

# Plugs & Batteries

Plugs and batteries can go one of two ways.  
It's easy to get them backwards.

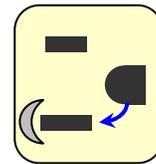
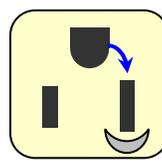
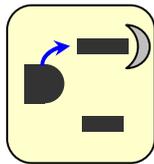
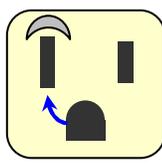
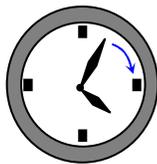
## Which Way Does the Plug Fit?



When a 3-prong receptacle is hard to see, say behind a sofa, is there a way to know which side has the larger slot that will accept a 2-prong plug's larger neutral prong?



From the open mouth, move *clock-wiDe* to the wide eye!



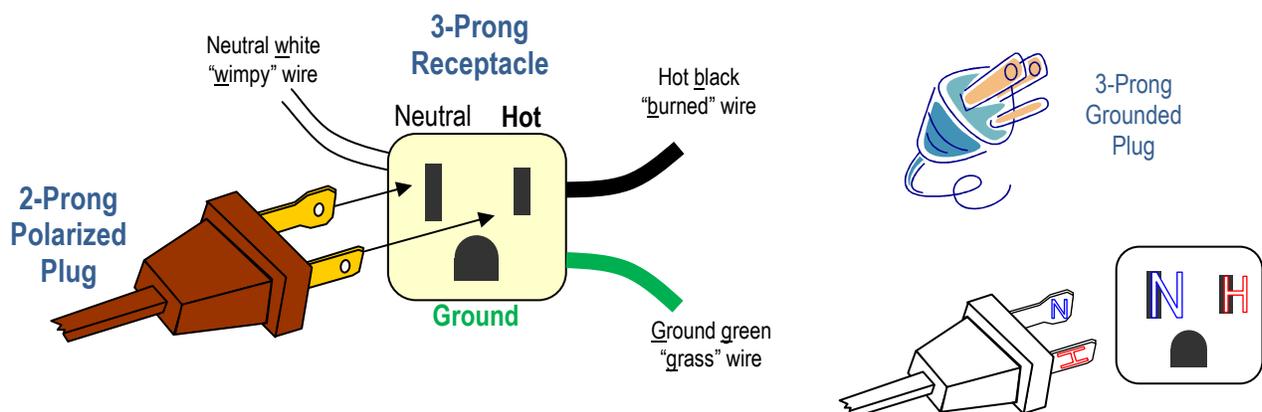
Visualize a *clock* and a *wise* old man. Imagine the 3-prong receptacle is the man's face looking out at you. From his open mouth, travel *clockwise* (*clock-wiDe*) to his wide eye. Rotate the plug so the large neutral prong fits into his wide eye.

## Why are there 2-prong and 3-prong plugs?

Household electricity flows from the "hot" side of wiring to the "neutral" side. To prevent electricity from a defective appliance flowing through *you*, the neutral side is also wired to the ground at the main electrical panel, typically via a rod or pipe embedded in the earth. The ground is a great conductor of electricity (think lightning).

Most plastic appliances use a 2-prong polarized plug with a larger neutral prong to make sure you plug it in the correct way. Other appliances (metal-cased; used near or with water; containing sensitive electronics) use a 3-prong plug that has an extra semi-round "ground" prong for further protection.

In contrast to the neutral wire, which is the return path for electricity, the ground wire has no electricity flowing through it—unless an appliance becomes defective, say through a frayed wire that makes contact with the outer casing and energizes it. The ground circuit protects you from a fatal shock.

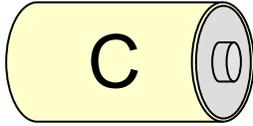


# Battery Polarity

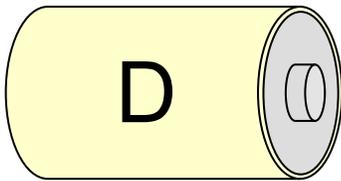
## 1.5 Volt Battery Family



Twice as much current as AAA



Seven times AAA

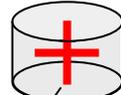


Sixteen times AAA

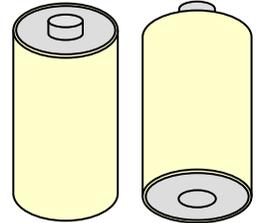
## Which End Is Which?



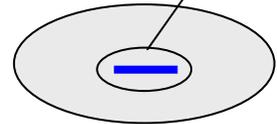
Imagine a Positive Plus sign fitting inside the Pole on top of the battery.



You can *feel* a battery's positive pole and negative bottom, even in the dark.

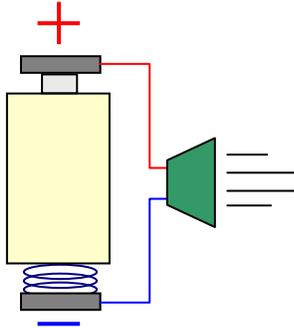


Imagine a flat negative sign painted on the flat bottom of the battery.



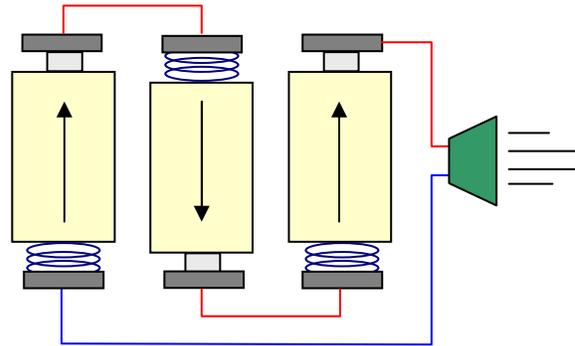
## Which End Goes Where?

The positive pole *pokes* the solid contact of a device's battery receptacle.



The *flat* negative bottom rests on a spring (imagine a stack of *flat* pancakes) or a flexible contact.

In devices that take more than one battery, each battery will typically face the opposite way.



## Your Turn!

*True or False*

- \_\_\_\_\_ The larger slot in a 3-prong receptacle is clockwise from the ground hole.
- \_\_\_\_\_ Metal-cased appliances typically have a 3-prong plug for extra safety.
- \_\_\_\_\_ The protruding pole on a 1.5 volt battery is positive.

Answers: True, True, True