HOMEOWNER REPAIR GUIDE

REPLACING A PULLCHAIN

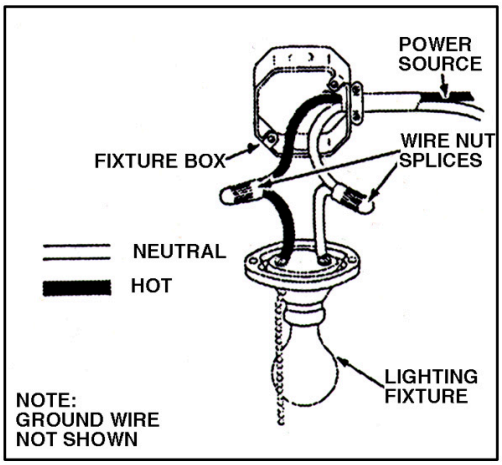
With a wall switch

You walk into the dark bedroom trying to feel for the pullchain that will turn on the ceiling light; in the dark, you stub your toe against the footboard of the bed. Descending into the dark basement, you can't locate the pullchain; instead, you take a little trip on Junior's skateboard. You can end all that by installing a wall switch at each entrance to the room, to replace the pullchain on the light fixture.

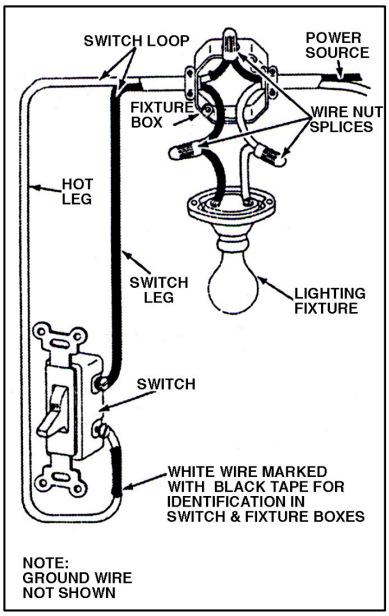
In new home construction, you'll see that even closets have wall switches for the overhead lighting. That was not the case for housing built in the dawn of the electric age. Bedrooms, bathrooms, basements and kitchens were often wired just to the ceiling fixture workbox (if there even was a box), to save labor and material costs. Almost immediately, this design became a health and safety issue. The **NEC** (National Electric Code) was eventually changed to require that wall switches be placed at the entryway of each room.

REQUIRED AT POINT OF SALE

In many communities, including Cleveland Heights, it is required that wall switches be installed in all traffic and living areas (unfinished attics and closets are exempted) before you can sell your home.



Before: fixture controlled by a pullchain



After: a switch loop runs from the fixture box to a wall switch

TEARING INTO WALLS

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. Read the ***Rewiring an Old House***

handout from our Repair Library for tips on fishing wire through walls. (If you are hiring a contractor to do this job, discuss whether wall repair will be done by the electrician, or if you will need to hire someone else for that part of the project.)

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

The wall switch should be positioned near the entrance door, about 48 inches from the floor. The switch must be contained in a metal or plastic box. (There are several types of boxes, which differ primarily in the way they are mounted in the wall. If possible, position your box next to a wall stud, so you can use one of the styles that is nailed or screwed to the stud. Depending on the type of wall material you have, you may find it helpful to use a box that adjusts in depth or one that has a "mud ring" on it to raise the switch to the level of the surrounding wall surface.)

NEW WIRING

> **POWER OFF FIRST**
>
> The first thing you must always do is to shut off the power from the fuse box to the fixture. *Test the wires with a circuit tester* to ensure that the electricity is off before starting to work on the circuit.

The black wire in the box holding the light brings power to the fixture. The purpose of the switch is to interrupt that power supply when you don't want the light on. To do that, you create a switch loop, which runs from the power supply down to the switch box and back up to the light fixture.

If you want to have multiple switches at different locations that control the same fixture (at the top and bottom of a stairway, for example, or at each entrance to a room with more than one door), the wiring will be more complex *(see separate handout on "Three-Way Switches")*.

While most older houses were wired with 14 gauge knob and tube, for the switch loop use 12 gauge NM (nonmetallic sheathed cable), commonly referred to as Romex™. The cable contains a black wire, a white wire and a bare wire. Ordinarily the black wire is "hot," the white wire is "neutral," and the bare wire is "ground." For this job, the white wire in the switch loop will also serve as a hot wire, so it should be "tagged" (marked with black tape) in the fixture and switch boxes *(see illustration)*.

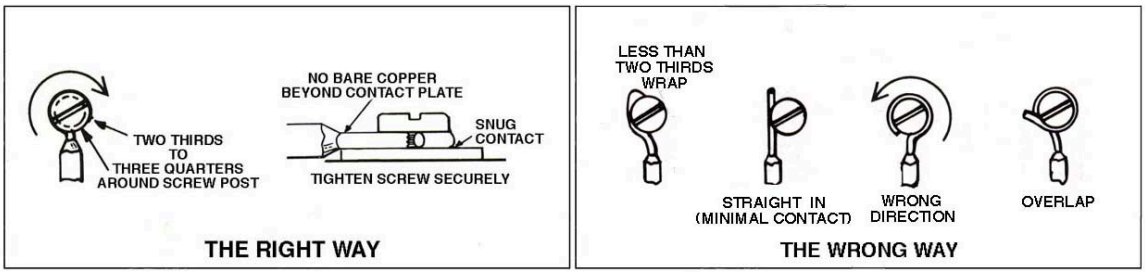
AT THE FIXTURE

After you have run the Romex from the fixture to the box that will hold the wall switch, it is time to connect the wire to the fixture and the switch. Strip 5/8" of insulation from each wire.

1. In the junction box holding the lighting fixture, attach the black "hot" wire from the power source to the white neutral wire of the switch loop (the one you "tagged" with black electrical tape in the fixture box and the switch box) with a correctly-sized wire nut.
2. Next, attach the black wire of the fixture to the black wire of the switch loop with a wire nut.
3. Then, attach the white "neutral" wire from the power supply to the white fixture wire.
4. Finally, even if the fixture box is not grounded, attach the bare wire to the boxes. (Later on, the house may be rewired and there will be one less place to run a ground wire.)

AT THE SWITCH

At the switch, use your wire cutter to create a loop in the black wire. Place the loop under one of the screws on the switch, and tighten the screw down on the wire. (If you position the loop so that it goes in the same direction that the screw tightens *(see illustration)*, the wire is more likely to stay in position.) Connect the white “tagged” wire to the other screw in the same way.



Wrap the wire loop two-thirds to three-quarters around the screw post, in the direction the screw tightens

FINISHING UP

Turn on the power to the circuit, and test to see if everything works. If so, compress the wires into each box and screw the switch and fixture in place.

The final part of the job is to repair the walls that you had to tear open. *(If you will be doing this job yourself, see separate handout on “Plaster and Drywall Repair.”)*

Home Repair Resource center

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

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