

Name _____

Date _____

Period _____

Engineering Technology Department

Devices - Receptacles

DEVICES

The NEC® defines a device as a unit of an electrical system that is intended to carry but not utilize electric energy. Components such as switches, receptacles, attachment plugs, and lamp holders are considered devices because they distribute or control, but do not consume, electricity.

Receptacles

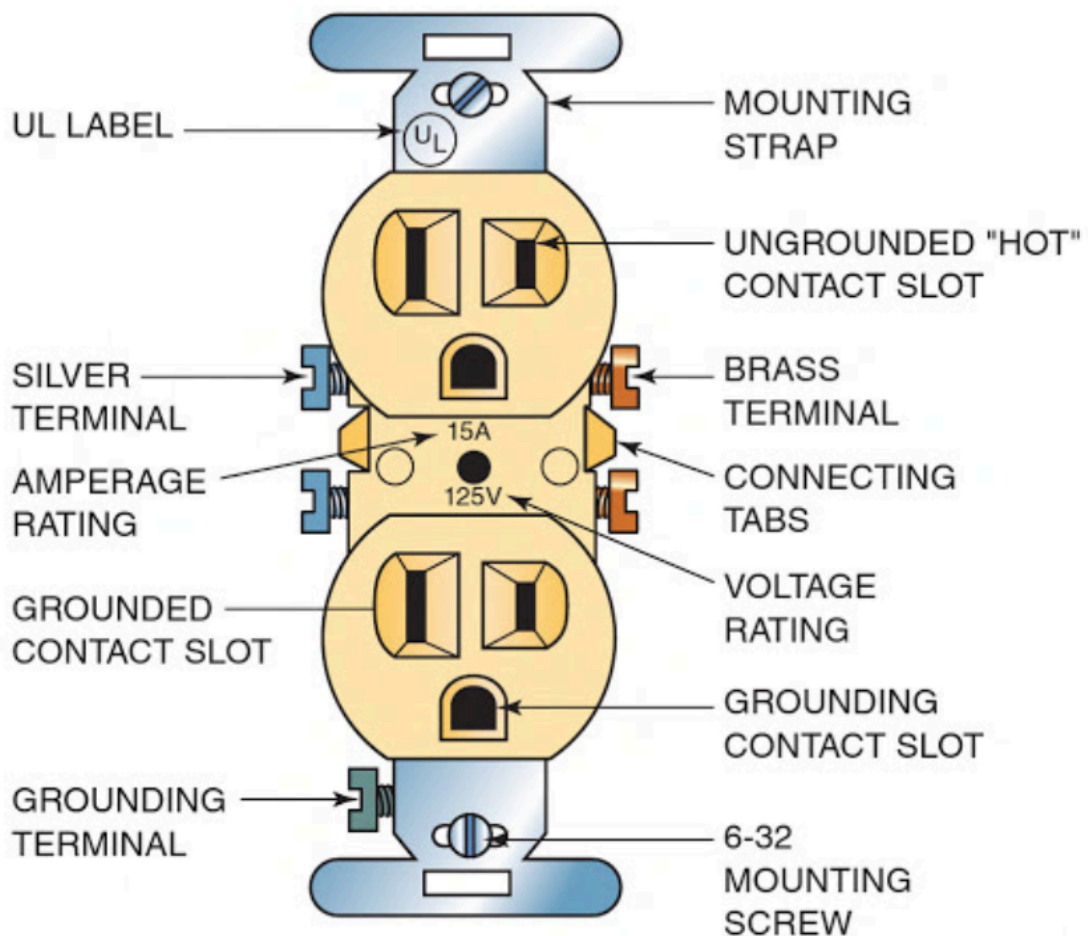
Receptacles are probably the most recognizable parts of a residential electrical system

The most common type of receptacle used in residential wiring is a duplex receptacle rated for 15 amperes at 125 volts. It consists of two single receptacles on the same mounting strap. The short contact slot on the receptacle receives the "hot" conductor from the attached cord. The long contact slot receives the grounded conductor from the attached cord. There is a U-shaped grounding contact that receives the grounding conductor.

Silver screws are located on the side with the long contact slot and are used to terminate the white, grounded circuit conductor. Brass or bronze-colored screws are located on the same side as the short contact slot and are used to terminate the "hot," or ungrounded, circuit conductor. A green screw is located on the duplex receptacle for terminating the circuit bare or green grounding conductor. There are several other features on a duplex receptacle that you should be familiar with.

