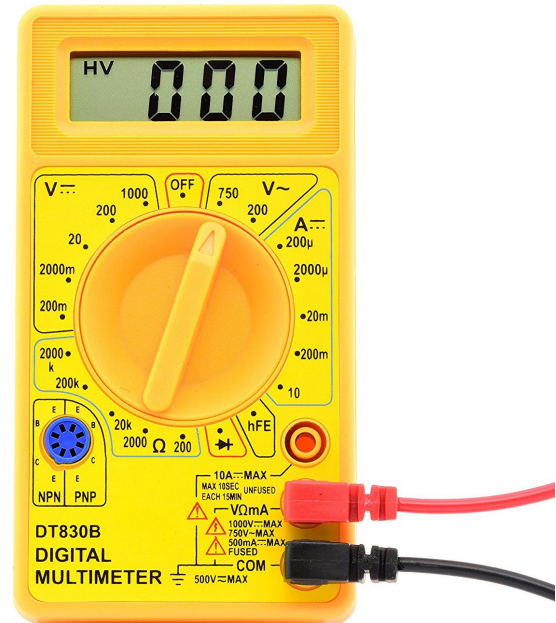


The Tools

We use a multimeter to read the values of voltage and current in a circuit. There is another device to read resistance - but it's expensive and we ain't gone one.



A voltmeter measures ... voltage.

Remember voltage equals potential difference... this means that all measurements of volts are actually ΔV . As such it must measure the difference between two points.

MUST be hooked up in parallel. ie: hook the meter up to either side of the component that you want the voltage of.

An ammeter measures ... amps.

This is a measure of how many electrons pass a point in a period of time. As such you will need to hook it up in series. You need the electrons to pass through freely.

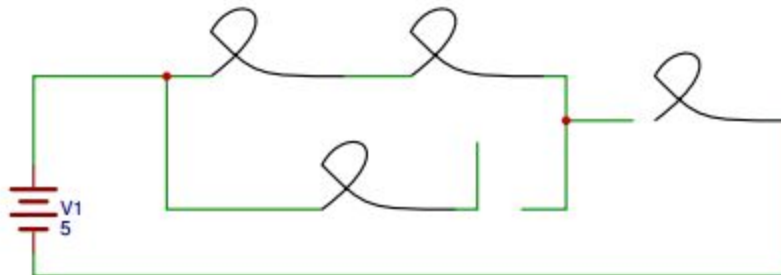
Each meter has its own issue with logic... An ammeter must allow the electrons (current) to pass through unhindered... this means that it must have zero internal resistance. This is impossible. A

voltmeter can not allow any current to avoid the component it is trying to measure. As such it must have infinite resistance. This is impossible.

A simple ammeter:
The brighter the bulb, the more current is passing through.

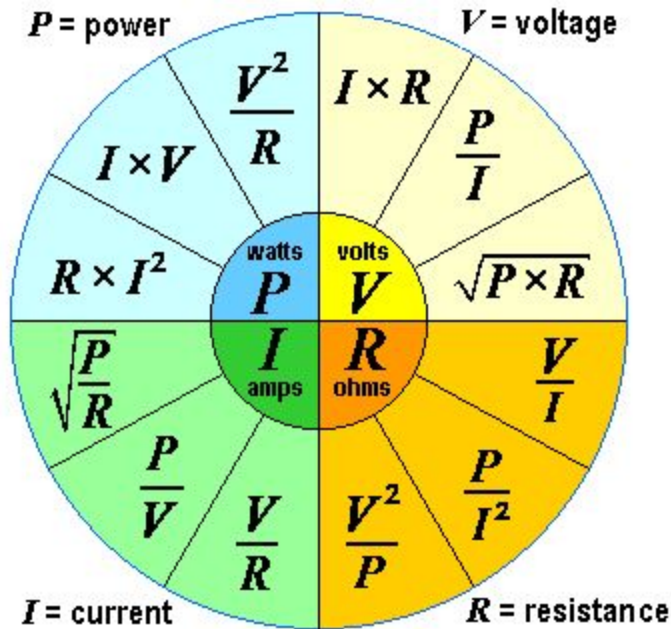


What would happen if the switch was closed?



$$V = IR \quad P = IV$$

We combine the above two formulas in many ways to solve power / voltage questions.



A bratty kid watches 16 hours of TV / day. He does this everyday for a month (assume 30 days). The TV draws 2A of current. If electricity costs \$0.12/kWh how much does the TV watching cost?

Hint: 12.67

A 60W light bulb is run 24 hours a day all month. What is the cost? (Assume 30 days in the month and electricity costs of \$0.12/kWh)

Hint: \$5.18

If that light was an led it would take about 9watts. How much does the bulb cost now?