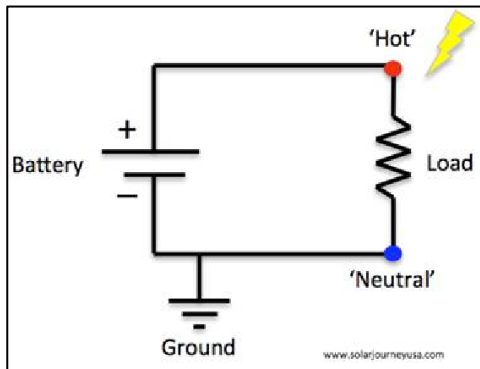


Basic Electrical – Outlets, Switches, & Light Fixtures

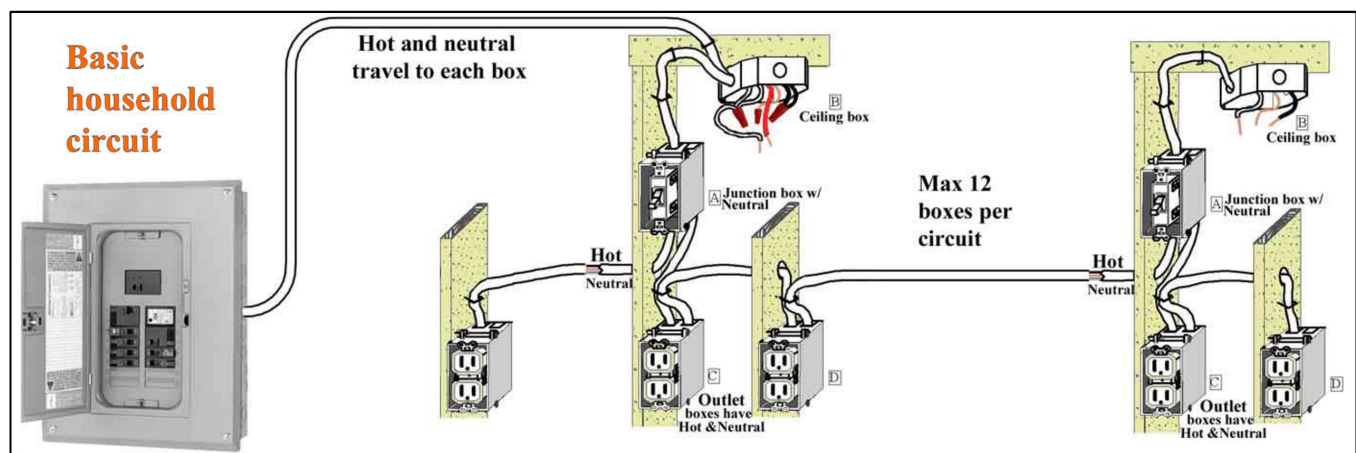
Electrical Circuit



Hot – Black Wire (Brass Screw) – The ungrounded conductor. Completes electrical circuit loop with neutral conductor. This is the conductor that has voltage.

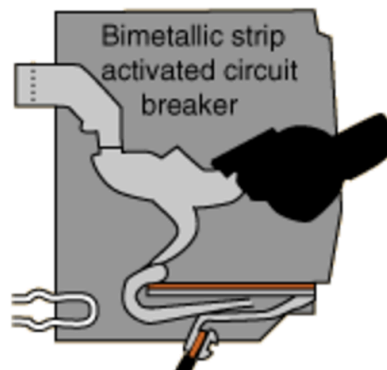
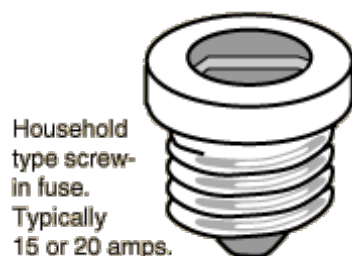
Neutral – White Wire (Silver Screw) – Connected to ground conductor at the neutral point in the system (main circuit panel). Completes electrical circuit loop with hot conductor. Does not have voltage (while circuit is open).

Ground – Copper Wire (Green Screw) – Safety conductor. Connected to earth ground. Carries current only during a short circuit or ground fault condition.



Fuses & Breakers

Fuses and breakers limit the current which can flow in a circuit. The metal filament in the fuse melts and breaks the connection, whereas in a breaker, the heating effect on a bimetallic strip causes it to bend and trip a spring-loaded switch.



