# Circuits Lab

**Procedure**

Briefly, but completely, describe the procedure for this lab – and include labeled sketches.

**Data**

Part I

| $R_1$ | $I_1$ | $R_2$ | $I_2$ |
|---|---|---|---|
| | | | |

Part II

| Round Bulb | | |
|---|---|---|
| V | I | P |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

| Tall Bulb | | |
|---|---|---|
| V | I | P |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |
| | | |

Part III

| Branch | R | V | I |
|---|---|---|---|
| 1 | | | |
| 2 | | | |
| 3 | | | |

**Graphs**

Graph voltage vs. current for each bulb in Part II on the same graph. Use different colors for the data points and best fits line. Make sure that the slope is resistance.

**Questions**

1) Use the data you collected in Part I to calculate the internal resistance and EMF of the D battery you used. Show all work and include a circuit diagram.

2) Calculate the power of each bulb for each trial in Part II. Complete your data table and show one example of your calculation. Is there a consistent relationship between power and brightness of a bulb? Use qualitative and quantitative analysis of your power calculations and your direct observations. Use circuit diagrams to help explain.

3) Find the slope for both lines of your graphs. Show your work.

4) Draw a circuit diagram for Part III, labeling the actual resistances and voltages. Use Kirchoff's Laws to calculate the currents on each branch (yellow, blue & red) of the circuit. Compare calculated currents to your measured currents. Explain your results.

**Error Analysis**

Thoroughly explain what the main sources of error are for this lab, and how you would correct them.