of the door. However, if the hinge has only three holes, add a 3-in. screw through the middle hole and redrill the top screw hole at a slight angle so the screw hits solid wood (photo right).

Start the drill bit at a sharp angle so the bit doesn't follow the old screw hole. As soon as you feel a fresh hole starting, tip the drill bit back to an angle that will hit the stud—the angle shown here should work for most doors. If the bit or screw seems to be sliding off to the side between the drywall and the wood, redrill at a sharper angle.



Screw the hinge back in with yellow dichromate (zinc-plated) screws—the color and head size of these rust-resistant drywall screws are a good match for standard brass hinge screws. If the door doesn't shut properly after all the screws are driven in, they may have been driven in too far, pulling the door frame out of plumb. Just back the screws out a few turns.



Replace short hinge screws with long screws when the screw holes no longer hold. Angle the long screws toward the studs to make sure they catch.

Unstick a sliding door

Years of dirt, exposure to the elements and hard use can turn sliding doors into sticking doors, but the problem is usually easy to fix.

Start with a good cleaning. Scrub caked dirt and grime out of the track with a stiff brush and soapy water. If the door still doesn't slide smoothly, the rollers under the door either need adjusting or are shot.

Locate the two adjusting screws at the bottom of the door (on the face or edge of the door) and pry off the trim caps that cover the screws. If one side looks lower, raise it until the door looks even on the track (Photo 1). If the door still sticks, turn both screws a quarter turn to raise the whole door. Then slide the door just short of the jamb and be sure the gap is even.

If the door still doesn't glide smoothly, you'll have to remove the door and examine the rollers. Unscrew the stop molding on the inside of the jamb (Photo 2). Be sure to hold the door in place once the stop is removed—if you forget and walk away for a moment, the door will fall in, requiring a much bigger repair! Tilt the door back (Photo 3) and set it on sawhorses. Inspect the rollers for problems. If they're full of dirt and debris, give them a good cleaning and a few drops of lubricant (like WD-40) and see if they spin freely. However, if the rollers are worn, cracked or bent, remove them (Photo 4) and replace them with a new pair ($8 to $16 a pair).

You can order rollers and other door parts through lumberyards and home centers or online (www.alcosupply.com or www.blainewindow.com). Look for the door manufacturer's name on the edge of the door or the hardware manufacturer's name on the roller.

1 Lift or lower the door on the track with a screwdriver or Allen wrench. Raise it just enough to clear the track and roll smoothly.

2 Remove the screws that hold the stop molding. Cut the paint or varnish line on the room side of the stop molding so the molding will pull off cleanly.

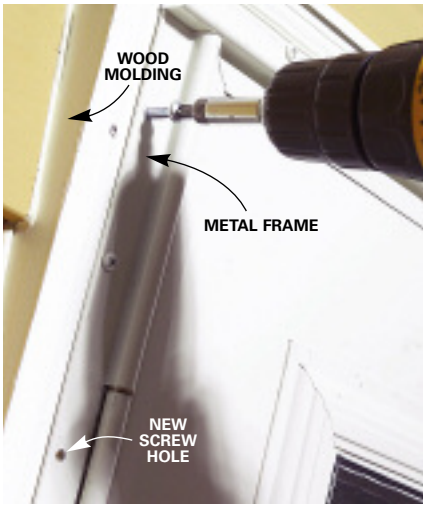
Free a sticking storm door

If your storm door won't close without a firm tug—or it won't close at all—it's probably rubbing against the frame, wearing off the paint and grating on your nerves. Most storm doors are mounted on a metal frame that's screwed to wood molding surrounding the door. When the metal frame on the hinge side of the door comes loose, or the molding itself loosens, the door sags and scrapes against the other side of the frame, usually near the top.

Before you grab your tools, partly open the door from the outside and push the door up and down. Watch the hinge side of the door frame. If the molding moves, secure it with extra nails (Photo 1). Start by adding a couple of nails near the top of the wood trim. Then add nails farther down if necessary. Sink the nailheads slightly with a nail set, cover the heads with acrylic caulk and touch up the molding with paint.

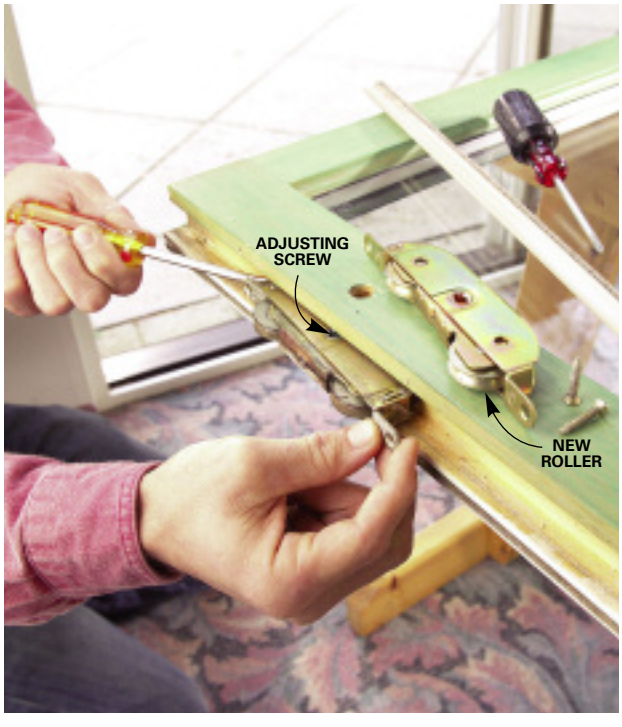
More often than not, it's the metal frame that comes loose, not the wood trim. To fix the metal frame, buy a few No. 8 x 1-in. pan head screws. Stainless steel screws are best. Stick a shim between the door and the frame (as in Photo 1), tighten the existing screws and drill new screw holes through the frame. Press lightly as you drill the metal; you don't want to drill into the wood molding with the 3/16-in. bit. Then drill a 3/32-in. pilot hole into the wood and add screws (Photo 2). In most cases, two or three screws added near the top of the frame will do the job.

1 Position the door by wedging a shim between the door and the frame. Predrill and drive 10d galvanized finish nails to firmly fasten the molding.



2 Drill new 3/16-in. screw holes through the metal frame. Then drill 3/32-in. pilot holes into the wood and drive in No. 8 x 1-in. screws. For a neater look, spray-paint the screw heads first.

3 Grip the door by the edges and tip it about a foot into the room. Lift it up and out of the track one edge at a time.



4 Unscrew and pry out the screws that hold the roller in, then carefully lever it out with a screwdriver. Clean or replace the rollers.

Repair a damaged screen

Balls hit them, kids push on them and pets try to run through them. Whether your screens are aluminum or fiberglass, they'll get punctured or torn. Repairing a damaged screen is easy and takes only a few minutes.

If the screen's aluminum frame is in good shape, you'll need only the following: a roll of new screen material, a package of spline (the thin rubber strip that holds the screen material on the frame) and a screen rolling tool. You'll find all these items at home centers and hardware stores.

The steps shown here apply only to aluminum frame screens.

Selecting screen material

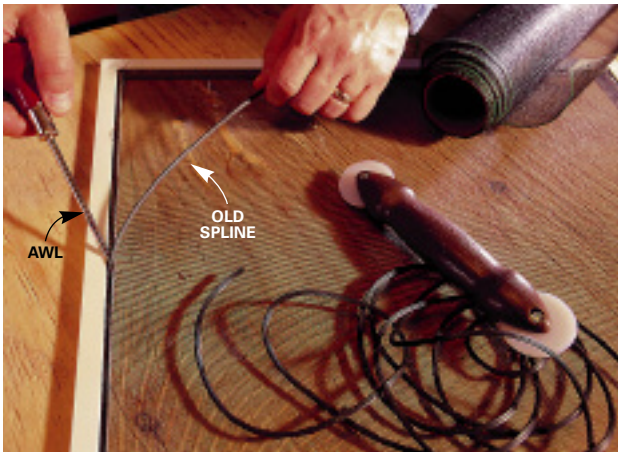
The most popular replacement screen material is fiberglass, as shown here. Its flexibility makes it the easiest to use—if you make a mistake, you can take it out of the frame and try again. Aluminum screen is sturdier, but you only get one chance. The grooves you've made with the screen rolling tool are there to stay.

A third type of screen material that's popular is sun-shading fabric. It blocks more sun, which means less load on your air-conditioning system and less fading of your carpet, draperies and furniture. It's also stronger than fiberglass and aluminum screening, so it's great for pet owners.

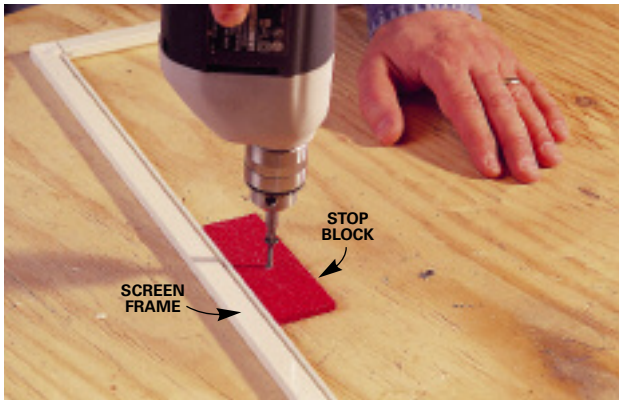
tip

If your long screens don't have a support, you can make one out of aluminum frame stock. It's located near the screening supplies in most stores. The aluminum stock can be cut with tin snips and trimmed to fit.

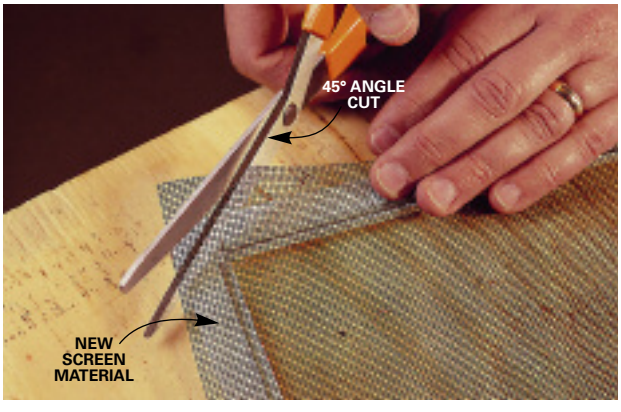
All three materials come in gray or black to match your other window screens. You can also get shiny aluminum as well as sun-shading fabrics in bronze and brown tones. Know the size of your window when you go to the home center. It will sell premeasured rolls to fit nearly any opening. If your screen frame is taller than 36 in., it should have a center support to keep it from bowing in once the material is in place. Newer screens usually come with this support.



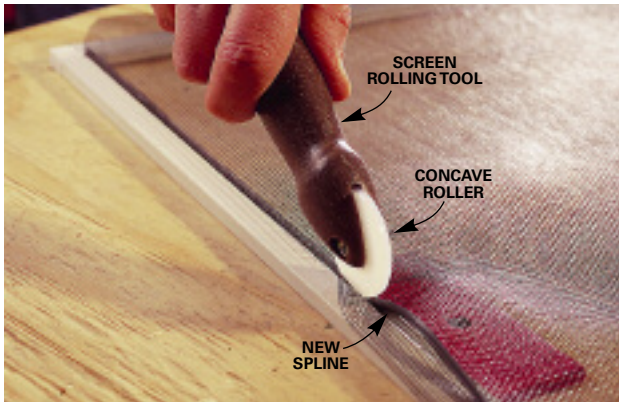
1 **Pry out the old spline with an awl or a narrow-tipped screwdriver. Throw it away—spline gets hard and brittle as it ages and shouldn't be reused.**



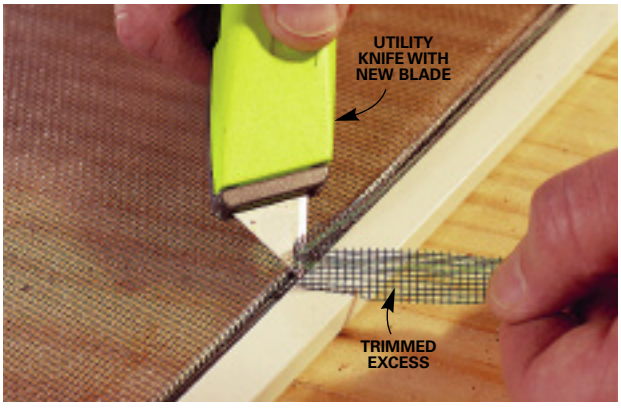
2 **Place wooden blocks along the inside of the two longest sides of the frame and secure them to the work surface. The blocks keep the frame from bowing inward when you install the new screen material.**



3 **Lay the new screen material over the frame. It should overlap the frame by about 3/4 to 1 in. Cut each corner at a 45-degree angle just slightly beyond the spline groove. The cuts keep the screen from bunching in the corners.**



4 **Begin installing the new spline at a corner. Use the screen rolling tool to push the spline and screen material into the groove. Continue around the frame. If wrinkles or bulges appear, remove the spline and reroll. Small wrinkles should tighten up as you get back to the starting corner.**



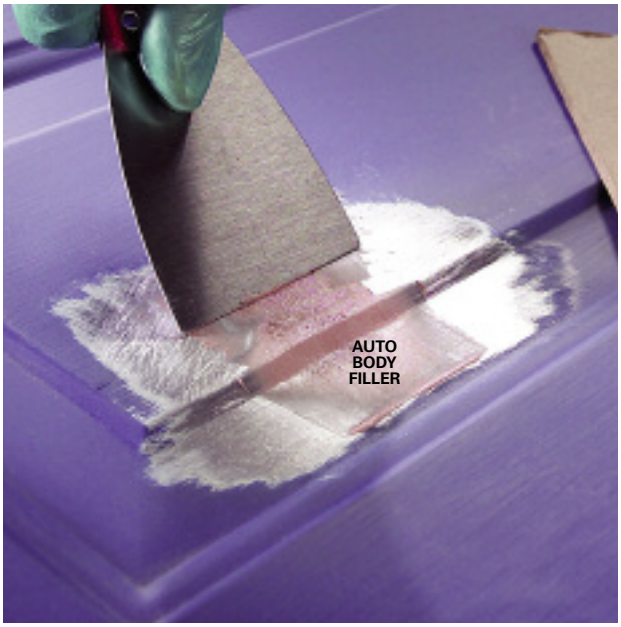
5 **Trim excess screen material using a utility knife with a new sharp blade. A dull blade will pull the material, not cut it. Cut with the blade on top of the spline and pointed toward the outside of the frame.**

Take out dents in a steel door

Fill a dent or hole in a steel door the same way a body shop would fix your car. You can do this with the door in place, but it will be easier with the door lying flat on sawhorses. Remove an area of paint a couple of inches larger than the damaged spot (Photo 1). Sand away the paint with 60- or 80-grit paper, or do the job faster with a small wire wheel ($7) in a drill. Next, fill the dent with auto body filler ($10 at hardware stores and home centers). To mix the filler, place a scoop of resin on a scrap of plywood or hardboard. Then add the hardener. Mix the two components thoroughly; unmixed resin won't harden and you'll be left with a sticky mess. A plastic putty knife ($1) makes a good mixing tool.