The following features are usually found on the front of a receptacle:

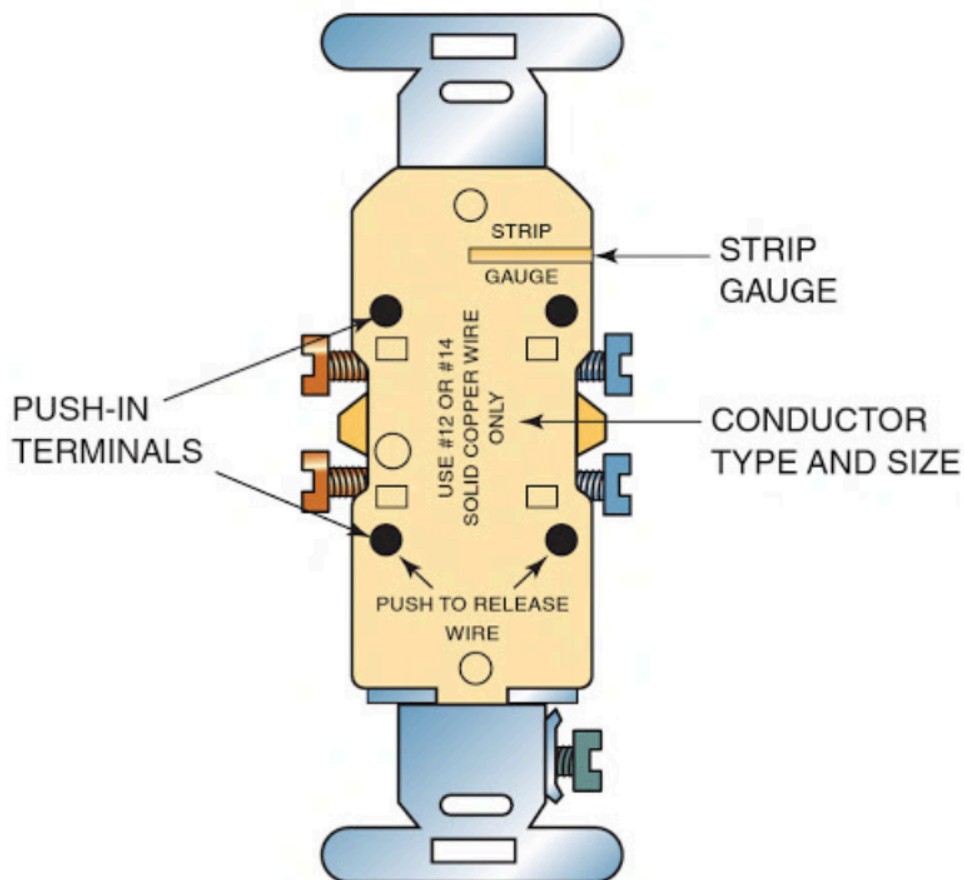
- **Connecting tabs:** These are used to connect the top half and the bottom half of the duplex receptacle. They can be taken off to provide different wiring configurations with "split" receptacles.
- **Mounting straps:** These are used to attach the receptacle to a device box. Receptacles will have 6-32 screws held in place by small pieces of cardboard or plastic in the mounting straps.
- **Ratings:** Both the amperage and the voltage rating of the receptacle are written on the receptacle..
- **NRTL label:** A label from an NRTL (Nationally Recognized Testing Laboratories) like UL will be on the receptacle.



The following features are usually found on the back of a duplex receptacle:

- **Push-in terminals:** Sometimes called "backstabs," these are used when electricians strip a conductor and push it into the hole rather than terminating on the screws.

- **Strip gauge:** This gauge is used to let the electrician know how much insulation needs to be stripped off the conductor when using the push-in terminals.
- **Conductor size:** This will tell the electrician what the maximum conductor size is for this device. Most duplex receptacles are rated for 14 or 12 AWG conductors.
- **Conductor material markings:** These markings will indicate what conductor material is okay to use with the device. "CU" indicates that only copper conductors can be used, "Cu-Clad Only" indicates that only copper clad aluminum can be used.



