Lab #1 - DC-CIR

(*updated May 24, 2017*)

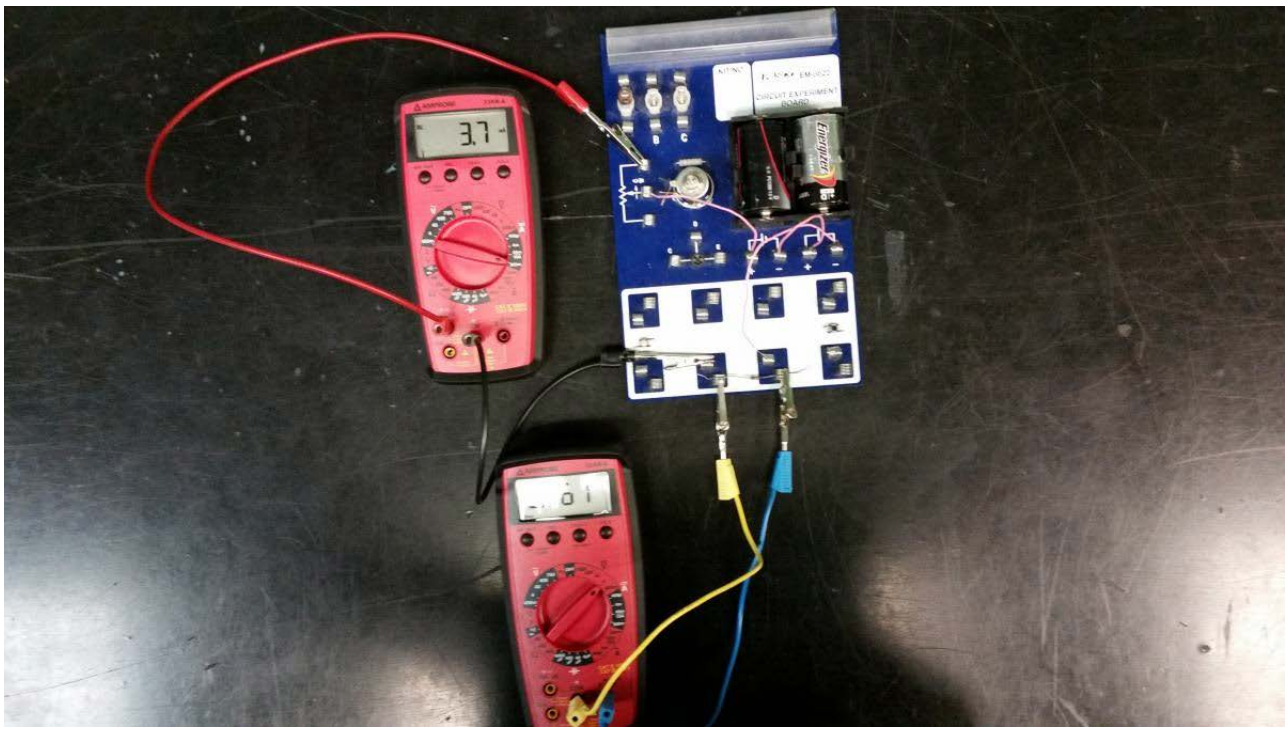
It is better NOT to fill in the worksheet as you do the lab. The worksheet is not turned in for another week and you can complete it more carefully if you delay filling it in until later. All of your data (and analysis) needs to be entered into your notebook anyway. Although the carbon copy of your notebook must be handed in before you leave the lab, you will still have the original copy in your hands and can use it to complete the worksheet.

Section A. Introduction:

The second sentence of the last paragraph states that the worksheet is due one week after doing the lab!

Section D. Ohm's Law

Figure 5 in your manual, the circuit layout, only shows the bottom two-thirds of the Pasco board. Orient the board with the 4 spring 'pads' along the bottom (*and below the batteries*) when you construct this circuit, as shown below.



Use as many significant figures as possible on your DMM - this will usually be 3 or 4. If you have only 1 or 2 significant figures, try to use a more sensitive scale if one is available.

When using the DMMs, remember to plug the probes into the proper jacks - you always use the common jack for one probe, by convention this is usually the black one, but different jacks must be used for the second probe for current measurements as opposed to voltage or resistance measurements.

If you find that the readings on your DMMs are erratic, try the following:

1. Usually, this is due to loose connections. Wiggle each of your connections while watching your DMMs to see if you can spot the troublemaker.

2. The battery sockets may be slightly oxidized. Rotate the batteries slightly.

3. The various switches and pots on the board can have poor internal connections. Press the buttons a few times and rotate the pot (*if it's connected to your circuit*) to see if they are causing the trouble. Sometimes the pots will be noisier at the very end of their limits of travel. Back it off a quarter of a turn and, if your circuit behaves better, don't use the pot at its limits.

4. Because they are bent so frequently, we have seen wires that break INSIDE their insulation where you can't see the break. In this case, wiggling the wires will usually cause the DMM readings to jump.

5. A previous user may have fried your DMM. Try a simple reading with the meter to see if it works or try temporarily substituting another DMM.

6. Ask for help and possibly for a replacement board or DMM.

Section E.2. Combinations of Resistors

Note that you are NOT supposed to measure the sum of the series (or parallel) resistors with the ohms function of your DMM. You are to determine these sums from your measurements of V and I. This is the experimental sum that you must enter in the fourth column of the tables you must create.