Apply the filler with a metal putty knife that's wider than the damaged spot (Photo 2). The filler will start to harden in just a couple of minutes, so you have to work fast. Fill the repair flush with the surrounding surface. Don't overfill it and don't try to smooth out imperfections after the filler begins to harden. Adding another coat of filler is easier than sanding off humps. When the filler has hardened completely (about 30 minutes), sand it smooth (Photo 3). After priming the repair, you can paint over the primer only. But the new paint won't perfectly match the older paint, so it's best to repaint the entire door.

1 Remove paint around the dent with a wire wheel. Roughen the bare metal with 60- or 80-grit sandpaper.

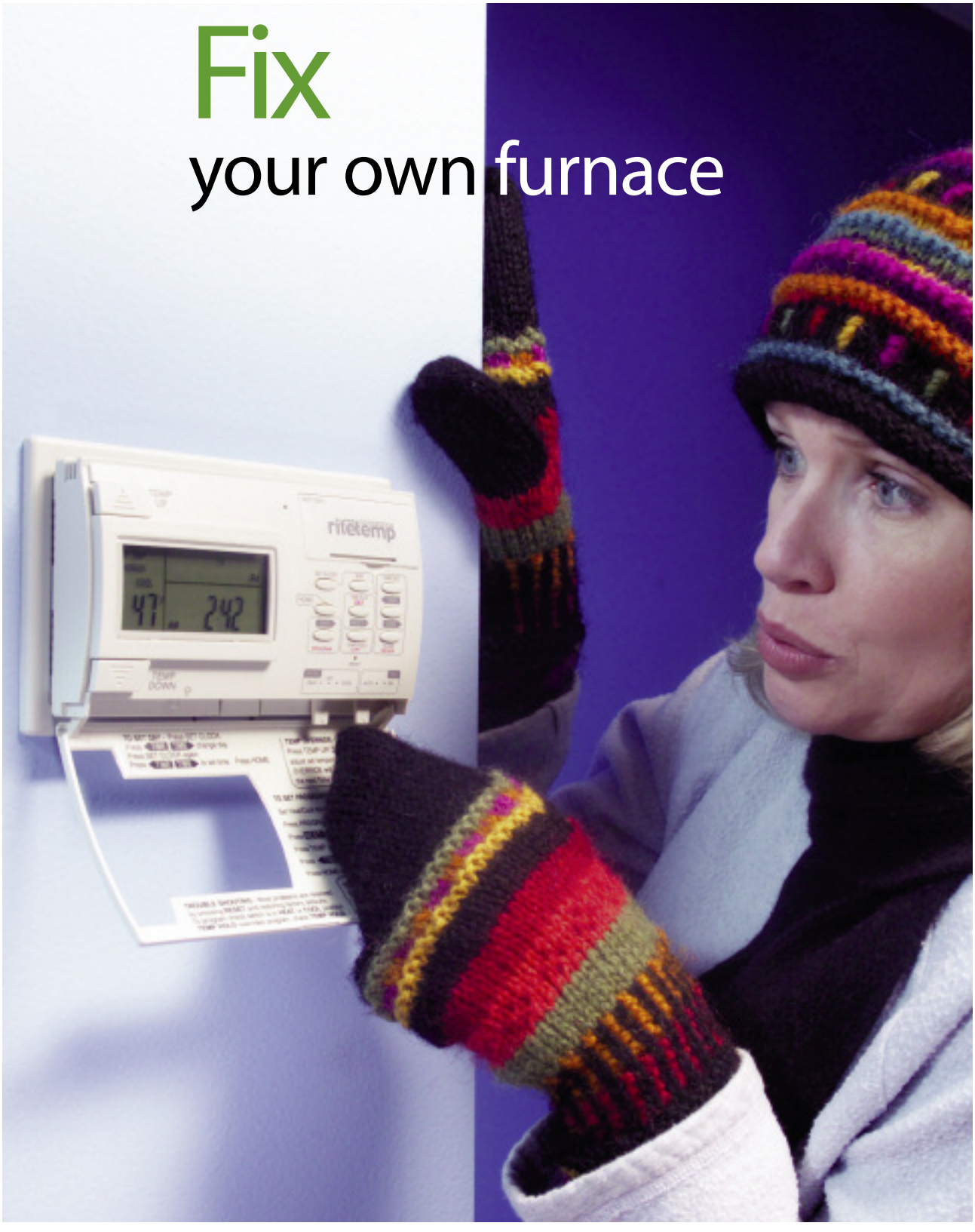


2 Mix auto body filler and fill the dent using a wide putty knife. Avoid leaving humps or ridges. If necessary, add more filler after the first layer hardens.

3 Sand the filler smooth with 100-grit paper. Use a sanding block to ensure a flat surface. Prime the repair and paint the entire door.

tip If the damage is near the bottom of the door, you can skip the repair and cover it with a metal kick plate ($25 at home centers and hardware stores). Kick plates are about 8 in. wide and come in lengths to match standard doors.

Fix your own furnace



A furnace can be intimidating—especially when it's not working. However, there is good news. Roughly a quarter of all service calls can be avoided with easy fixes that cost little or nothing.

Here you'll learn about the common culprits and what to do about them.

CAUTION:
Always turn off the shutoff switch (see No. 2 on p. 69) and turn the thermostat off or all the way down before changing the filter or working on the thermostat or furnace.

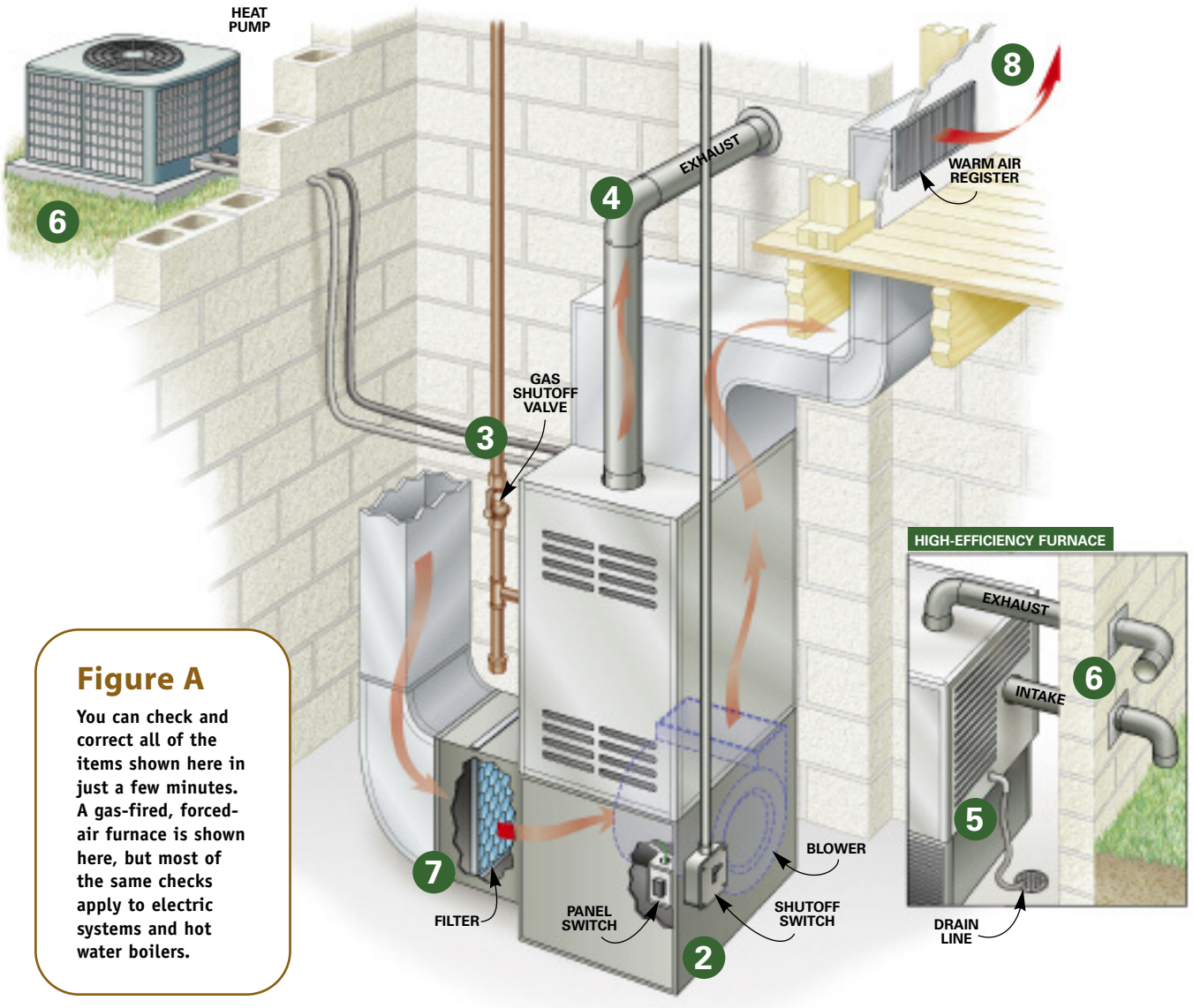


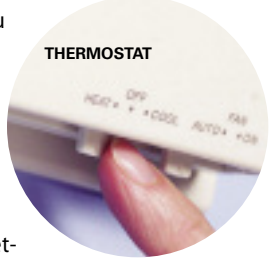
Figure A

You can check and correct all of the items shown here in just a few minutes. A gas-fired, forced-air furnace is shown here, but most of the same checks apply to electric systems and hot water boilers.

1 Check the thermostat to make sure it's on

Before you assume you have a furnace problem, check the thermostat to make sure it's actually telling the furnace to come on. Thermostats, especially programmable ones, can be complicated, and the more options a thermostat has, the more that can go wrong.

- Make sure the switch is on "Heat" rather than on "Cool."
- Check the temperature setting.
- Compare the temperature setting to the room temperature. Set the temperature five degrees higher than the room temperature and see if the furnace kicks on.
- Make sure the program is displaying the right day and time, as well as a.m. and p.m. settings.
- Trace the thermostat wires back to the furnace to check for breaks, especially if you've done any remodeling recently. If you find a break in one of the thin wires, splice the line back together and wrap it with electrical tape.
- Replace the battery. If you have a power outage with a dead battery, you'll lose your settings and the thermostat will revert to the default program.
- Open the thermostat and gently blow out any dust or debris. Make sure the thermostat is level and firmly attached on the wall, and that none of the wires coming into it are loose.
- If you can't make the program settings work, you can bypass them altogether. Simply punch in the temperature you want with the up/down control and then press the hold button. That will switch on the furnace if the thermostat programming is the problem.



tip Lost your owner's manual? Most major-brand manuals are on the Web—just go to the manufacturer's Web site.

2 Check shutoff switches and breakers

It sounds unbelievable, but furnace technicians often find that the only "repair" a furnace needs is to be turned on. Look for a standard wall switch on or near the furnace—all furnaces, no matter what age or type, have one somewhere. Check the circuit breaker or fuse for the furnace as well. Make sure the front panel covering the blower motor is securely fastened—there's a push-in switch under it that must be fully depressed for the furnace to operate.

3 Make sure the gas is on

Just as with switches, someone may have turned off a gas valve and then forgotten to turn it back on. Trace the gas line back from the furnace to the meter, and if you see a handle that's perpendicular to the gas pipe, turn it so it's parallel.

If you have an old furnace or boiler, you may have a pilot light. Remove the front panel and the burner cover and check to make sure it's lit.

4 Make sure the chimney exhaust flue is clear

Drawn by the warmth, birds sometimes fall into the chimney exhaust flue. Turn the furnace off and the thermostat all the way down, then dismantle the duct where it exits the furnace and check for debris. Be sure to reassemble the sections in the same order and direction that you took them out.

5 Flush out drain lines

High-efficiency furnaces can drain off several gallons of water a day in heating season. If the drain lines become restricted by sediment or mold growth, the furnace will shut down. If the drain hose looks dirty, remove the hose, fill it with a mixture of bleach and water (25 percent bleach), then flush it after several minutes.

7 Change filters

Dirty filters are the most common cause of furnace problems. Dust and dirt restrict airflow—and if the filter gets too clogged, the heat exchanger will overheat and shut off too quickly, and your house won't warm up. If the blower is running but no heat is coming out, replace the filter. A dirty filter also causes soot buildup on the heat exchanger, reducing the efficiency of the furnace and shortening its life.

The owner's manual shows where the filter is and how to remove it. Change inexpensive flat filters at least once a month. Make sure that the arrow points toward the furnace. Inspect pleated filters once a month. Hold them up to the light and if you can't see the light clearly through them, replace them. Manufacturers say pleated filters are good for three months, but change them more frequently if you have pets, kids or generate lots of dust.

8 Look for blocked or leaky ducts that restrict airflow

If your furnace comes on but one or two rooms are cold, first make sure all the room registers are open. Then examine any ductwork you can get access to and look for gaps between sections or branching points. Seal any gaps between sections of duct with special metal duct tape. Don't use standard cloth duct tape—it quickly deteriorates, and it may also cause ducts to leak if it was used to seal sections in the past.

Also check for handles protruding from the ductwork. These are dampers or air conditioner bypasses—make sure they're open.

6 Clean away leaves and debris from heat pumps or intake and exhaust vents

If you have a furnace that vents out the side of the house, make sure nothing is blocking the intake or exhaust. If either of the pipes is covered with screen mesh (like window screen), replace it with 1/2-in.-mesh hardware cloth. If ice is clogging one of the pipes, you have a bigger problem somewhere in the system. Clear it off and call a technician to find out why it's happening.

If you have a heat pump, clear away grass and leaves from the fins of the outdoor compressor unit. Before heating season starts, hose it down gently from the top to rinse dirt and debris out of the housing.

Repair a **drywall crack**

As homes settle, cracks may radiate from the corners of doors and windows. Whether your walls are made of plaster or drywall, you can repair the cracks in two steps over a day or two—and get the area ready to sand and paint. Use paper tape; it's stronger than fiberglass tape for wall repairs. For cracks more than 1/4 in. deep, clean out the loose material and use a quick-setting crack filler like Durabond to build up the area level with the wall. Then use the steps shown in Photos 2 and 3 to fix it.

1 Cut a V-notch through the full length of the crack, 1/8 to 1/4 in. deep, removing all loose wall material. Protect woodwork with masking tape.

2 Embed paper tape in joint compound using a 6-in. taping blade. To avoid trapping air bubbles under the tape, moisten the paper tape with water, lay it over the crack and squeeze excess compound and air from underneath with the blade. Apply an additional thin layer of compound and feather it off 2 in. on both sides of the tape. Let dry.

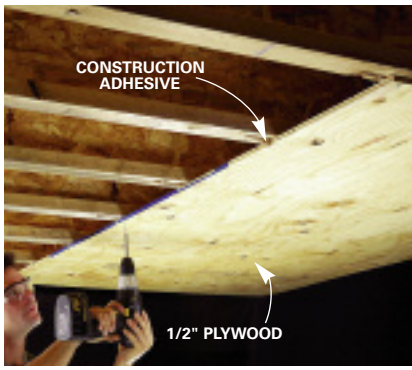
3 Apply a second (and third, if necessary) coat of compound, smoothing it out 6 to 7 in. on both sides of the joint. Smooth the compound to a thin, even coat using long, continuous strokes with a 12-in. taping blade. Allow the repair to dry thoroughly, sand it smooth (avoid exposing the tape) and paint it.