Evolution of Electrical Outlets

- 2-prong outlet
 - o Basic circuit
- 3-prong outlet
 - o Introduction of ground wiring
- GFCI
 - o Introduction of ground-fault circuit interruption

Outlet/Switch Wiring Connections

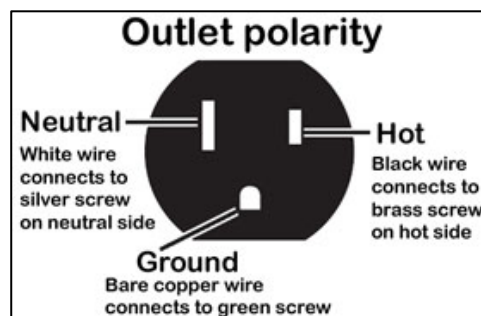
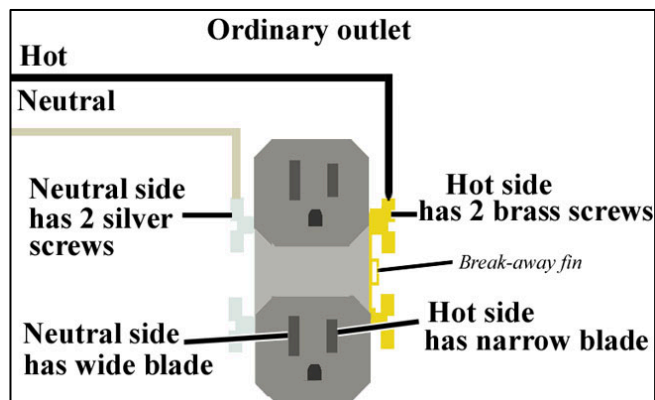
- Push-in hole (spring cleats w/ release tab) – not recommended
- Side-screws (hooked wire)
- Side-screws with clamp (straight wire)
- GFCI clamp (reverse clamp)
- Wiring nut

Pitfalls

- Power
 - o 120 volt vs 240 volt
 - o 15-amp vs 20-amp
- Electrical box issues
 - o Recessed too far
 - o Loose
- Deteriorating wiring
 - o Brittle wire
 - o Damaged insulation
- Wires unlabeled/mislabeled
 - o Distinguishing hot, neutral, travelers, & ground

Basic Electrical – Outlets, Switches, & Light Fixtures

Standard Outlets

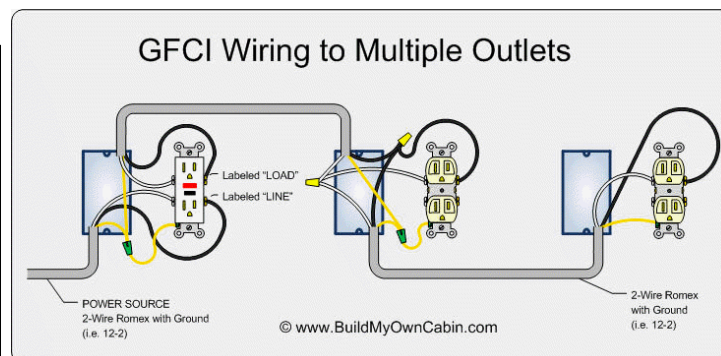
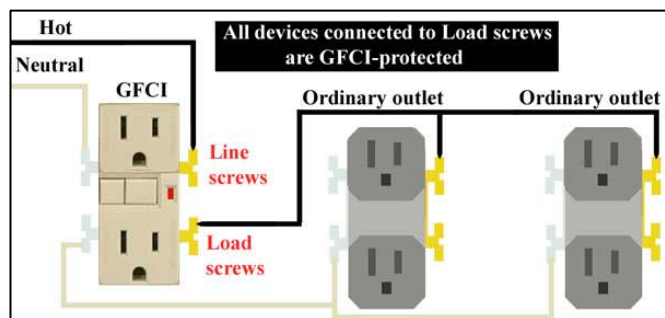


GFCI Outlets

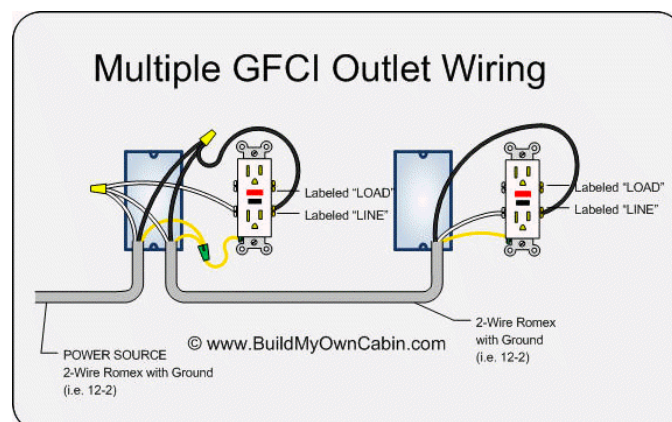
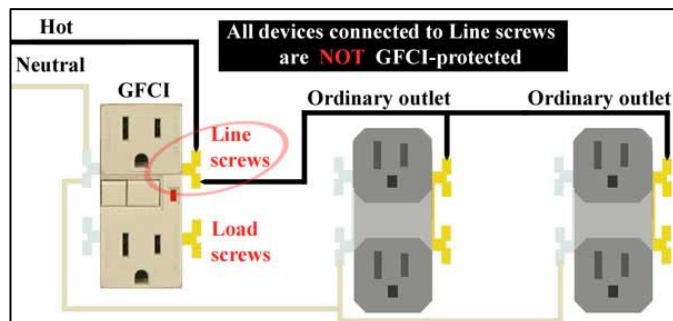
Ground Fault Circuit Interrupter

