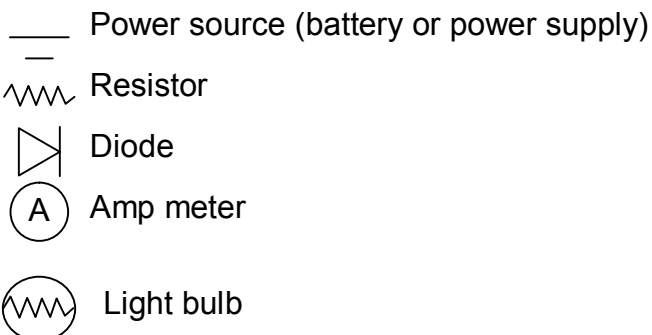


## OHMS LAW LAB

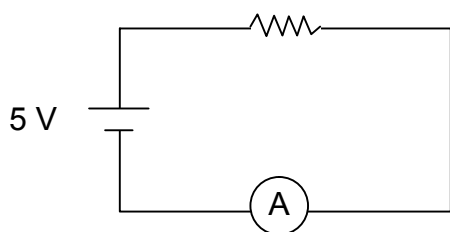
### Equipment:

Power supply  
 Bread board  
 Wires  
 2 known resistors  
 1 unknown  
 Light bulb and socket  
 LED diode  
 Amp meter



### Procedure:

1. Check your circuit. Wire the following circuit with one of your known resistors (use a resistor of  $82\ \Omega$  or higher), an amp meter and a 5 V power supply.



$V = 5V$   
 $R = \underline{\hspace{2cm}}$

$V = IR, \text{ so } I = \frac{V}{R}$

Calculate expected current  $I_{\text{theory}} = \underline{\hspace{2cm}}$

Calculate meter reads  $I_{\text{exp}} = \underline{\hspace{2cm}}$

Percent difference =  $\frac{I_{\text{exp}} - I_{\text{theory}}}{I_{\text{theory}}} * 100$

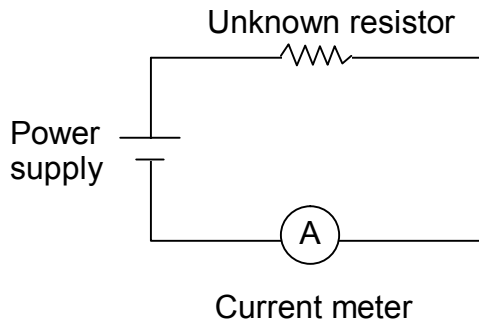
The percent difference =  $\underline{\hspace{2cm}}$

Now list (in order of importance) the reasons that  $I_{\text{exp}}$  is different from  $I_{\text{theory}}$  above

- 1.
- 2.
- 3.