Solutions for a **bouncy floor**

Assuming you have access to the underside of your floor joists, you can install either bridging or a layer of plywood to reduce the bounce in your floor. Try bridging first. Simply nail short I-joist sections between your existing joists (Photo 1). To prevent squeaks, apply construction adhesive to the top side of the bridging where it contacts your floor. If the joist span is shorter than 14 ft., install one row of bridging at the midpoint. If the span is longer than 14 ft., install two rows of bridging, one at one-third of the span and the other at two-thirds of the span.

If the floor is still too bouncy, glue and screw 1/2-in. plywood to the bottom of the joists (Photo 2). Start the first row at a corner, then stagger subsequent rows so the seams don't fall on the same joists. The drawback to this method is that you have to leave ceiling access to plumbing and gas valves, electrical boxes and other fixtures.

1 Toenail a line of I-joist blocks between the joists across the full length of the room.



2 Fasten 4 x 8-ft. sheets of 1/2-in. plywood to the underside of the I-joists with 1-1/2-in. screws.

Replace a **sink sprayer** and **hose**

Over time, sink sprayers often break or become clogged with mineral deposits. Or the sprayer hose can harden and crack or wear through from rubbing against something under the sink. The best solution in these cases is replacement.

You can pick up just the sprayer head ($5) or a head and hose kit ($10) at a home center or hardware store.

Photo 1 shows how to remove the entire sprayer head and hose assembly. You may be able to get a small open-end wrench up to the sprayer hose nipple, but space is very tight. If there isn't enough room to turn the wrench, you'll have to purchase a basin wrench ($15 to $25 at home centers and hardware stores). If your sprayer hose is in good condition, simply unscrew the head and replace it (Photo 2).

1 **Use an open-end or basin wrench to unscrew the sprayer hose from the hose nipple. Pull the old sprayer and hose out of the sink grommet. Slide the new hose through the grommet on top of the sink and reconnect it to the faucet.**

2 **Hold the base of the sprayer in your hand and twist off the sprayer head. Screw on the new head.**

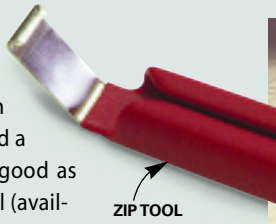
Relocate a **sprinkler head**

Decide where you want to relocate the sprinkler head. You can move it up to 4 ft. with flex pipe (available at plumbing and irrigation supply stores) without affecting performance. Dig an 8- to 12-in.-deep trench from the current head location to the new location. Turn off the irrigation system at the controller. Unscrew the sprinkler head from the riser (Photo 1) and then unscrew the riser. Insert a flex pipe elbow into the existing combination elbow or riser tee. Tighten the elbow until it's hand-tight. Then attach a 3/8-in. flex pipe to the flex pipe elbow by sliding it over the nipple (the flex pipe has a smaller diameter than the water line pipe). The connection doesn't require clamps.

Fasten a flex pipe elbow to the other end of the pipe. Place the sprinkler head on the elbow, then turn it until it's hand-tight. Hold the sprinkler head in the location you want it. The top of the head should be at ground level. Backfill around the head with your free hand (Photo 2). Once the head is secure, fill in the trench and replace the sod.

Note: Before you do any digging, call the North American One-Call Referral System at (888) 258-0808 to have someone mark underground gas, electrical, water and telephone lines.

Replace damaged vinyl siding



Vinyl siding is tough, but not indestructible. If a falling branch or a well-hit baseball has cracked a piece of your siding, you can make it as good as new in about 15 minutes with a $5 zip tool (available at any home center) and a replacement piece of siding. It's as simple as unzipping the damaged piece and snapping in a new one.

Starting at one end of the damaged piece, push the end of the zip tool up under the siding until you feel it hook the bottom lip (Photo 1). Pull the zip tool downward and out to unhook the bottom lip, then slide it along the edge, pulling the siding out as you go. Then unzip any pieces above the damaged piece. Hold them out of the way with your elbow while you pry out the nails that hold the damaged piece in place (Photo 2).

Slide the replacement piece up into place, pushing up until the lower lip locks into the piece below it. Drive 1-1/4-in. roofing nails through the nailing flange. Space them about every 16 in. (near the old nail holes). Nail in the center of the nailing slot and leave about 1/32 in. of space between the nail head and the siding so the vinyl can move freely. Don't nail the heads tightly or the siding will buckle when it warms up.

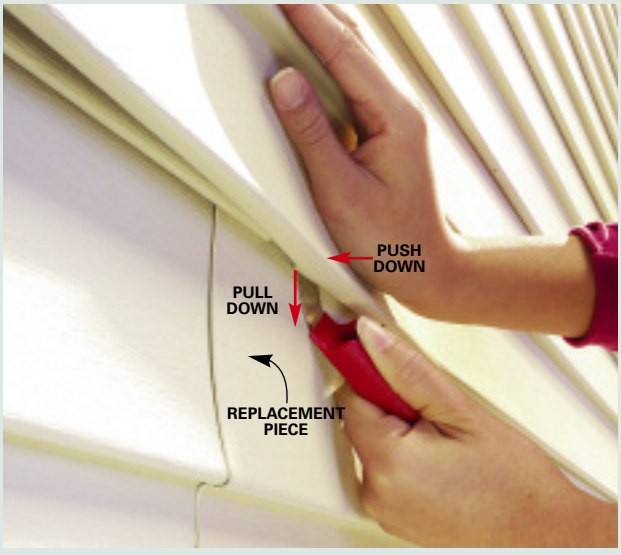
With the new piece nailed, use the zip tool to lock the upper piece down over it. Start at one end and pull the lip down, twisting the tool slightly to force the leading edge down (Photo 3). Slide the zip tool along, pushing in on the vinyl just behind the tool with your other hand so it snaps into place.

It's best to repair vinyl in warm weather. In temperatures below freezing it becomes less flexible and may crack.

1 **Slide the zip tool along the bottom edge to release the vinyl siding from the piece below it.**

The downside of replacing older vinyl siding is that it can be hard to match the style and color, and siding rarely has any identifying marks. The best way to get a replacement piece is to take the broken piece to vinyl siding distributors in your area and find the closest match. If the old vinyl has faded or you can't find the right color, take the broken piece to a paint store and have the color matched. Paint the replacement piece with one coat of top-quality acrylic primer followed by acrylic house paint—acrylic paint will flex with the movement of the vinyl.

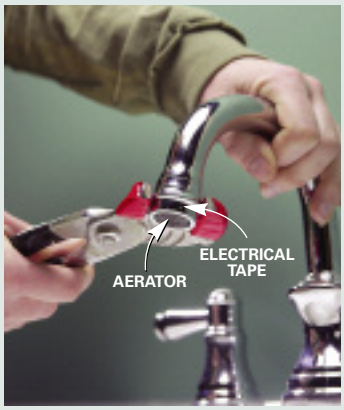
2 **Slip a flat bar behind the damaged piece of vinyl siding and pry out the nails.**



3 **Install the replacement piece and hook the lip of the upper siding piece into the slot to lock it into place.**

Unclog a **faucet**

If the flow from your kitchen or bathroom faucet isn't what it used to be, the aerator is probably plugged. An aerator can clog slowly as mineral deposits build up, or quickly after plumbing work loosens debris inside pipes. Usually, a quick cleaning solves the problem. Remove the aerator (Photo 1) and disassemble it. You may need a small screwdriver or knife to pry the components apart. Scrub away any tough buildup with an old toothbrush (Photo 2) and rinse each part thoroughly (be sure to close the drain stopper). Gunk can also build up inside the faucet neck, so ream it out with your finger and flush out the loosened debris.



1 Wrap the pliers' jaws and the aerator with electrical tape and unscrew the aerator. Close the stopper so the small parts can't fall down the drain.

If the mineral buildup resists scrubbing and you have a standard cylinder-shaped aerator, you can replace it (about $5). Take your old aerator along to the home center or hardware store to find a match. If your aerator has a fancy shape (like the one shown here), finding a match won't be as simple. So try this first: Soak the aerator parts in vinegar overnight to soften mineral buildup. If that doesn't work, go to any online search engine and type in the brand of your faucet followed by "faucet parts." With a little searching, you can find diagrams of your faucet and order a new aerator. Expect to spend $10 or more for a nonstandard aerator.

2 Disassemble the aerator and lay out the parts in the order you remove them to make reassembly foolproof. Scrub the parts and reassemble them.

Remove tough stains from **vinyl flooring**

Sheet vinyl "resilient" flooring is so easy to clean that it may never require anything beyond damp mopping with a cleaner intended for vinyl floors. But if your floor has marks or stains that still won't come off, you can use stronger stuff. Although the methods described here won't harm most vinyl floors, test them first in a closet or on a section of flooring that's hidden by furniture. Use white rags only; chemicals that dissolve stains can also make fabric colors bleed and stain your floor.

Isopropyl alcohol, sold as a disinfectant at drug stores ($4), is a mild solvent. It's the best cleaner for heel marks and works on other tough stains too. You can also use lighter fluid or mineral spirits. Remember that all these products are flammable; turn off any nearby pilot lights and hang rags out to dry before throwing them away.

Bleach will often erase stains left by liquids like fruit juices, tomato sauce and wine. Mix one part household bleach with four parts water, soak a rag in it and lay the rag over the stain. Bleach works slowly; you may have to leave the rag in place for an hour or so.

Oxalic acid is the solution for stubborn rust stains. It's often labeled "wood bleach"—but not all wood bleach contains oxalic acid, so check the label. Most paint stores and some hardware stores carry oxalic acid ($7). If the stain won't rub off, wet a rag with the acid solution and lay it over the stain for 10 minutes. If the stain remains, rewet the rag and repeat. When that's done, rinse the floor with clean water.

1 Dampen a white rag with isopropyl alcohol and rub away heel marks.

2 Mix oxalic acid powder with water and dab rust stains to remove them. Protect your hands with rubber gloves and open a window for ventilation.

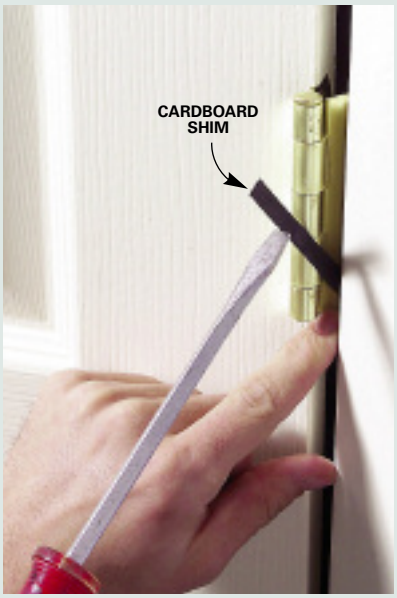
Turn threshold screws to seal out **drafts**

Those big screwheads in the threshold of a newer entry door aren't just decorative; they raise or lower a narrow strip set in the threshold. So if you've noticed a draft under the door, try this: On a sunny day, turn off the lights and close nearby curtains. Lie down and look for daylight under the door. A sliver of light sneaking in at both corners of the door is normal. But if you see light between the threshold and the door, grab your screwdriver. Raise the threshold where light enters by turning the nearest screws counterclockwise. Set a straightedge (such as a framing square) on the threshold and adjust the other screws to make sure the adjustable strip is straight. Close the door and check for light. Readjust the threshold until you've eliminated the light. But don't raise the threshold so high that it presses too hard against the weatherstripping on the door. A too-tight fit will wear out the weatherstripping quickly.

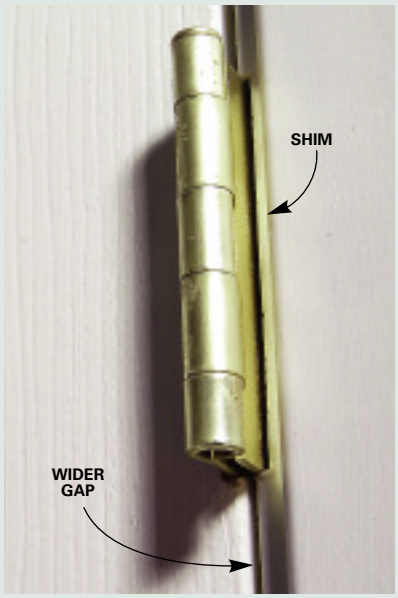
Shim **gapping doors**

If you have big gaps along the latch side of your doors, they were probably prehung in their frames at the factory and installed as a unit. The installer should have adjusted the frame with shims to leave about a 1/8-in. gap along the latch side, about the thickness of two quarters (coins). Sometimes the gap is far too wide.

To readjust the door frame, you have to remove the trim along the latch side to get at the shims. This job can be a hassle, especially if you have painted trim. So try this trick first. Slip a 1/16-in.-thick cardboard strip behind each hinge (Photos 1 and 2). This will widen the gap along the hinge side and narrow the gap along the latch side. Hopefully, it'll be enough to make the latch solid.



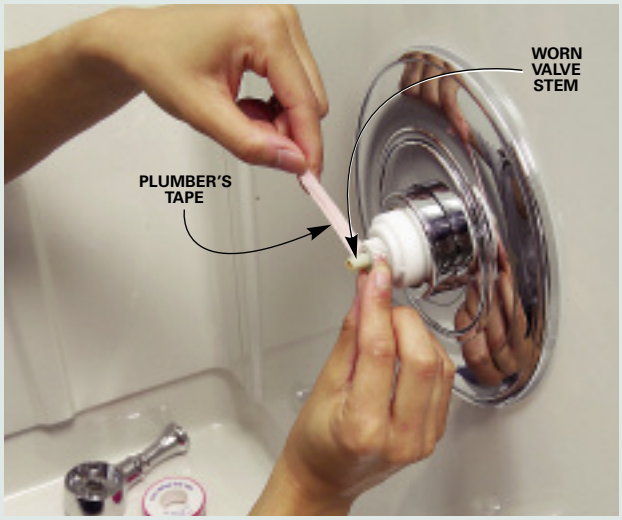
1 Loosen the hinge screws in the jamb and insert a 1/16-in.-thick x 3/8-in.-wide piece of cardboard behind the hinge leaf. Push it against the screws and retighten them.



2 Follow the same procedure for each hinge. The gap along the hinge side should open about 1/16 in. and narrow the gap on the latch side.

Tighten a floppy **faucet handle**

If you have a loose valve handle—on a shower, bathroom or kitchen faucet—tighten the screw that holds the handle in place. With some faucets, you'll have to pry off the metal button at the center of the handle. With others, you'll find a setscrew near the base of the handle. Setscrews usually require a hex (or "Allen") wrench. If tightening doesn't work, the stem inside the handle may be worn, especially if it's plastic. Here's a trick to tighten worn stems on most types of faucets: Wrap the stem tightly with Teflon pipe thread tape and slip the handle back over the stem. In most cases, a single wrap creates a snug fit.



Fix bad **wallpaper** seams

Repairing loose seams is fairly simple and doesn't require a steamer. Just apply a seam repair adhesive. It provides a solid bond and will keep the seams from coming loose. It's available at paint stores and home centers for less than $10.

