Name: _____ Period: _____

Investigation 20A: Electricity (25 points)

Part A: Conductors and Insulators

1. Build the circuit on page 108 in your lab book. Than break the connection between the light bulb and the battery and complete the circuit with the materials below. Indicate which are conductors (complete circuit and allow light bulb to come on) and which are insulators (bulb does not come on).
   a. Paper Clip _____ d. Air _____
   b. String _____ e. Coin _____
   c. Rubber Band _____ f. _____: _____
2. What do the conductors have in common? Why do you think they are conductors (think electrons)?
   _____

Part B: Measuring Voltage of a Battery

1. Turn the dial of your multimeter to DC volts. Touch the red end of the multimeter device to the positive end of the battery and black wire to the negative end of the battery. Than measure the voltage of the four possible ways two batteries can fit together.
   a. One battery (red to (+), black to (-): _____volts c. Two batteries (+) to (+): _____volts
   b. Two batteries (+) to (-): _____volts d. Two batteries (-) to (+): _____volts

Part C: Measuring Current

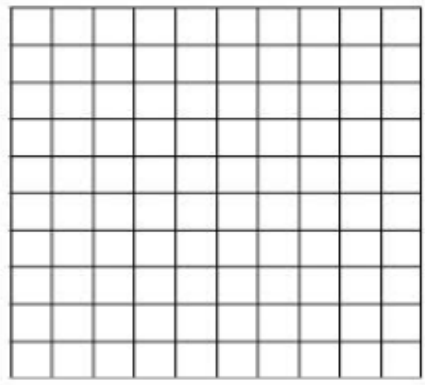
2. Build the simple circuit found on page 110 in your lab manual with the current running through the multimeter, and the multimeter set to DC amps.
3. Follow directions 2-4 on pg. 110. What is your current through the circuit? _____amps

Part D: A Circuit with a Dimmer Switch

4. A potentiometer is used to make a dimmer switch. Circle which of the following terms a potentiometer is acting as in an electric circuit: **Switch / Resister/ Battery / Light bulb**
5. Make a circuit like that found on page 111. You must also add your multimeter to the circuit.
6. Fill in the table below, and then graph Pot Dial Position (x-axis) and Voltage (y-axis). Don't forget a title, labeled axis, to use even increments, and to draw a line through your data point.

Table 1: Potentiometer and Voltage

Pot Dial Position	Voltage across bulb (V)
0	
2	
4	
6	
8	
10	



7. Is the relationship between volts and pot dial position a direct or inverse relationship? _____
8. Explain the results you got in Table 1. Why did you see what you saw? _____
   _____