HOMEOWNER REPAIR GUIDE

BATHROOM EXHAUST FANS

For do-it-yourself repairs

If your house is like most, you're waging a constant battle against mildew, condensation, peeling paint and wallpaper, and other problems caused by excess moisture in your bathroom. The most effective remedy is to install an exhaust fan that will draw the water vapor produced by your shower to the outside. The vapor will be exhausted through a pipe made of rigid or flexible metal or plastic to an exhaust vent mounted on the roof or, occasionally, on an exterior wall.

> **VENT TO THE OUTSIDE ONLY**
>
> Never exhaust water vapor into an attic or crawl space, as major structural damage and/or health issues can result.

If you don't already have a fan in place, you will need to purchase an exhaust duct kit, in addition to the new fan.

CHOOSING A FAN

The first step is to determine the kind of fan that will meet your requirements. It's important that the fan be strong enough to exhaust all the water vapor in the size bathroom you have.

> **HOW POWERFUL A FAN DO YOU NEED?**
>
> According to the Home Ventilating Institute, you can compute how powerful a fan you'll need by calculating the cubic area of your bathroom (length x width x height), divide by 60 (the number of minutes in an hour) and multiply by 8 (the number of recommended air changes in an hour).
>
> **cfm = (length × width × height) ÷ 60 × 8**

For an average-size bathroom, the minimum requirement is 80 cfm, but if you have one of the larger bathrooms sometimes found in older houses, you'll need a more powerful model. Remember, though, that it doesn't hurt to get a stronger fan than the minimum required; a better quality fan will generally move more air than a model of lesser quality.

You should also consider how noisy the fan will be when it is running. Better quality fans will emit 2 to 3 "sones" (a measure of sound level), while less quiet models may emit more than five sones. Check the packaging of the fan you are considering to identify its noise level.

MOUNTING THE FAN

The exhaust fan is generally surrounded by a metal housing. You should install it in a central spot, near the shower area, at the high point of the ceiling. Unless you are replacing an existing fan, you'll need to cut a hole in the bathroom ceiling to mount the fan body. Try to install the fixture where you can fasten it directly to a ceiling joist. If

this is not possible, attach a wooden brace between two joists as a support for the fan housing, or use the special hanger that comes in some kits.

Remove any insulation from the area where you will be mounting the fan, and, if you are replacing a light or an old exhaust fan, turn off electrical power to the circuit and disconnect the old fixture. Hold the fan housing against the ceiling and trace around it to define the hole to be cut; drill pilot holes at the corners and use a drywall saw or jigsaw to cut between them. The fan housing will cover any small imperfections in your cut, but too loose a fit will lessen the insulation value around the duct pipe. Secure the fan body in place.

WIRING

If you are replacing an existing light fixture with a light/fan combination fixture, you can just enlarge the hole in the ceiling to accommodate the fan body and then use the wiring already in place to operate the new fixture. The fan will operate whenever the light is turned on. If you wish to operate the fan independently of the light, you will need to run a 3-wire cable between the fixture and the junction box, and mount a double switch in the box. If your fan unit has a heater and/or timer, the wiring will be more sophisticated. In either case, follow the instructions from the manufacturer.

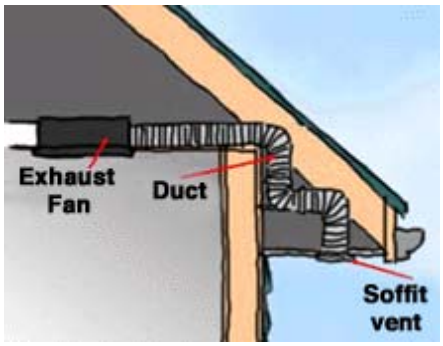
Depending upon the way the joists are positioned, and whether the room is on the first or second floor, you may need to cut into your ceiling and/or walls to get the wires where they need to go. The ***Rewiring an Old House*** handout from our Repair Library has tips on fishing wire through walls; our separate handout on wall switches may also be helpful.

> **LEAD PAINT DUST**
> And, be sure to consider how to protect your family from lead paint dust when old plaster is disturbed.

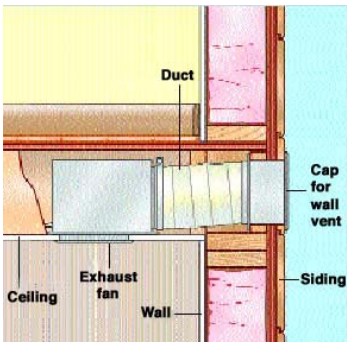
CONNECTING THE DUCT

In addition to securing the fixture in the ceiling and completing the wiring, you'll need to connect the exhaust duct to the fan housing. Secure it around the vent shroud on the fan body with at least one screw or, if you are using flexible plastic, with dryer vent clamps. Replace the insulation, following the manufacturer's instructions about how far away it must be kept from the fixture; fans that have lights or heaters may require you to add dams to keep the insulation away from the heat source. Then, install the grill cover on the fan unit in the bathroom ceiling.

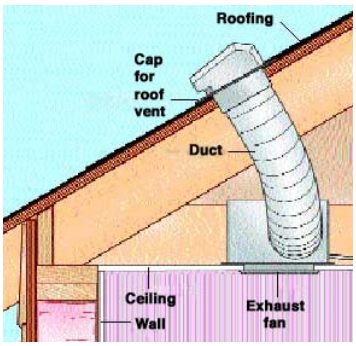
VENTING OPTIONS



Venting to a soffit



Venting through the roof



Venting through the wall

SOFFIT

It's easiest to run the exhaust duct to the nearest soffit; by venting it under the overhang of the roof, you can prevent rain, snow, or debris from getting into the vent pipe. Cut a hole in the soffit according to the directions in

your exhaust duct kit, and mount the vent in place. If you route as much of the duct as possible horizontally across the attic, you will reduce the chance that condensation might drip back down around the fan body. It can also help to cover the entire length of the duct with insulation wrap.

ROOF

If you can't run the duct to a soffit, the project will be a bit more complicated. You can install a vent through the roof, with a special cap that includes a damper.

WALL

Another option is to vent the water vapor through the wall. There are even fans designed to mount on the bathroom wall, instead of the ceiling, and vent directly to the outside through hinged dampers similar to those used for clothes dryers.

Home Repair Resource center

Home Repair Resource Center empowers homeowners to maintain their homes for sustainable and diverse communities.

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