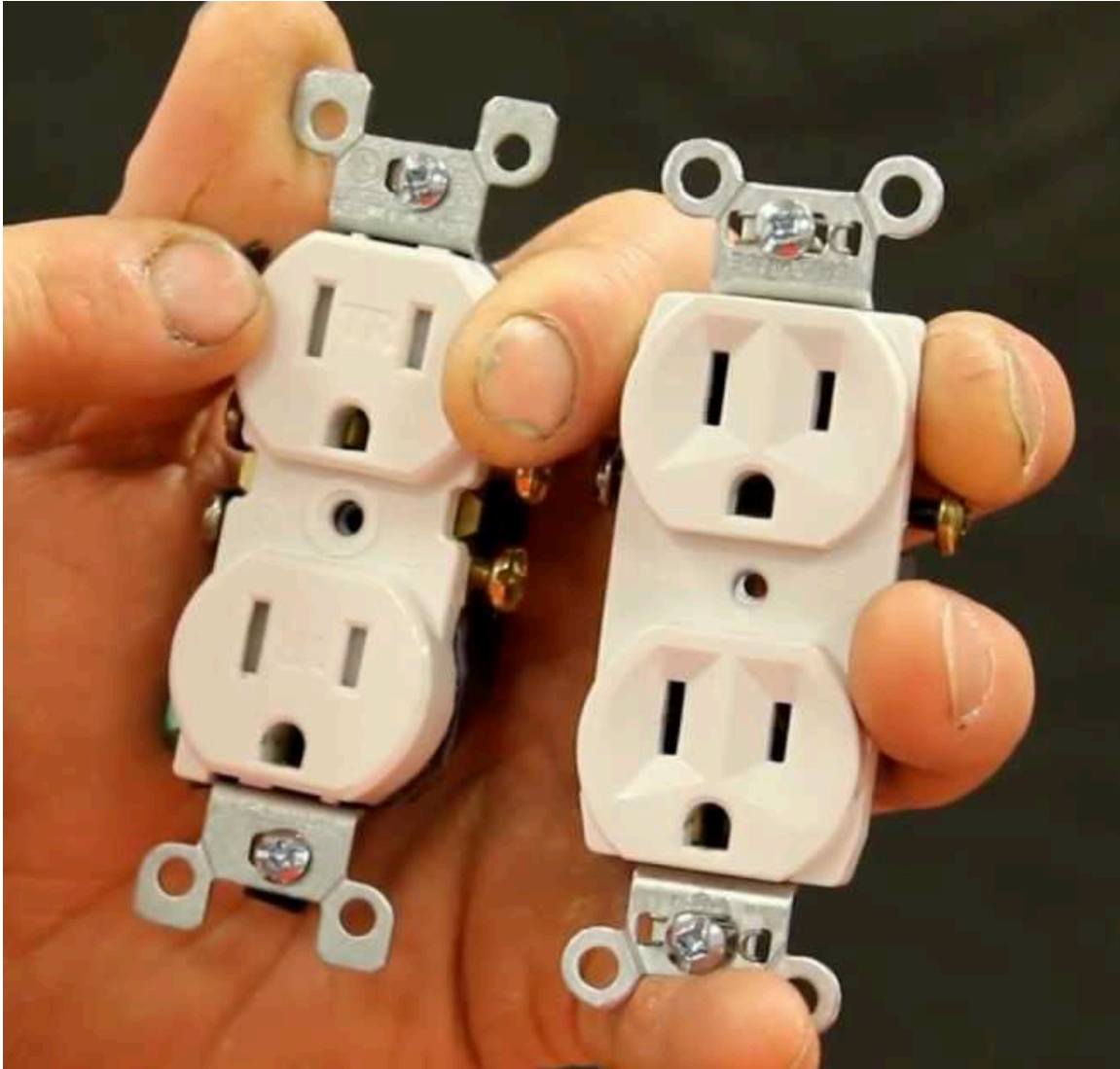
20 Amp Receptacles

An example would be the receptacle installed for a washing machine, which is usually a single receptacle with a 20-ampere, 125 -volt rating.



