

Using a Multimeter “Cheat Sheet”



Measuring Voltage:

- Voltage is the difference in electrical potential between two places in the circuit
- We therefore measure voltage **across** an element, meaning that we connect the multimeter in **parallel** with the element of interest
- To prevent the multimeter from changing the circuit, we want **very little current** to flow through the meter, so the meter needs to have a **very high resistance**



Measuring Current:

- Current is the measure of how fast electrical charges move through a branch of the circuit
- We therefore need all of the current passing **through** an element to pass through the multimeter, meaning that we connect the multimeter in series with the element of interest
- To prevent the multimeter from changing the circuit, we want **as small a voltage drop** across the meter as possible, so the meter needs to have a **very low resistance**

Setting the Dial:

- There are four settings on the multimeter. In general, we will be using DC voltage ($V_{=}$) measured in “Volts” and DC current ($A_{=}$) measured in “Amps,” hence the “V” and “A” designations on the multimeter.
- The numbers along the dial represent **ranges of measurement**. For instance, the first range of measurement on the voltage side of the meter in the images above is from 200mV to 2V. If your expected reading is less than 200mV, you should set the dial to 200m. If it's greater than 200mV, but less than 2V, you should set the dial to 2, etc. The values get larger in the clockwise direction around the dial.