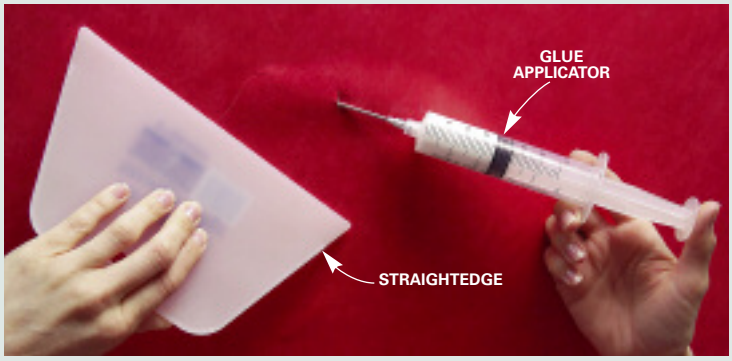
Squirt the adhesive directly onto the wall behind the loose seams, then press the edges back into place. Use a roller or straightedge as shown to firmly press the paper against the wall and drive out any air bubbles. Wipe away any excess adhesive with a damp sponge.

Straighten bubbling **wallpaper**

Fix the bubbles by cutting them with a razor knife. A small slit is all that's needed. Then insert the end of a glue applicator in the slit and squeeze in a little adhesive (see photo).

Wipe away excessive adhesive with a damp sponge and press the wallpaper against the wall to force out the air, using a plastic straightedge.

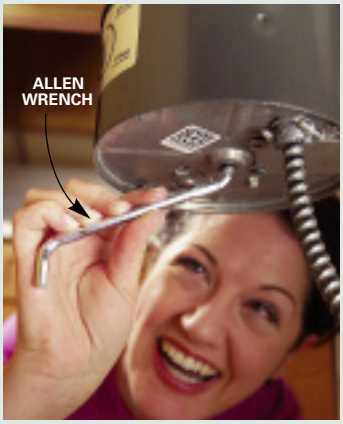
The glue applicators and proper adhesive are available at paint stores and home centers for less than $10.



Push-button **disposer** fix

If your disposer won't start, push the reset button and give it a spin. All disposers have an overload feature that automatically shuts off the power when the motor becomes overloaded and gets too hot. Once the motor cools, simply push the reset button on the side of or under the unit (photo left).

On the other hand, if it hums but doesn't spin, it may have something stuck in it. Switch the disposer off, then try working through it by turning the blades with a special disposer wrench ($10 at home centers) or by turning a bottom bolt (photo right). Many disposers have an Allen wrench for that purpose, inset on the bottom of the machine.



Reset the **GFCI**

If the circuit breaker hasn't tripped and your appliance isn't working, look for a tripped GFCI. When a light goes out or a switch doesn't work, first check the main electrical panel for a tripped circuit breaker. But don't stop there. Before you change out lightbulbs and switches, see if a GFCI outlet (which may be upstream from the troubled light or outlet) has tripped. Sometimes all the bathrooms or the outside lights are powered through a single GFCI located in one bathroom or elsewhere, such as in a basement. Simply push the reset button on the GFCI and you could be back in business.

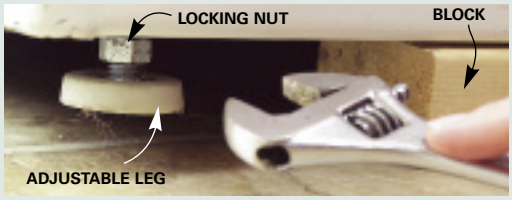
Clean the **dishwasher** filter

When your dishwasher no longer gets your dishes clean, a food-filled filter is most often to blame. If it's clogged, water can't make it to the spray arms to clean the dishes in the top rack. The fix takes two minutes. Simply pull out the lower rack and remove the filter cover inside the dishwasher. (Check your owner's manual if you can't spot the filter.) Then use a wet vacuum to clean off the screen.

While you're there, slide the nearby float switch up and down. If it's jammed with food debris, you won't get any water. If the cover sticks, jiggle it up and down and clean it with water.

Quiet a noisy **washer**

When a washing machine cabinet rocks, it makes a horrible racket during the spin cycle. The solution is to simply readjust the legs. Screw the front legs up or down until the cabinet is level. When both legs are solid on the floor, tighten each leg's locking nut. In most washers, to adjust the rear legs, gently tilt the machine forward and gently lower it down. The movement will self-adjust the rear legs.

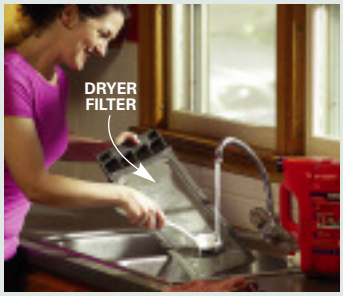


Change the **dryer filter**

If your clothes are damp after a normal cycle, check the dryer setting—make sure it's not on "fluff air," a non-heat setting.

Another common cause of poor drying is a clogged lint filter. The filter may look clean, but it may actually be covered by a nearly invisible film caused by dryer sheets. This film reduces airflow and forces the thermostat to shut off the heat before your clothes are dry. Pull out the filter and scrub it in hot water with a little laundry detergent and a stiff kitchen brush.

Also check the outside dryer vent for any lint that may have built up there. The louver door–style vent covers are notorious for lint buildup, which traps heat and turns the heat off in the dryer. Pull the cover completely off to get to these clogs.



Change the air conditioner **thermostat**

If you turn your central air conditioner on, off and then on again in rapid order, chances are you'll blow a fuse or shut off a circuit breaker or the air conditioner simply won't respond. That's because the compressor (in the outdoor condensing unit) may have stopped in a high compression mode, making it difficult to start until the compression releases. Older condensing units may switch the compressor on anyway, which causes the circuit to overload and blow a fuse. Newer, "smarter" condensing units will prevent this blunder by delaying the AC's "on" function for a few minutes. It's easy to mistake this delay for a faulty air conditioner. Be patient and give the air conditioner about five minutes to come back on.

To determine if you have a blown fuse, locate the special fuse block near the outside unit. Pull out the block and take the whole thing to the hardware store. A salesperson can test the cartridge fuses and tell you if you need to replace them.

Another simple reason your AC might not come on: You've signed up for a cost discount with your electric company in exchange for limited air conditioning during high-demand periods, and you're in an "off" period. If you can't remember, call your electric company to find out. You don't want to pay the repair technician to drive out and explain this program to you!

Lubricate sticking **drawers**

Candle wax is a handy lubricant for old drawers or any furniture that has wood sliding against wood. Just rub a candle hard against the skids under the drawer. Rub the tracks inside the chest or cabinet too.

Lubricate sticking **locks**

If your lock turns hard or your key doesn't slide in smoothly, the lock might be worn out. Then again, it may just need lubrication. Squirt a puff of powdered graphite into the keyhole. Unlike liquid lubricants, graphite won't create sticky grime inside the lock. A tube costs about $3 at home centers.

Maintenance and fixes

Dealing with leaks, repairs and appliance breakdowns is part of owning a home. But you don't have to pay big bucks for professional repair services. In this section, repair experts reveal super-easy fixes (like flipping on a switch!) that they regularly charge for. You'll also find expert advice for common plumbing repairs around the house.

- Top ways to cut repair costs
- Reglue loose laminate
- Stop leaks in plumbing joints
- Repair drippy showers
- Repair a washer-type faucet
- Repair an outdoor faucet
- Overhaul a toilet tank
- Unclog a sink drain
- Unclog a bathroom drain
- Replace a tub spout
- Tighten a floppy faucet handle
- Replace a water pipe section
- A trick for splicing in plastic drainpipe
- Simple solution for a troublesome light fixture

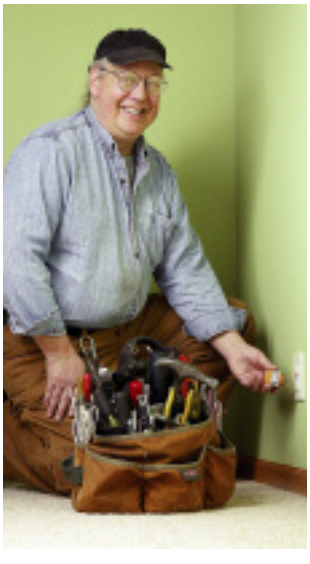
SPECIAL SECTION:
Use tools like a pro

- Pros' favorite shop tools
- Shop tips from a pro

Top ways to cut repair costs

On the following pages, the repair experts below provide examples of repairs they make that frankly are so simple that they feel bad charging for them. Many of the fixes they suggest are simple things that you may have just overlooked. Other solutions are less obvious. Of course, there are times when you must rely on the pros to get the job done. But if you follow the advice here, you may be able to save a big chunk of change the next time something goes wrong.

The Pros



Al Hildenbrand

Al has a bachelor of science degree in electrical engineering and a master electrician's license. An electrical contractor for 30 years, he has his own company, Al's Electric Works.

Costas Stavrou

Costas graduated from technical college with a degree in refrigeration, air conditioning and major appliance repair. He has run his own company, CSG Repair, since 1982.

Les Zell

Les, the owner of Zell Plumbing and Heating, got his start in the U.S. Navy Construction Battalion. Then he went on to become a journeyman and finally a master plumber.

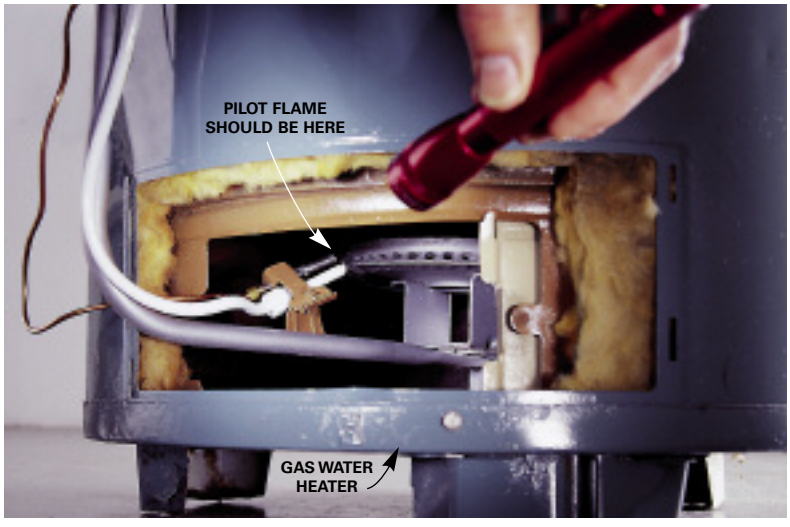
Bob Schmahl

Bob has 32 years' experience in the heating and air conditioning business. He worked as a journeyman until he got his Master Warm Air Venting & Heating license in 1987.

Before you call the plumber

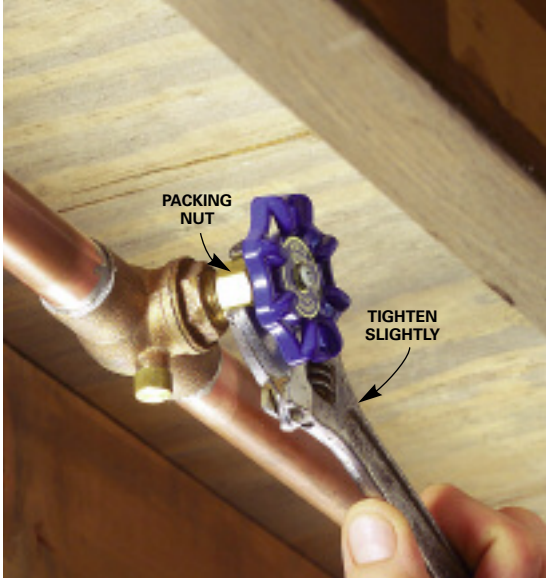
"You'd be surprised how often we get calls complaining about no water or a lack of pressure, and then show up to discover something simple like a water valve that's shut off or a plugged faucet aerator."

–Les Zell



No hot water? Check the pilot light

Les says you'd be surprised how often he has to charge for a service call just to relight a water heater pilot light. So before you call the plumber, remove the metal cover located at the bottom of the water heater or simply look through the glass door to see if the pilot is lit. If you don't see a small pilot light flame, follow the instructions for relighting the pilot on the label pasted to the tank. Some high-efficiency water heaters don't have a pilot light that stays lit all the time. If you have one of these, check your owner's manual before you reach for the phone.

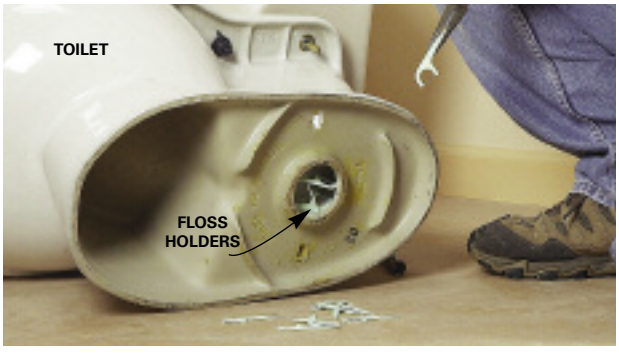


Got a leak?

Plumbers say that leaks are one of the most common complaints they get. Valves are one of the main culprits because they have moving parts and seals that can wear out. The next time you see a suspicious puddle of water, look for a leaky valve before you call the plumber. Look at the valve to see if water is leaking out around the valve stem. If it is, try turning the packing nut (photo above) about an eighth turn with a wrench. You'll know if you overtighten the nut because the valve will be hard to turn. If tightening the nut doesn't stop the leak, the fix is a little tougher. You'll have to shut off the main water valve, remove the handle and nut, and add to or replace the packing material—still a pretty easy fix.

"Your toilet's not a garbage can"

Les got a call to unplug a toilet he had recently installed. He was surprised because he had put in a toilet that he knew was almost impossible to clog. After repeated attempts with a plunger and a toilet auger, he gave up and removed the toilet to look in from the bottom. The outlet was completely clogged with a tangled web of plastic dental floss holders, which had to be removed one at a time with needle-nose pliers. Save yourself a service call. Use the wastebasket for garbage.



Low water pressure at the faucet?

Over time, aerators get clogged with minerals or other bits of stuff that break loose from the inside of the pipes. Remove the aerator by turning it clockwise when you're looking down on it. You may have to grip it with pliers to unscrew it. Once it's off, you can take the parts out of the aerator and clean them, but it's usually better to simply replace it. Take it along to the hardware store to find an exact thread match.

Before you call for an appliance repair

"The No. 1 thing for all appliances is to check the power first. In other words, is the breaker off, or did someone unplug the appliance to plug in a drill or something. Seriously, it's happened a million times. I'll go over there, plug in the appliance and say I'm really sorry, but I'll still have to charge you." — *Costas Stavrou*

Refrigerator not cooling?

It could be as simple as turning the dial to a cooler setting. Check the controls. Costas says it's not uncommon to find that the refrigerator controls are set wrong. Someone may have bumped the dial while putting away the milk or an inquisitive toddler may have twisted the knob.