- Will trip when current from the hot does not return through the neutral (ground fault).
- Must use in rooms with water (kitchen, bathroom, laundry) and with any outlets that do not have ground wires (along with “No Equipment Ground” stickers).

Load Connection



Line Connection

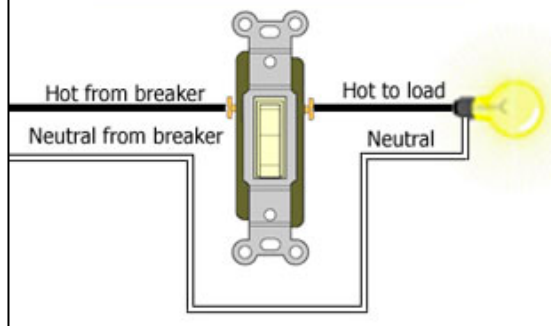


“Line Connection” is the preferred set-up of outlets in ICC houses, with each outlet having its own GFCI protection. Interconnected (load connected) outlets cause issues and confusion with our old, non-systematic wiring set-ups.

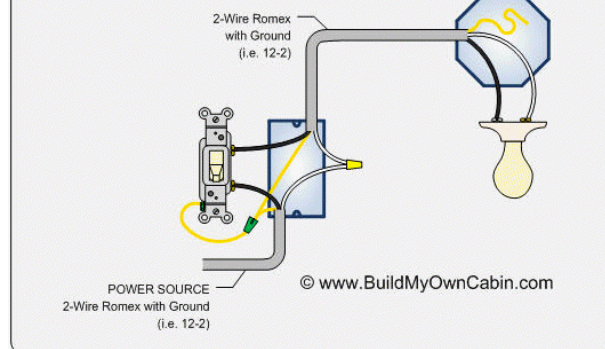
Basic Electrical – Outlets, Switches, & Light Fixtures

Switches

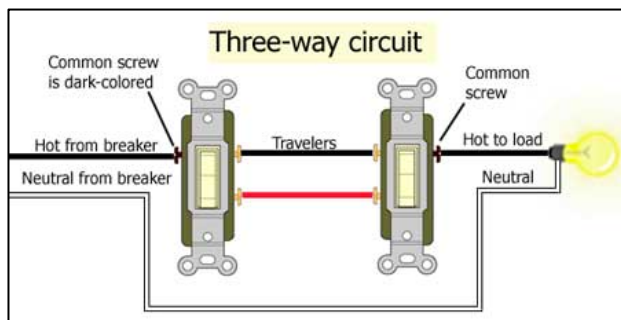
Single-pole circuit



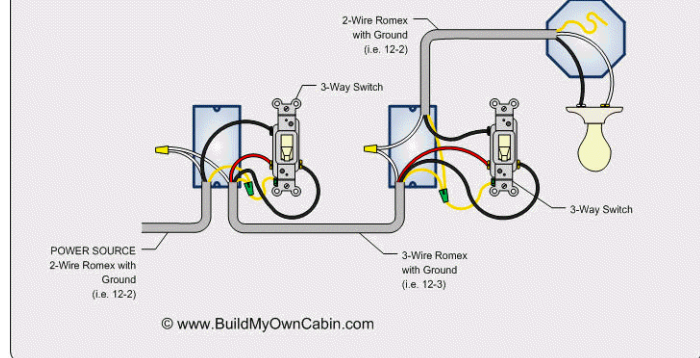
Basic Light Switch



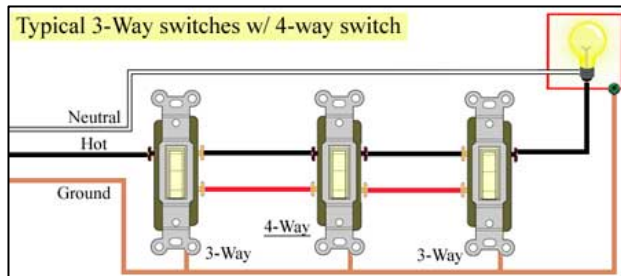
Three-way circuit



Basic 3-Way Switch



Typical 3-Way switches w/ 4-way switch



4-Way Switch