2. Find the value of an unknown resistor.

Make the following circuit

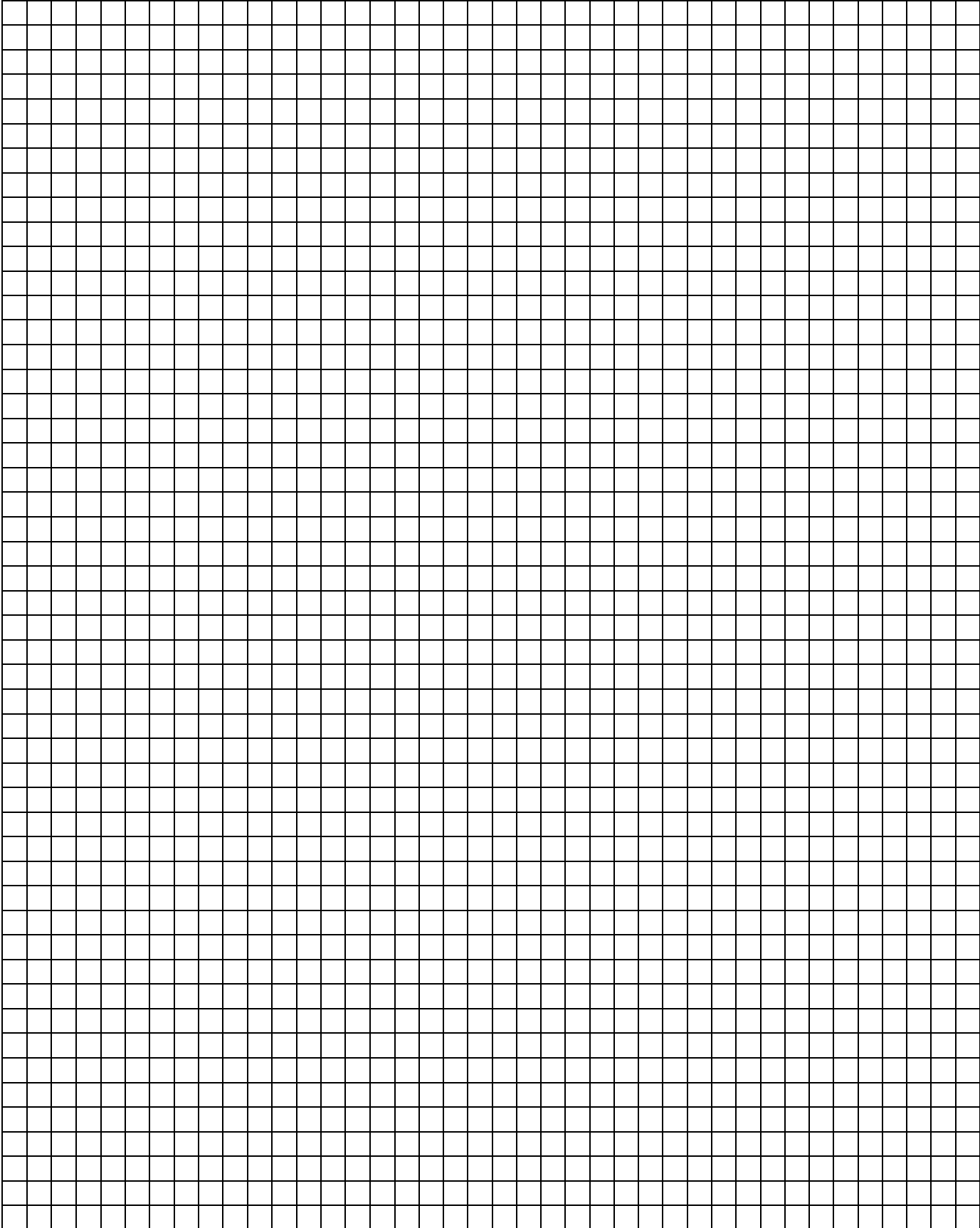


Step the voltage by 2 volts from 0 V up to 10 V. Fill in the table below and make a graph on your graph paper (see next page).

| V (in Volts) | I (in Amps) |
|--------------|-------------|
| 0            |             |
| 2            |             |
| 4            |             |
| 6            |             |
| 8            |             |
| 10           |             |

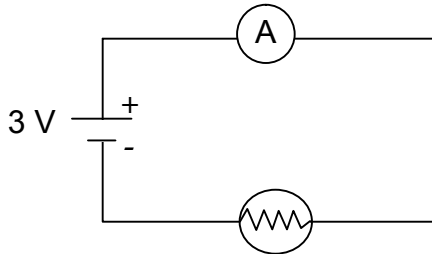
Draw the **best-fit line** on your graph to all the data point above (use a ruler) to find the slope which is related to the resistance. OR use the computer (Graphical Analysis program) to do it all for you! Note: think about what the slope is following the  $y=mx$  compared to  $V=IR$  formula

Resistor value is \_\_\_\_\_



3. Resistance of a light bulb  
Make the following circuit on you bread board

MAKE SURE POWER SUPPLY IS **AT OR BELOW 14V** – a higher voltage will break the bulb)



4. Measure the current and calculate the resistance of the light bulb.

R = \_\_\_\_\_

Question: if this light bulb was connected to 120V (voltage of a normal plug) how much current would it draw? I = \_\_\_\_\_

Would this much current blow a fuse in your house? (find out!) circle: yes/no

5. An LED is a diode-light and it only works one way (i.e. it matters which side you connect to positive and which to negative). In the circuit above, replace the light bulb with an LED light (if it doesn't light-up, flip it!)

Now vary the voltage by 0.5 V from 1.5V up to 5V. Make the  $I$  vs.  $V$  graph.

(Note: I want you to switch the axis  $I$  is the y-axis and  $V$  is the X-axis)