Cooling coils completely caked with pet hair and dust are also incredibly common. Remove the front grille and vacuum the coils.

Water coming out of the dishwasher?

Costas says a leak, and an unusual whooshing sound coming from the dishwasher, are sure signs that someone used regular dishwashing liquid rather than dishwasher detergent, which is low sudsing. Costas squirts a bit of defoaming solution, typically used in carpet shampoo machines, into the dishwasher. But you can rinse all of the detergent from the dishwasher by repeatedly adding a gallon of water and running the dishwasher on the drain cycle.

Is your freezer full of frost?

That's a sure sign that the freezer door is ajar. All it takes is one too many cartons of ice cream to hold the door open a crack. Rearrange the freezer contents so the door closes completely and you may save $60 on a service call.

Washer not filling?

When Costas gets a call about a washing machine that's not filling with water, the first thing he asks is whether the water valves leading to the machine are open. If your washer isn't filling, check to make sure the water is on before you call for service.

No flame at the burners?

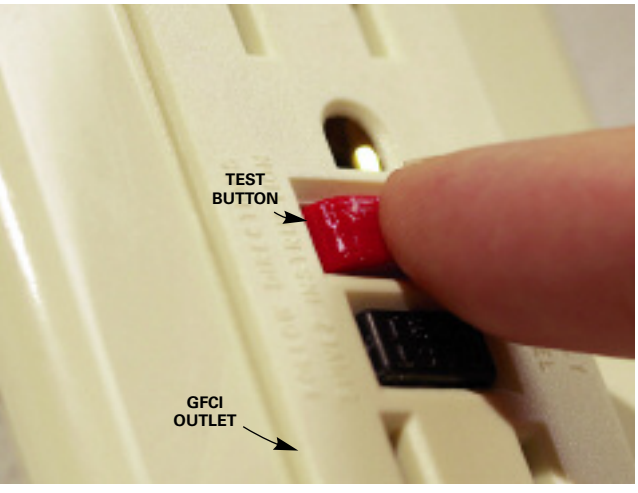
- If you don't hear gas coming out when the burner is turned on, gas isn't getting to the stove. Check to make sure the gas is turned on.
- If you hear gas coming out but the burner won't light, make sure the stove is plugged in. Even gas stoves need power.
- If the stove is getting gas and has power, clean the igniter near the burner or clean out the pilot light hole.

Electric stove burner not heating?

The first thing Costas asks is, "Did you clean the stove recently?" Usually the answer is yes, and the fix is easy. When you slid the burner back into the top, the terminal didn't engage with the receptacle under the stove top or the plastic terminal block got knocked out of its holder. Lift the stove top to see what the problem is. The fix usually involves reinstalling the terminal block. Also try spreading the terminals slightly to create a tighter connection.

Before you call an electrician

"I can diagnose about 30 percent of electrical problems over the phone. I play a game of '20 Questions' to see if I can avoid making a trip to the house." — *Al Hildenbrand*



Here are some of the most common complaints Al Hildenbrand gets, and the questions he asks.

"I screwed in a new fuse but I still don't have any power."
Are you sure you used the same amperage fuse as the one you replaced? Is the fuse good? Is it screwed in tight?

"I've checked the circuit breakers, but the outlet still doesn't work."
Some outlets are protected by upstream GFCIs or GFCI circuit breakers. Look in the circuit box for a GFCI circuit breaker and in bathrooms, kitchens and laundry rooms for GFCI outlets. Test and reset them. This may solve your problem.

"I replaced the lightbulb but the light fixture still doesn't work."
Are you sure the new bulb is good? Try it in another light fixture and make sure it's screwed all the way in.

"This outlet used to work. Now it's dead."
Check all the switches in the room. One of them might control the outlet.

Before you call about heat or air conditioning

"We always ask, 'Is the furnace switch turned on?' You'd be surprised how many times someone in the house accidentally switches the furnace off."
— *Bob Schmahl*

Furnace quit?

If you live in an area with snow and have a furnace that vents out through the side wall, make sure the vent pipes aren't plugged with frost or snow. Plugged vents cause the furnace to shut off automatically. Once you've unplugged the vents, reset the furnace by switching off the power: Either turn off the switch located on or near the furnace, or flip the circuit breaker that controls the furnace. Wait a minute, then switch the power back on.

Not getting enough heat?

Check the furnace filter. Bob Schmahl says, "When I ask people when's the last time you changed the furnace filter and they give me that deer-in-the-headlights stare, I know what the problem is."

One of the most common causes of insufficient heat or cooled air is a plugged furnace filter. Change inexpensive woven fiberglass filters once a month or buy a better-quality pleated filter and change it every three months to avoid heating and cooling problems.

Another common cause of cold rooms during heating season is a blocked cold air return. Be sure your couch or an area rug isn't covering a cold air return vent because this can slow the entry of heated air into the room.

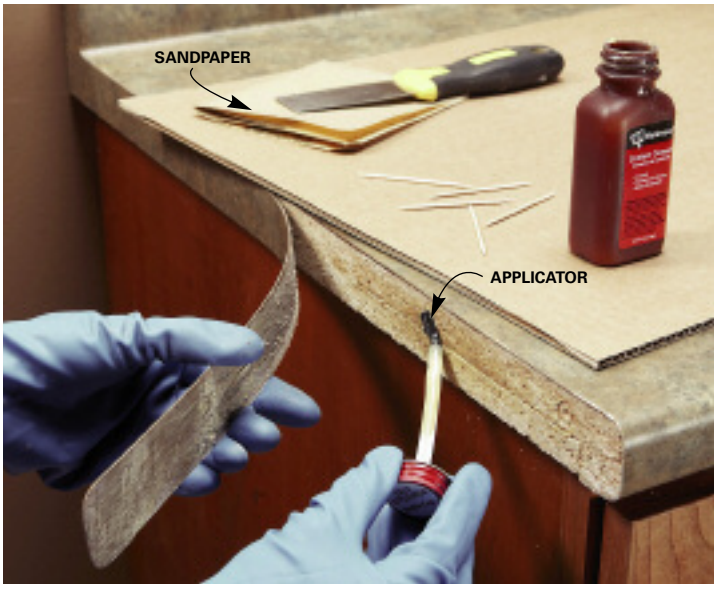
Reglue loose laminate

End caps and other laminate edges sometimes come loose and can get broken off if not reglued, but as long as the particleboard backer is in good condition, the fix is simple.

Scrape off chunks of debris or dried lumps of glue from the end cap. If the countertop is newer, first try to iron the end cap back on with a medium-hot iron to reactivate the glue. However, in most cases the loose piece will need to be reattached with contact cement.

Sand rough areas with medium-grit sandpaper, then apply the contact cement (Photo 1). Open nearby windows to dissipate the fumes from the glue. After both sides are completely coated, keep them separated with a toothpick (Photo 2) until the adhesive is tacky. Carefully rejoin the two sides, starting at the back of the glued area (Photo 3). Contact cement bonds instantly, and if the wrong areas accidentally touch, you'll have great difficulty pulling them apart.

Finally, rub away any dried glue around the edges with your finger. (**Note:** If your end cap has broken, scrape it off and take a piece to a home center to find a matching replacement piece.)



1 **Spread contact cement on with the applicator or a disposable natural-bristle brush, covering all edges.**

2 **Keep the two sides separate until the glue is dry but still a little tacky—usually in about 20 minutes.**

3 **Align and then push the laminate edge back against the particleboard, applying pressure with a smooth block of wood for a good bond.**

Stop leaks *in plumbing joints*

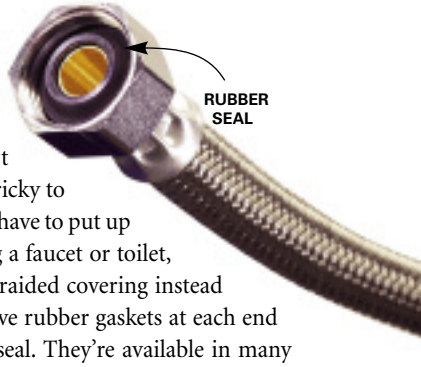
Align slip joints precisely for a tight seal

Joints on chrome trap assemblies rely on rubber slip joint washers for the seal, which often leak. If you're reassembling a chrome trap, buy new slip joint washers and nuts. However, new washers sometimes stick to the pipe, causing them to twist or distort as you push them tight with the slip joint nut. To avoid this, lubricate the drain tubing and slip joint with a little pipe joint compound (Photo 1). The compound helps the washer slide smoothly and creates a tighter seal.

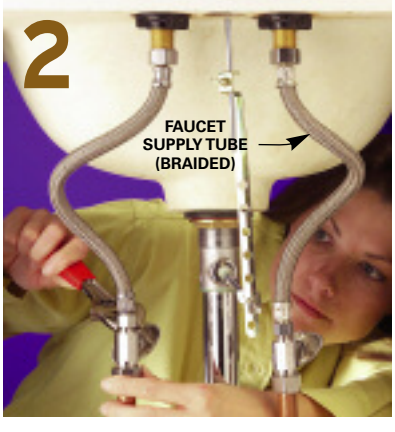
Start the slip joint nut by hand, and twist it on until the threads are engaged correctly. Hand-tighten all joints first (Photo 2). Then adjust the trap parts until they're aligned and pitched slightly for drainage. This is key; a misaligned joint will leak, even with new washers. Finally, use a large slip joint pliers to tighten the nuts an additional half turn.

Plastic trap parts use hard plastic slip joint washers for a seal. Make sure the flat part is against the nut with the tapered side facing the fitting.

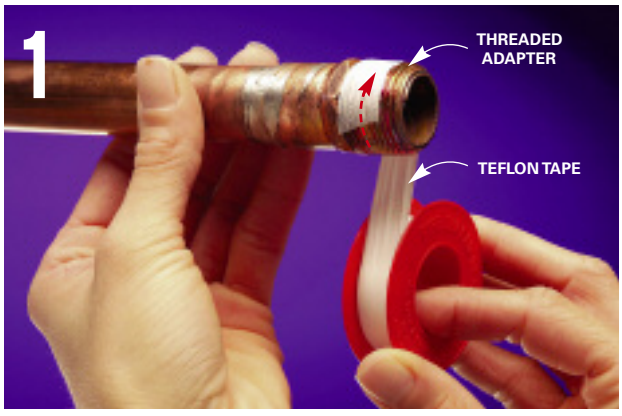
Choose flexible supply tubes

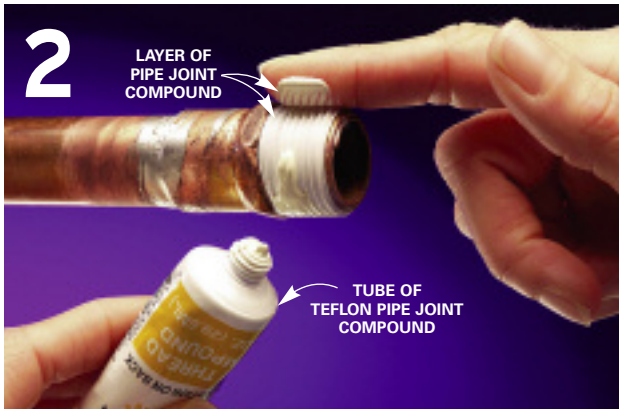


The skinny copper or chrome supply tubes used to connect faucets and toilets (Photo 1) are tricky to cut, bend and align. But you don't have to put up with them. When you're replacing a faucet or toilet, use flexible supply hoses with a braided covering instead ($3 to $6 each; Photo 2). They have rubber gaskets at each end and don't require much force to seal. They're available in many lengths and are flexible enough to fit almost any configuration. The only trick is buying a connector with the correct size nuts on the ends. Take your old tubing and the nuts on each end along with you to the store to be sure of an exact match.



Start the nuts carefully and hand-tighten. Then tighten an additional half turn (Photo 2). Avoid overtightening. It's easy to tighten the nuts a little more if the joint leaks.





Use two types of Teflon on threaded joints

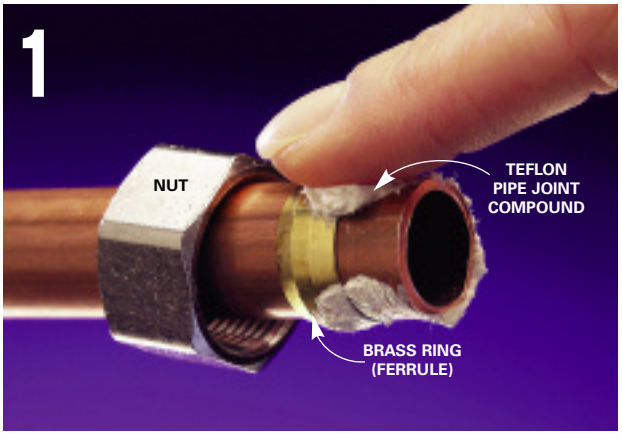
Connections that rely on threaded pipes and fittings are prone to leaks if they're not sealed with either Teflon tape or Teflon pipe joint compound. Careful plumbers use both on every joint for extra security. Plumbers don't want to come back!

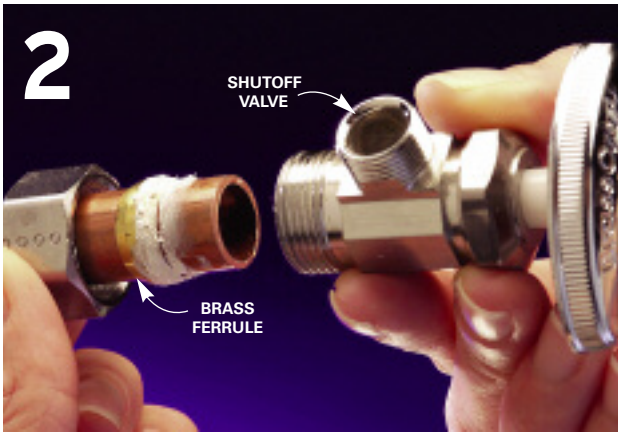
Start by wrapping the male threads with Teflon tape (Photo 1). With the end of the threaded pipe facing you as shown, wrap the tape clockwise. Usually three layers is enough. Once in a while, you'll run into a loose fitting that requires four or five wraps. Stretch and tear the tape to complete the wrap.

Spread a thin layer of Teflon pipe joint compound over the tape (Photo 2). If you're working with plastic pipe, choose Teflon pipe joint compound that's compatible with it. Then start the threads by hand before tightening the connection with wrenches (Photo 3). Wipe away the excess.

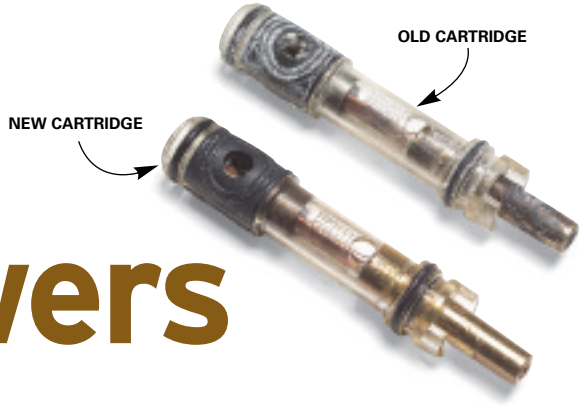
Lubricate the ferrule on compression joints

Compression joints are most common on shutoff valves, although you find them on other fittings as well. They have a brass or plastic ring (ferrule) that's compressed into a recess when you tighten the nut, forming a seal. Lubricating the pipe and the ferrule with a bit of Teflon pipe joint compound (Photo 1) helps the ferrule slide along the pipe and squeeze tightly into the recessed fitting with less wrench pressure (Photo 2). Tighten compression fittings firmly with two wrenches to crimp the ferrule onto the pipe (Photo 3). Also make sure the pipe or tube goes straight into the fitting. Misalignment will cause a leak. If the fitting leaks after you turn on the water, try tightening the nut an additional one-quarter turn. This usually stops the leak.