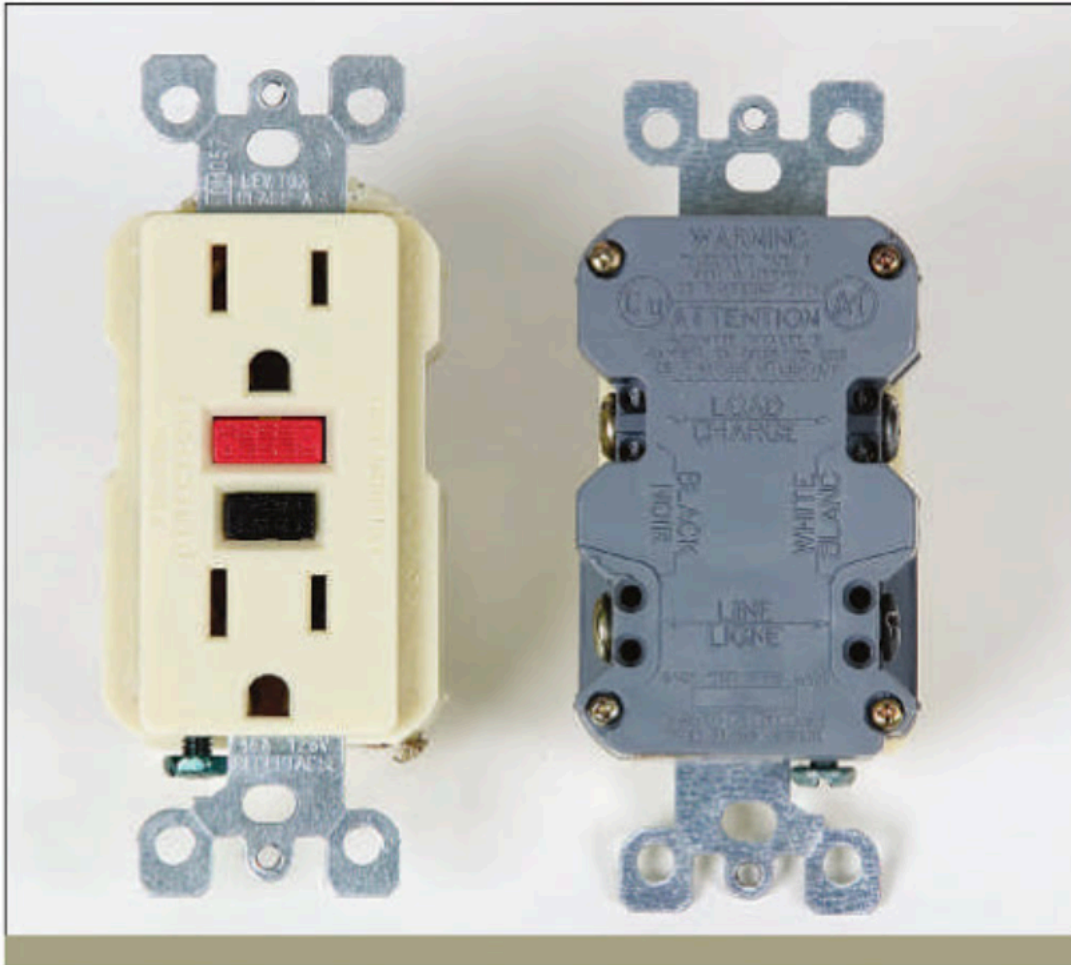
Tamper-resistant

Almost all receptacles in a house must be tamper-resistant. The style of tamper-resistant receptacle most used has shutters across the slots of the receptacle that will not allow individual items like a paper clip to be inserted into the slot. The only way the shutters will open is when a two-prong or three-prong attachment plug is pushed into the slots. **The intent of this requirement is to protect children** from shocks and burns that could occur if they stick something conductive into the slots of a receptacle.



GROUND FAULT CIRCUIT INTERRUPTER RECEPTACLES

Duplex receptacles installed in residential wiring are available in a ground fault circuit interrupter (GFCI) type. In addition to their use as duplex receptacles, GFCI receptacles also protect people from electrical shock. Several locations in residential wiring are required by the **National Electrical Code** to have GFCI protection. Some of these locations include kitchens, bathrooms, and basements.



SPECIAL RECEPTACLE TYPES

Some circuits are intended to feed only one piece of equipment. Usually, this equipment requires a special receptacle that is larger and has a different configuration than the single or duplex receptacles previously covered.

In residential wiring, there are two appliances that typically require a special receptacle installation: **the electric range and the electric clothes dryer.**

- The range requires a heavy-duty, 50-ampere, 220-volt-rated receptacle and attachment plug for its installation.
- The dryer requires a heavy-duty, 30-ampere-, 220-volt-rated receptacle and attachment plug.

