

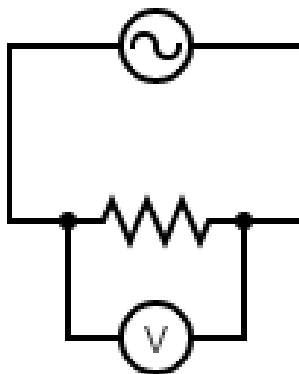
Lab 5

Multimeter Instructions

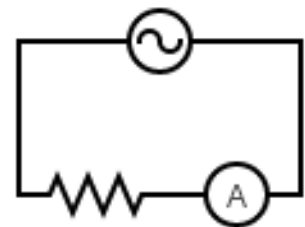
A multimeter is a device that can serve as both an ammeter to measure current, and a voltmeter to measure voltage. It can also measure resistance, but we won't be using this feature for this lab.



Multimeter



Circuit diagram for measuring voltage across a resistor. The multimeter is in parallel with the resistor.



Circuit diagram for measuring current through a resistor. The multimeter is in series with the resistor.

Measuring Voltage

When measuring voltage, we always want one wire connecting to the *COM* port in the middle, and the other wire connected to the *V* port on the right. Then we have to figure out whether we are measuring the voltage for an alternating current (AC) circuit, or a direct current (DC) circuit. If we have an AC circuit, we want to turn the center knob to \tilde{V} . If we have DC current, we want to turn the knob to \overline{V} .

Now that we have the multimeter set up to measure voltage correctly, we need to connect it to our circuit properly. When measuring the voltage across a circuit element, usually a resistor, we need to make sure the multimeter is in **parallel** with our circuit element. This allows the multimeter to measure the voltage drop across our circuit element. If you're having trouble with this, see the above circuit diagrams. If you find that the change in voltage is negative, that just means the current is going the opposite way you expect. You can just swap the *COM* and *V* ports to change the direction, and now your voltage change should be positive. If a video would be more helpful, try this [link](#).

Measuring Current

When measuring current, we always want one wire connecting to the *COM* port in the middle, and the other wire connected to the *A* port on the left. Then we have to figure out whether we are measuring the voltage for an alternating current (AC) circuit, or a direct current (DC) circuit. If we have an AC circuit, we want to turn the center knob to \tilde{A} . If we have DC current, we want to turn the knob to \overline{A} .

Now that we have the multimeter set up to measure current correctly, we need to connect it to our circuit properly. When measuring the current through a circuit element, usually a resistor, we need to make sure the multimeter is in **series** with our circuit element. If you're having trouble with this, see the above circuit diagrams. This allows the multimeter to measure the same amount of current that goes through our circuit element. If you find that the current is negative, that just means the current is going the opposite way you expect. You can just swap the *COM* and *A* ports to change the direction, and now your current should be positive. If a video would be more helpful, try this [link](#).