Repair drippy showers

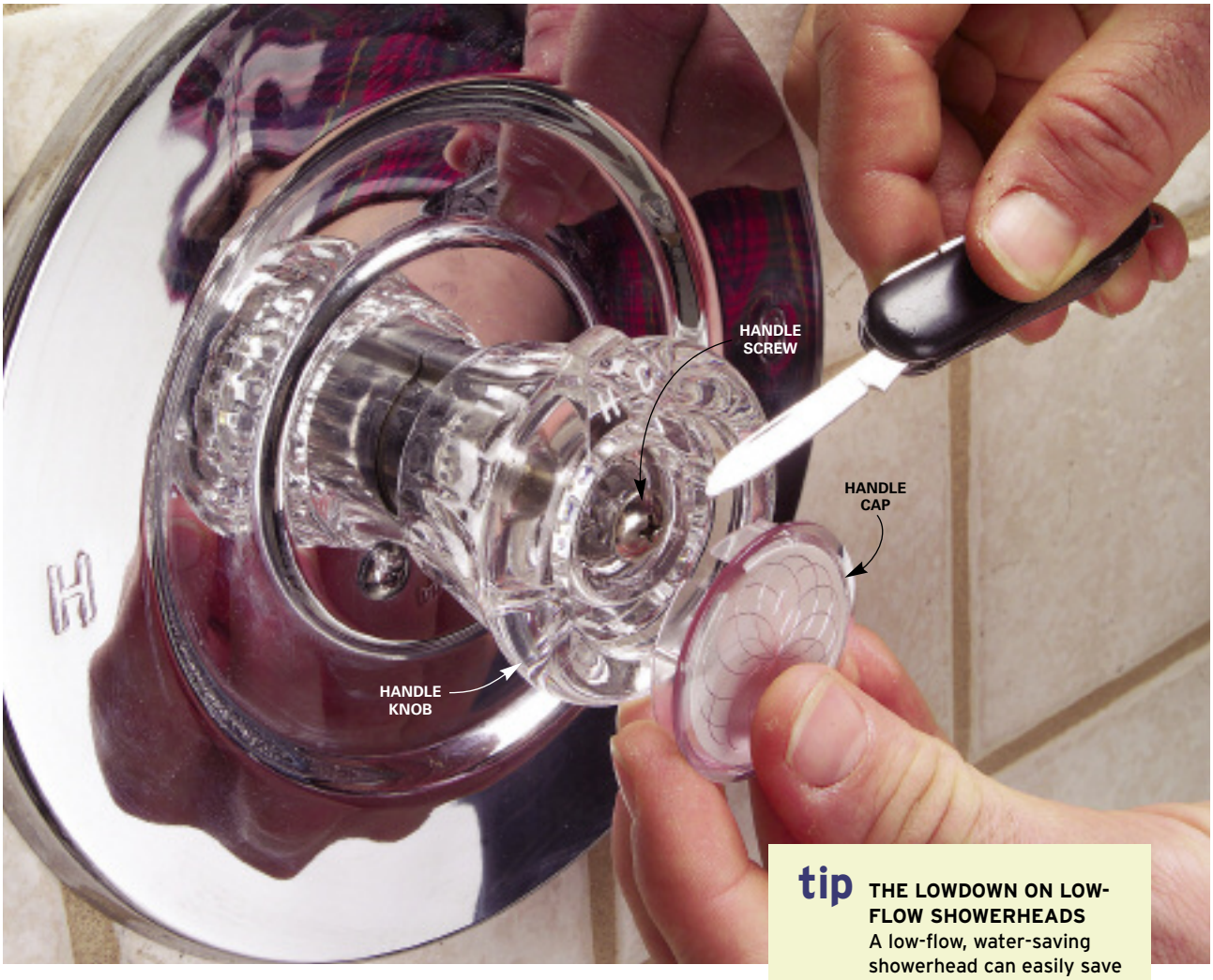


When your single-handle shower faucet drips and drips, refusing to completely turn off, don't assume you have to replace the whole faucet. Most faucets can be repaired in an hour for less than $50.

Shown here are the fixes for a cartridge-style faucet. Cartridge valves have a single handle and operate when the cartridge slides in and out. Don't confuse them with single-handle ball-style faucets, which have a dome-shaped casing under the handle.

Turn off the water at the fixture shutoff valves or at your home's main valve. Turn on a faucet to make sure the water is off. Remove the handle as shown in Photos 1 and 2. If the handle sticks, try heating it with a hair dryer set on "hot." If you still can't get it off, use a special handle puller ($10 to $20 from a plumbing parts distributor or home center).

Virtually every faucet manufacturer has a different method of securing the cartridge to the faucet body. Look for a clip or spring



1 **Turn off the water supply to the shower. Then pry off the handle cap with a small pocketknife to expose the internal handle screw.**

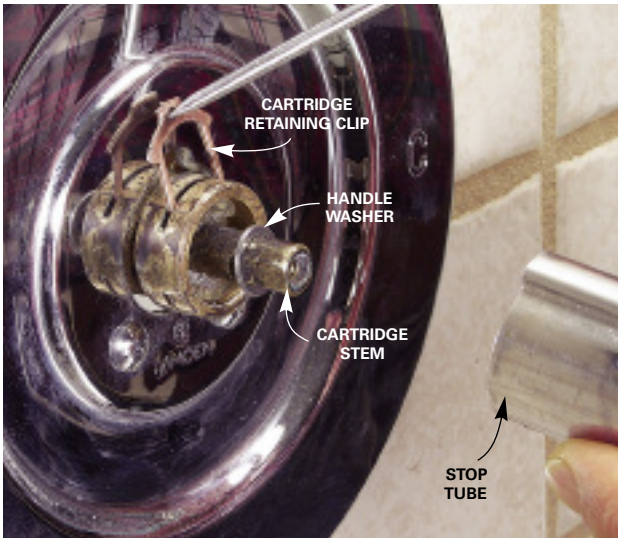
tip **THE LOWDOWN ON LOW-FLOW SHOWERHEADS**
A low-flow, water-saving showerhead can easily save up to $10 a year in water and water heating costs.

and remove it (Photo 3). Cartridges are often difficult to pull out. Some manufacturers include a removal cap with new cartridges. Align the cap with the old cartridge ears and try to twist the cartridge loose. Then pull it out with pliers.

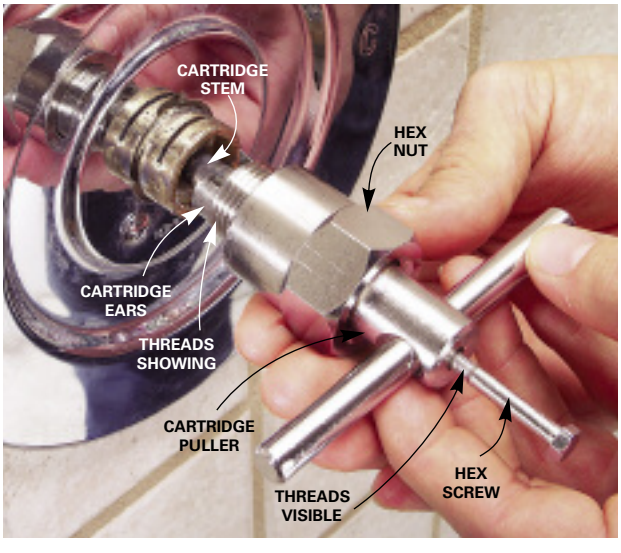
If you can't budge the old cartridge, you'll need a cartridge puller ($20 to $30 from a plumbing parts distributor). Make sure the one you buy works on your brand of faucet. Look on the handle or trim for the faucet brand or manufacturer. A knowledgeable person at a plumbing parts store may be able to identify the brand and model from a photo. Review Photos 4 and 5 for instructions on using a cartridge puller. Make sure you twist the cartridge loose before pulling it out (Photo 4). Take the old cartridge with you to a plumbing parts store or a home center to find an exact replacement ($15 to $25).

Lubricate the cartridge sides, O-rings, retaining clip, cartridge stem and handle screw threads with plumber's grease. Slide the new cartridge into the faucet body. Some cartridges can only be installed one way (to avoid reversing the hot and cold), so follow the enclosed instructions. Reassemble the remaining faucet components.

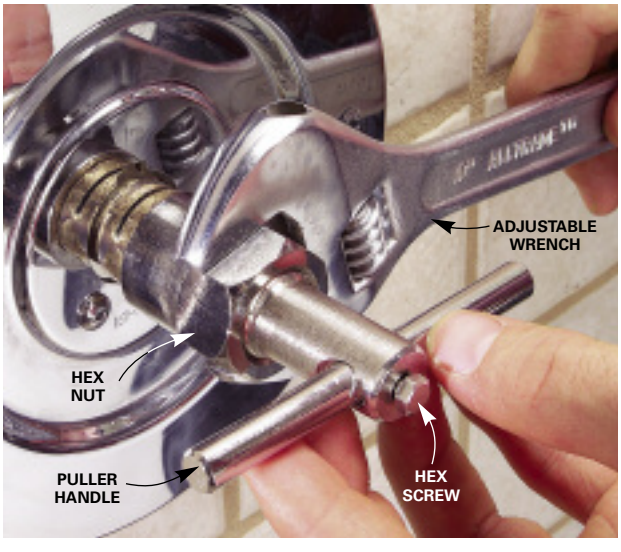
2 Loosen and remove the handle screw. Pull off the handle and set it aside.



3 Pull off the stop tube. Pry up the cartridge retaining clip with a small screwdriver or awl. Remove the handle washer and then twist the cartridge stem loose and pull it out with pliers.



4 If it's stuck, use a special cartridge puller. Unscrew the hex screw and hex nut until threads are visible. Slide the puller over the cartridge stem, aligning the tool ears with the cartridge notches, and twist to loosen.



5 Turn the hex screw by hand until it bottoms out. Snug up the hex nut by hand and tug on the cartridge puller handle. If the cartridge won't pull out, hold the puller handle steady and tighten the hex nut two full turns. Pull the cartridge out of the faucet body. Buy an identical replacement cartridge, align it properly and reassemble the parts.

Repair a washer-type faucet

A leaky faucet has a torturous way of wearing on nerves and water resources. Even a slow drip can waste hundreds of gallons per month. Luckily, most dripping washer-type faucets can be fixed in 30 minutes for less than a dollar.

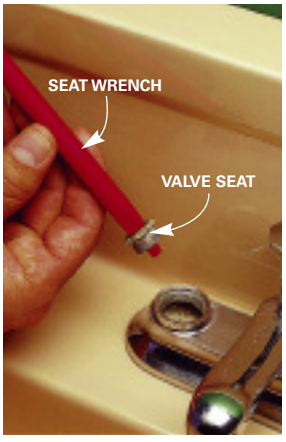
To repair a washer-type faucet, you'll need to replace the washer on the bottom of the valve stem and sometimes replace the valve seat as well. Replace washers for both the hot and cold water, not just the one that's leaking. Before you begin, turn off the water-supply valves and close the sink stopper so small parts won't disappear down the drain.

Most faucet handles are secured by a screw, which is sometimes covered by a snap-on cap or button. You may need to tap, wiggle or pry the handle a bit to remove it. The washer on the end of the valve stem may be flat or beveled. The new washer should be the same profile and fit snugly inside the circular lip without having to be forced.

With your finger, feel down inside the area where the stem assembly enters the faucet to determine whether the valve seat is rough or grooved. If it is, replace it with a new valve seat that exactly matches the old in diameter, height and threads.

1 Remove the screw holding the handle, then loosen and remove the packing nut. Remove the stem assembly.

2 Remove the worn washer and replace it with the correct type: flat or beveled. The new washer should fit snugly.



3 Use a seat wrench to remove the worn valve seat. The new seat must match the old one exactly.

4 Lubricate the working parts of the stem assembly with heat-proof faucet grease. Reassemble the faucet.

Repair an outdoor faucet

Most outdoor faucets, including the freeze-proof one shown, have a washer at the end of the long valve stem. Freeze-proof faucets are particularly prone to worn washers because, when the faucet is turned off, it continues to drain for a few seconds; consequently, people tend to turn the faucet tighter, damaging the rubber washer. Before beginning your repair, turn off the faucet's water supply.

1 Unscrew the handle and remove the packing nut. Hold the faucet steady while loosening the nut to avoid twisting the interior pipe.

2 Pull the stem out of the faucet. For removal, some stems have to be turned so a key lines up with a slot. Reattach the handle to turn and pull the stem.

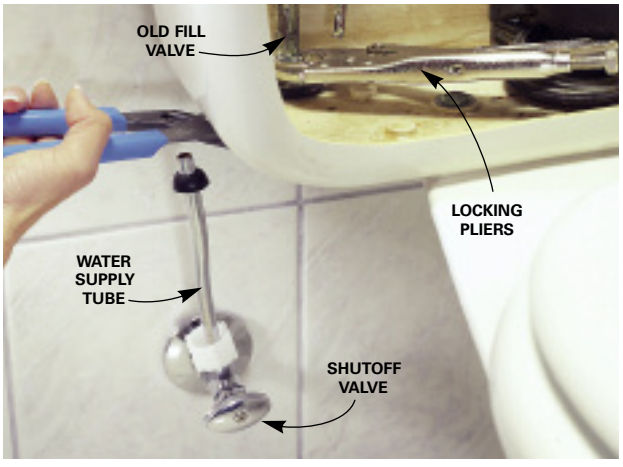
3 Remove and replace the rubber washer on the stem end. If there are rubber O-rings on the stem, replace these as well.

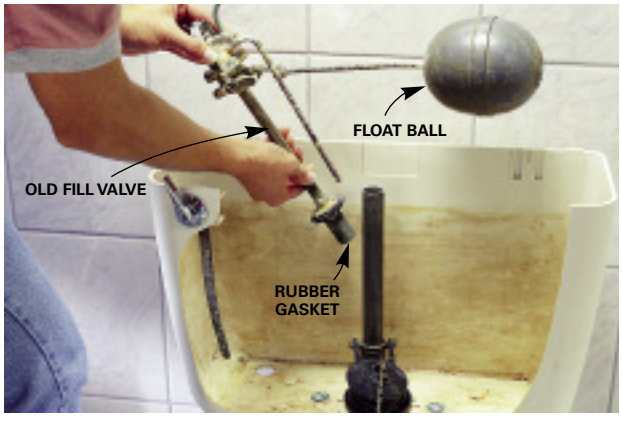
Overhaul a toilet tank

It's often easier to replace the entire working mechanism inside the toilet tank rather than to replace it piecemeal. A universal replacement kit and a few tools will silence the annoying watery sounds keeping you awake at night. First, shut off the water supply at the shutoff underneath the toilet or at the home's main shutoff. Be prepared to replace the toilet shutoff—corrosion or lack of use frequently causes it to seize or not close completely.

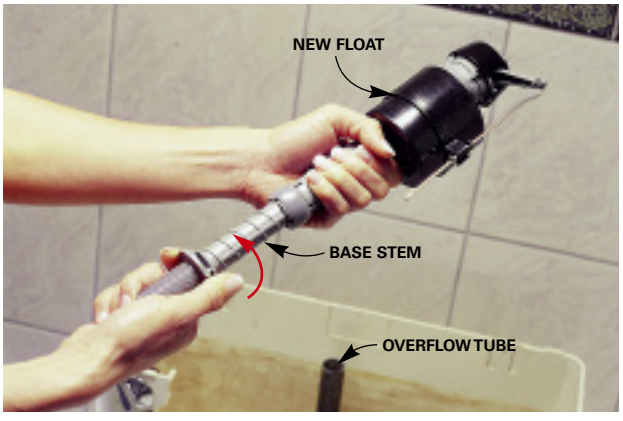
With the water off, flush the toilet to drain the tank. Sponge up the remaining water in the tank. Be sure the tank is completely empty before you remove any parts.

1 Disconnect the water supply tube located under the tank's bottom left side. Inside the tank, attach locking pliers to the base of the old fill valve to keep it from spinning. With adjustable pliers, remove the locknut on the outside of the tank.

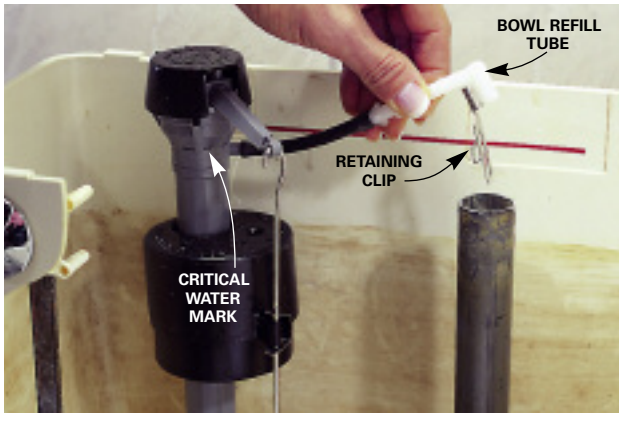




2 Remove the old fill valve after unscrewing the locknut under the tank, then lift out the mechanism. The float ball and refill tube are attached and will come out with it. Clean the area around the hole where the fill valve mounts to the tank.



3 Adjust the length of the new fill valve by twisting the fill valve base stem until the critical water mark (see Photo 4) is 1 in. above the top of the overflow tube. Install the rubber gasket and test-fit the height by setting the valve in place. Orient the fill valve so the bowl refill tube points toward the overflow tube. Secure the fill valve with the locknut.



4 Trim the bowl refill tube to length to avoid kinking and install it. Push the refill tube over the stem on the valve and clip it to the rim of the overflow tube so water will be directed straight into overflow. Install and tighten the water supply tube and turn on the water to test the toilet.

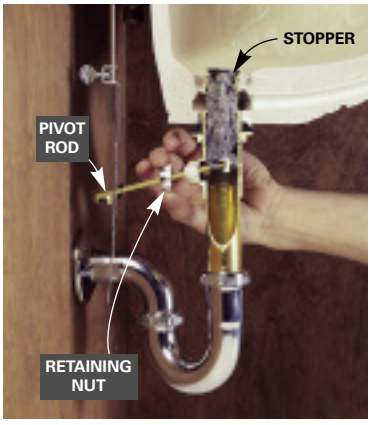
5 Clean out the new valve to remove any dislodged mineral deposits. To do this, turn off water, take off cap, and then open water shutoff valve slowly to let water bubble out.

Unclog a sink drain

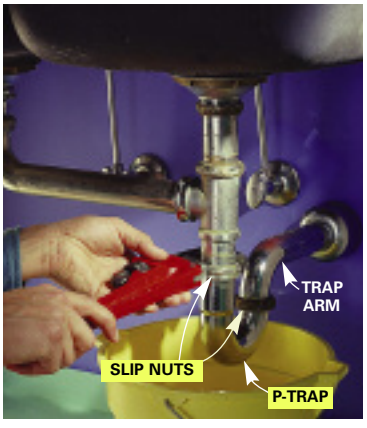
Clogged or slow-draining sinks and tubs are more than a nuisance; they can put your entire bathroom or kitchen out of action and disrupt your family's busy schedule. But as frustrating as they make life, most drain clogs can be quickly cleared, even by a novice, in 10 to 15 minutes.

The first step to clear a clog is locating it. This task often takes some trial and error, but here are some clues. If only one fixture is clogged, the problem is either in the stopper mechanism, the P-trap or the drain leading away from the fixture. If a group of fixtures is affected, look for the clog downstream from where their drains join.

1 **Plunge the sink drain. Fill the sink with 2 in. of water. Completely cover the drain hole with the plunger bell. Cover the overflow hole with a wet sponge to maintain pressure. Make the first plunge slowly to expel air from the bell; then plunge in and out vigorously 15 to 20 times. Add water as needed to keep the bell covered and air out.**



2 **Clear stoppers of hair and debris. For sinks with stoppers locked in place by a pivot rod, first remove all standing water from the sink. Unscrew the retaining nut on the back of the sink drain and remove the pivot rod from the stopper. Remove the stopper and clear away clog. Reinstall the stopper assembly and test the drain for leaks.**



3 **Clear the P-trap. Place a bucket under the trap, loosen the slip nuts using a pipe wrench, if necessary, remove the trap and clear the debris. Reassemble the trap.**

4 **Snake the drain. Remove the trap arm, slide the spiral end of the snake into the drain and feed it all the way to the clog. Lock the snake's offset handle in place and crank the snake clockwise while pushing it forward. Slide the handle back and relock as necessary. The spiral end helps work the snake around the bends and break up clogs.**

Unclog a bathtub drain

In bathrooms, by far the most common source of clogs is a wad of hair and soap scum wrapped around the stopper mechanism or, in a shower, lying just underneath the drain cover. Always check for this problem before resorting to taking drains apart for snaking.

1 **Unscrew the overflow plate and remove it and the stopper mechanism. Some tub stoppers have two main parts—a spring or weight in the vertical overflow drain and an arm attached to the stopper plug in the horizontal tub drain. Clean the stopper parts, cover the overflow hole and plunge the drain. Reassemble the stopper.**

2 **If the clog remains, run the snake down the overflow hole to clear obstructions. If still unsuccessful, replace the overflow plate and stopper mechanism, and remove the P-trap through access hole or from below. Then run the snake down the drain as you would a sink drain.**

Replace a tub spout

Bathtub spouts can go bad in three ways: First, the diverter can wear out so it no longer blocks the water flow and sends water to the shower head. Second, the threads inside the spout can crack or corrode where the spout screws onto the pipe. Water can then trickle along the pipe and drip inside the wall. Finally, the spout's finish can flake off or corrode.

Replacement is the solution to any of these problems. A new spout ($10 to $20) and everything else you might need are available at hardware stores and home centers. But before you buy a new spout, determine what type you need. First look under the spout. If you see a setscrew (Photo A), you have a "slip-on" spout. The setscrew might be smaller and harder to see than the one shown here; you may need a flashlight to spot it. Replacing a slip-on spout is easy: Just loosen the setscrew (usually with a hex wrench) and pull the spout off the copper pipe that protrudes from the wall. Twist the spout as you pull and be gentle so you don't loosen any pipe connections inside the wall. Then slide on the new spout and tighten the setscrew.

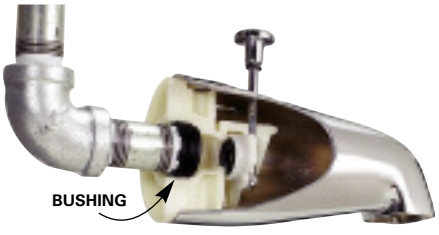
tip Plumbers say that leg-shaving is the leading cause of tub spout trouble. The spout makes a convenient footrest for shaving, but that can damage the diverter or loosen pipe connections.

If the spout doesn't have a setscrew, it's a screw-on spout (Photos B and C). Twist the old spout counterclockwise to remove it. If the pipe that protrudes from the wall is copper with a threaded fitting (Photo B), simply cut off the fitting with a tubing cutter ($10) and install a new slip-on spout (Photo A). If the pipe coming out of the wall is steel (Photo C), you need a new screw-on spout. Ideally, the new spout will fit perfectly onto the old pipe. But there's a good chance that the pipe protrudes too far or not far enough. There's also a chance that the threads are too corroded for you to screw on a new spout. Either way, you'll have to remove the old pipe (Photo 1) and screw in a new pipe of the correct length (Photo 2). Short sections of threaded pipe (called "nipples") are usually available in 1-in. increments. They cost less than $2 each, so buy a couple of different lengths and save yourself a trip back to the store.

Spout types

A Slip-on spouts slide over 1/2-in. copper pipe and fasten with a setscrew. This "universal" version also has threads inside, so it can screw onto threaded pipe.

B Screw-on spouts have threads deep inside. They can connect to a copper threaded fitting or to steel pipe.



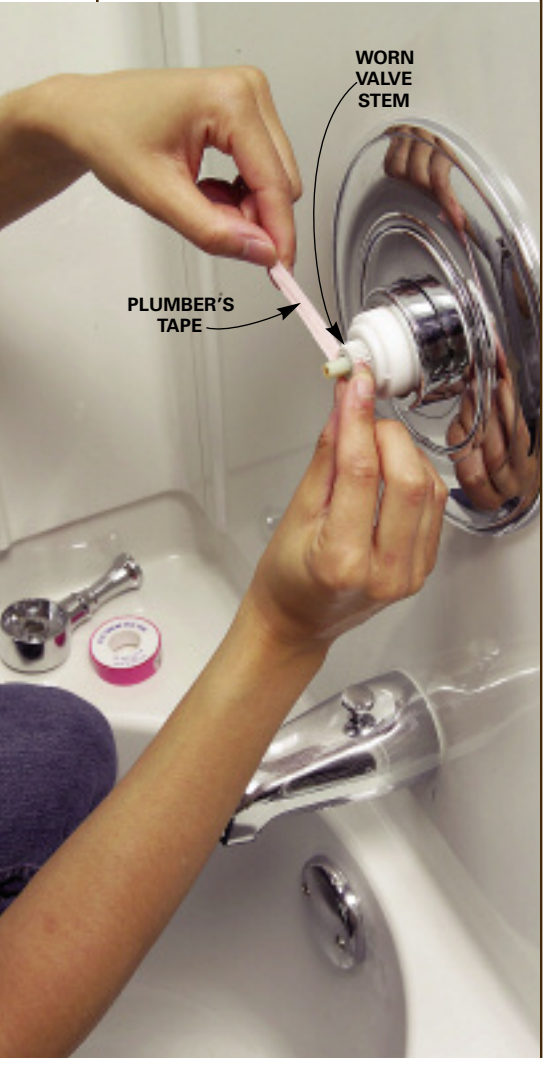
C Screw-on spouts may have threads at the back end. Most come with a bushing so they fit either 1/2-in. or 3/4-in. pipe.

1 Unscrew the old nipple with a pipe wrench. If the nipple is too short to grab with a wrench, use an "internal" pipe wrench ($10).

2 Wrap both ends of the new nipple with thread tape and screw it into the fitting inside the wall. Seal around it with silicone caulk and screw on the new spout.

Tighten a floppy faucet handle

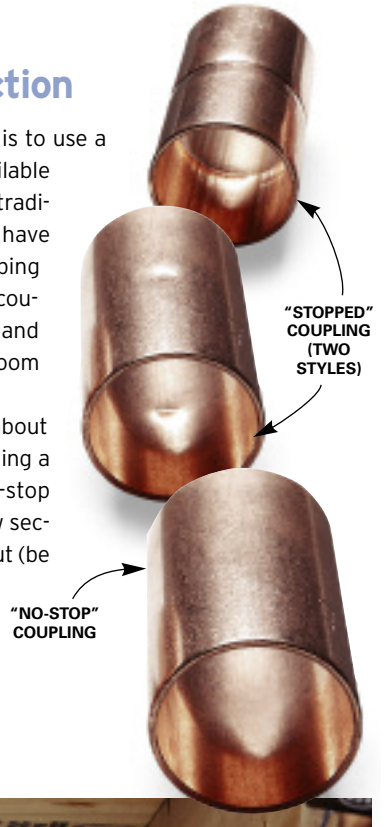
If you have a loose valve handle—on a shower, bathroom or kitchen faucet—tighten the screw that holds the handle in place. With some faucets, you'll have to pry off the metal button at the center of the handle. With others, you'll find a setscrew near the base of the handle. Setscrews usually require a hex (or "Allen") wrench. If tightening doesn't work, the stem inside the handle may be worn, especially if it's plastic. Here's a trick to tighten worn stems on most types of faucets: Wrap the stem tightly with Teflon pipe thread plumber's tape and slip the handle back over the stem. In most cases, a single wrap creates a snug fit.

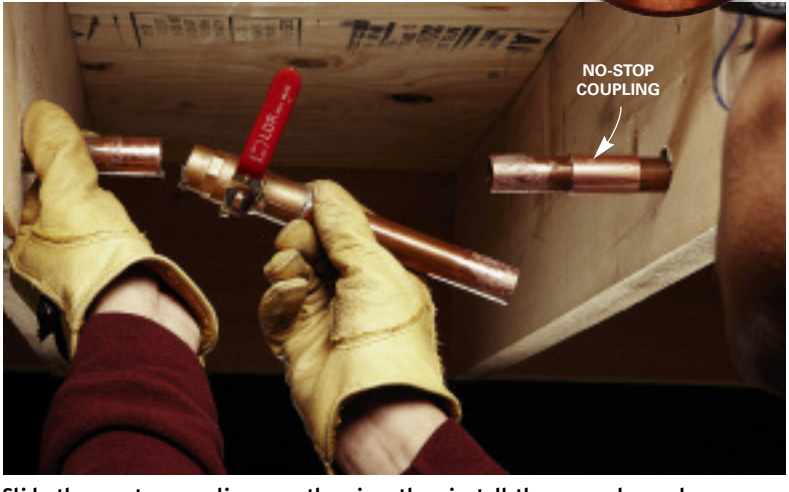


Replace a water pipe section

The key to replacing a leaky water valve is to use a special "slip" or "no-stop" coupling (available at home centers for less than $3). Unlike traditional couplings, no-stop couplings don't have a flange or dimple that stops the plumbing pipe once it's inserted halfway into the coupling. This lets you install the coupling and move it back out of the way, then have room to insert the new section of pipe.

Turn off the water, then cut the pipe about 6 in. from each side of the leaky valve, using a pipe cutter or a hacksaw. Place the no-stop coupling over the existing pipe. Cut a new section of pipe to replace the piece you cut out (be sure to factor in the length of the water valve). Solder the pipe to the valve, then stick the assembled section between the two existing pipes. Move the no-stop coupling over the new pipe, then solder all the joints.





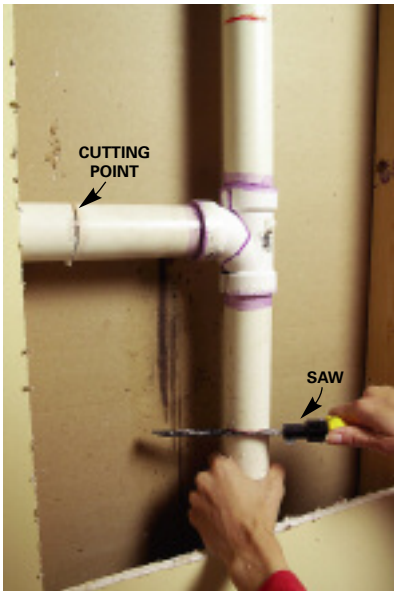
Slide the no-stop coupling over the pipe, then install the new valve and pipe assembly.

Move the no-stop coupling over the pipe assembly, then solder it to the assembly and the existing pipe.

A trick for splicing in plastic drainpipe

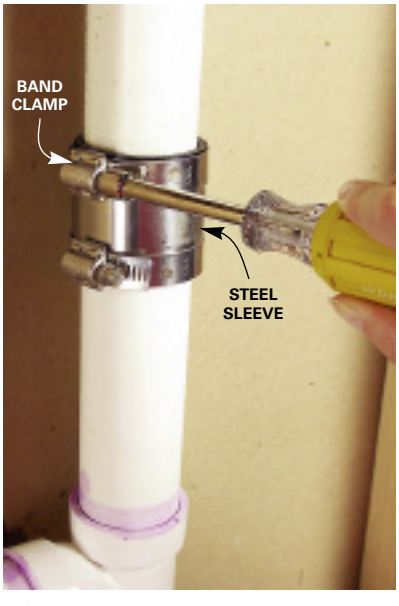
When fixing a leak in a drainpipe at a junction with other lines, don't try to cement (solvent-weld) all the new couplings. Most drain systems use rigid pipes fairly large in diameter. You can't flex them enough to slide on that last fitting and get it to seat fully. Rather than struggle with cement, pros use a "mission" coupling (Photos 3 and 4) that clamps over the last joint. Even though a mission coupling costs $5 to $10, compared with a 50¢ plastic coupling, the extra cost is worth it. Sometimes, pros will even use two mission couplings in tight situations. Photos 1 – 4 walk you through the process. Be sure to buy couplings with full steel sleeves, and make sure mission couplings meet code requirements in your area.

1 Buy and assemble matching replacement parts. Mark the cutting points on the old drains about 1/2 in. longer than the replacement.

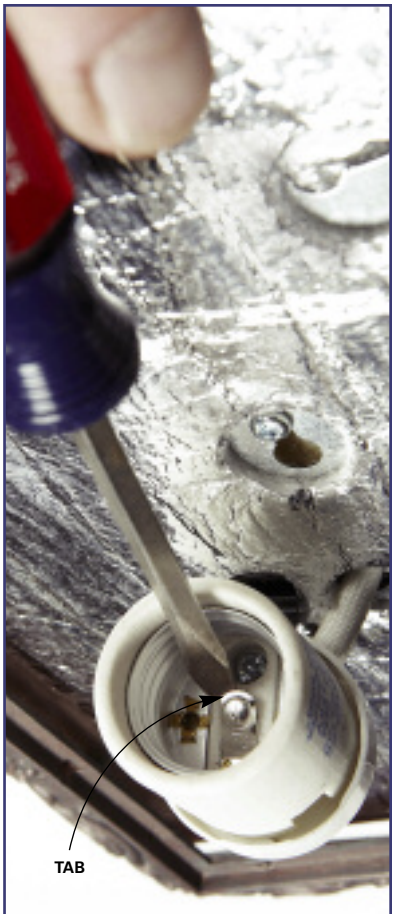


2 Cut the plastic at a right angle using a fine-tooth saw and remove the assembly.

3 Slide the mission coupling onto one pipe and cement plastic couplings onto the other two pipes.



4 Center the mission coupling over the third joint and tighten the bands firmly.



Simple solution for a troublesome light fixture

Do you have bulbs that burn out quickly, lights that flicker, or a light fixture that simply doesn't work even though there's power to it? Try this 60-second fix before you call an electrician.

Turn off the power to the fixture and use a noncontact voltage tester to make sure the power is off. Then reach into the bulb socket with a flat-blade screwdriver and gently pry up on the tab that's centered at the bottom to restore good contact with the bulb.

Pros' favorite shop tools

Cut dust, save time

"The best addition to my woodworking shop over the past 10 years was a basic, low-cost dust collection system," said Gary Wentz, senior editor for *The Family Handyman*. "My goal was cleaner air, but I soon found that a dust collector has an even greater benefit: It's a time-saving tool. It drastically cuts cleanup time—I don't have to sweep off every surface and tool. I used to do the dustiest work, like sanding or cutting MDF, outdoors. Now I do these jobs in the shop—no need to drag tools and cords outside."

A dust collector is basically a big vacuum, but it sucks in a lot more air (and dust!) than the most powerful shop vacuums.

"Complete with hoses and fittings, my small-scale dust collection system cost less than $300," Wentz said.

Some home centers carry dust collectors, but the best place to browse is online. Just search for 'dust collector.'

Fast screw guns

"What I like about the automatic-feed screw guns is their speed. You don't have to handle individual screws—the screws come in strips that you feed into the gun," said Jon Jensen, set builder for *The Family Handyman* and former contractor. "They're wonderful tools for drywalling, fastening decking—any job where you need to drive a lot of screws. You can adjust the depth for sinking screws and for different types of screws. That's what makes it really versatile."

The DuraSpin 14.4-volt model by Senco ($150; senco.com) and the Autofeed Screwdriver by Makita ($110; makita.com) are two automatic-feed screw guns. And the cordless option is another big benefit.

"You just keep the tool running, and it drives each screw to the exact same depth each time," Jensen said. "You can really get a lot of work done fast."

Fast and easy joinery

"A Kreg Jig will let you make a joint in about two minutes. I first saw the jig during a product demonstration at a tool show years ago," said Jeff Gorton, associate editor for *The Family Handyman*. "I was impressed enough that I went out and bought one. It's become one of my favorite tools because it lets me build furniture, cabinets and bookcases without having to cut fancy (and time-consuming) joinery."

Jeff Gorton

A Kreg Jig lets you drill pocket holes, then screw the pieces together with special screws. You'll leave visible holes, which you can hide inside the project or fill with special pocket-hole plugs.

Kreg sells several different pocket screw kits. At a minimum you'll need a two-hole drill guide similar to the one shown above, a step drill with a stop collar, a long driver bit for the pocket-hole screws, and a face clamp. These will cost you about $75. To see the full range of Kreg products, or to find a dealer, go to kregtools.com.

Easy-to-handle air hoses

Travis Larson

"I've gone through many, many air hoses over the years—rubber, plastic, synthetic, you name it," said Travis Larson, senior editor for *The Family Handyman*. "They all get hard and inflexible in cold weather, they're hard to coil, black ones leave marks all over walls when you're trimming, and they're very heavy. The four or five survivors are all hanging neatly in my shop, unused for the three years since I converted to polyurethane lines."

Polyurethane is soft, so it's more flexible than rubber. The air hoses are lightweight, flexible and easy to coil up at the end of the day, even in low temps. They don't leave scuff marks, so you can use them inside without marking up the walls. And the hoses are tough enough to withstand use and abuse on job sites.

"I love the way the hose's slippery surface glides over everything. You don't have to constantly pull on them to drag them, and they don't get hung up like the old-fashioned hoses did," Larson said. "They're well worth the premium price tag."

A 50-ft. polyurethane hose costs $30, versus about $10 for a traditional hose. Polyurethane hoses are available at some home centers or online (amazon.com is one source).

Dual-use wire stripper

Ken Collier

"I used to use two tools for wiring projects—a goofy little stamped metal tool to strip off sheathing and a pair of wire strippers to strip insulation off individual wires," said Ken Collier, editor in chief for *The Family Handyman*. "Those days are gone. My new wire strippers do both tasks admirably.

"I've rewired my cabin, my workshop and most of my 100-plus-year-old house. Wire strippers that strip the sheathing and the insulation make wiring faster, easier and more pleasant."

These strippers start at $15 at home centers.

Special section: Use tools like a pro

Lights that last (almost) forever

LED (light-emitting diode) flashlights and work lights are fabulous because the bulbs seem to last forever and so do the batteries—making cordless trouble lights feasible (finally!). LEDs are great on a variety of levels. Unlike traditional flashlights or work lights, LEDs have unbreakable bulbs that last 50,000 hours or more. They cast a clear white light that's easier on the eyes than the yellow-white light of standard bulbs.

LEDs consume only one-tenth the battery power of regular flashlights and work lights. Sure, LED flashlights and work lights cost a bit more on the front end, but you won't have to replace the batteries or bulbs for years. They're worth checking out!

— Elisa Bernick, associate editor for *The Family Handyman*


Elisa Bernick


Eric Smith

Smooth rollers, smooth finishes

Before a painter friend turned me on to foam rollers, I had a hard time getting a smooth finish on doors and woodwork.

These mini rollers, only 4 or 6 in. long, are made of dense foam that spreads the paint or varnish smoothly for a uniform, mark-free finish (unlike nap rollers, which leave tiny bumps). I was amazed the first time I used one.

But the rollers aren't perfect. They spread the finish thin, so you usually need two coats. And the rollers are a pain to clean, but since most cost less than $5 at home centers and paint stores, you could toss them when you're done.

— Eric Smith, associate editor for *The Family Handyman*

Three tools in one

The Japanese cat's paw has three intended uses: It pulls nails, works as a pry bar (the thin blade will get under just about anything) and acts like a small hammer to whack things. Once you own one, you'll find other uses for it too.

"It has a permanent place in my tool belt," said Ken Collier, editor in chief for *The Family Handyman*. "I use it for prying open cans, as a rough-and-ready scraper, and for pulling small nails that would slide out of the hammer claw. It's an always-with-me tool."


Ken Collier

Japanese cat's paws and other small cat's bars start at $10 at home centers.

Brett Martin

Air compressor that fits on your belt

When Kobalt hit the market with its portable compressed CO2 regulator kit last year, my first thought was, "What took so long?" It's a great idea that seems long overdue. The cylinder powers pneumatic brad nailers and staplers with up to 120 psi, so you don't have to drag around a bulky (and loud!) air compressor and hoses for small jobs.

The cylinder fits on your tool belt and has a 10-ft. hose. I hooked mine up to a nail gun and installed the baseboards in my kitchen. The 20-oz. cylinder gives you up to 675 shots with a brad gun. It's great for projects in finished rooms when you don't want to run air hoses and worry about them scuffing the floor or walls. Lowe's sells the regulator kit for $85 (buy it online at lowes.com). New cylinders cost $6 for 9 oz. and $9 for 20 oz. when you trade in your old tank.

— Brett Martin, associate editor for *The Family Handyman*

Photo courtesy of Kobalt

Mighty midget batteries

Gary Wentz

I've tossed a dozen perfectly good cordless drills because the batteries died and new ones cost as much as a new drill. That's one reason I love new lithium-ion batteries: They have a longer life span—twice as long, according to some manufacturers.

But the best thing about lithium-ion batteries is that they're about half the size and weight of other batteries. That means power-guzzling tools like saws can pack more punch and run longer without being too heavy. And the screwdrivers are small enough to drop in your tool pouch, but powerful enough for just about any job.

— Gary Wentz, senior editor for *The Family Handyman*

Shop tips from a pro

Custom furniture maker Bruce Kieffer spent two years planning and building his dream shop and its array of power tools, the dust collection system and a spacious work area.

And when it comes to woodworking, nobody is neater or more orderly and efficient than Bruce. Try these tips out in your shop and transform your woodworking into a far more civilized and fun activity.

The apron

Bruce wears an apron while woodworking. He's convinced of its utility (Cross-Back Shop Apron, $22 at rockler.com). Calipers, tape measure, squares, dust collector remote switch, wood shields for glue clamps—they're right at your fingertips. And a small screw gun is another invaluable tool. "As you can see from this yellow crust on the front, my apron doubles as a rag for gluey fingers," Bruce said. "I can't imagine doing woodworking without it."

Poly squirter

Want to know how to avoid drips and messes when you apply polyurethane varnish to large surfaces or multiple pieces of trim? Bruce grabs his "High-Tech Glue Bottle Poly Applicator" (an ordinary squeeze bottle) and squirts narrow beads of finish onto the boards, then rolls them out. The poly flows neatly onto the wood and rarely drips onto the floor. "After practicing a few beads, you can squirt out just the right amount for each board."

Stay-flat plywood spacers

Little belted-together blocks are stuck between pieces of plywood alongside Bruce's lumber rack.

"Plywood or other sheet stock can warp, especially if it's stored surface to surface. The blocks separate the sheets so air can circulate on both sides. Flat sheets from the lumberyard stay flat this way, no matter how long they're stored," Bruce said. The leather is flexible, so you can use them on any combination of thicknesses of sheet goods.

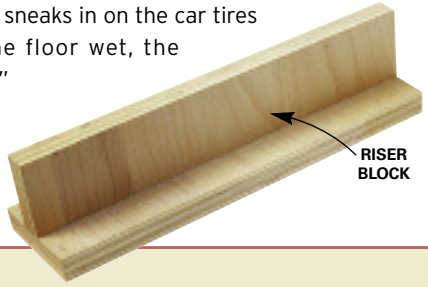
The blocks are a snap to make from scrap wood and leather. Cut two 1-in.-wide strips of leather (or vinyl or heavy cloth) and space and screw 2-in. x 3/4-in. x 1-in. blocks along the strap. "The air space also keeps them a lot easier to grab when you need to pull one out. For full sheets, use three sets of spacers, one at each end and one in the middle."

Stay-put driver bits

The only seemingly random—but in fact truly ingenious—setup in Bruce's shop is this: a few magnets stuck to shelf standards inside cabinets with assorted driver bits attached. "They're right there when I need them, and those babies stay *magnetized!*"

High-and-dry plywood

Bruce has some riser blocks supporting a few sheets of plywood. "I just cut some 2-in.-wide plywood scraps and screwed them together to form T-blocks and store the plywood over them. If snow, slush or rain sneaks in on the car tires and gets the floor wet, the wood is safe."



Find-anything hardware drawer

Nothing has a chance to randomly accumulate in Bruce's shop—not in apron pockets, on cabinet shelves, not even in a drawer. There is truly a place for everything, everything goes in its place, and no usable area remains empty. One of his hardware drawers is a sublime example.

In this drawer, movable partitions are held in place by strips of foam weather stripping at the front and back. The 44-plus boxes rest on edge, labels up, for easy grabbing and stowing. "I key the labels in on the computer and print them out on sticky labels." Think of never having to wonder where to find a 1-in. drywall screw or a 3/8-in. washer!

Shop for boxes at craft, tackle, office or dollar stores. But if you want lots of just about any particular size box, check out althor.com. This is for super-organized shop people, though. The minimum order is $100! But you get tons of high-quality boxes for the money.