Name _____ Date _____ Period _____

Electric Circuit Lab

Picture Diagram (Computer)

Situation #	Elements/ Circuit Type	Stamp
1	1 lamp in series	
2	2 lamps in series	
3	3 lamps in series	
4	4 lamps in series	
5	2 lamps in parallel	
6	3 lamps in parallel	
7	4 lamps in parallel	
8	See #8 on the back of this sheet	

Instructions

1.   Use the Crocodile Clips software to create each of the circuits described on the left. Click "Start"→All Programs→Crocodile Clips→Crocodile Physics 401→Crocodile. Choose "Blank Model". Select "Electronics(pictures)". Drag a battery to the blank screen. Add a "Filament lamp". Connect each terminal of the battery to the lamp: Click the **END** of the lamp wire and a picture of a "wire tape" will show up. Touch it to the battery wire and they will connect. Once circuit is closed, you will see the bulb light up. (Note: Click the crocodile button at the top left of the screen to "eat" the circuit elements to go on to the next situation). After you have created each situation and completed #2, #3, #4 below and #1 on the back of this sheet, have the teacher check it and stamp your lab sheet.

2.   On separate paper, for each circuit that you create on Crocodile Clips, draw a circuit diagram using the proper symbols to represent the elements of your circuit.

3.   On your circuit diagram label the current (I) and voltage (V) on both sides of each circuit element. These will be indicated as you move the cursor around your circuit.

4.   On your circuit diagram, rate the brightness of each of the lamps in your circuit using the following scale & symbols:
     Very Bright – VB
     Bright – B
     Dim – D
     Very Dim – VD

Answer the following questions for <u>each</u> of the situations (#2 – 7) in the lab. Record your answers in the data table and choose from the answers choices provided for you.

1. Find the <u>voltage across</u> each of the elements in the circuit. Do this by finding the difference between the voltages indicated on either side of each element.

2. How does the <u>voltage across</u> <u>each</u> lamp compare with the <u>voltage across</u> the battery?

3. How does the <u>voltage across</u> <u>all</u> the lamps compare with the <u>voltage across</u> the battery? In other words, if you didn't know what the voltage was across the battery, but you knew the voltages of each element, how could you figure out the voltage across the battery?

4. How does the current through <u>each</u> lamp compare with the current through the battery?

5. How does the current through <u>all</u> the lamps compare to the current through the battery? In other words, if you didn't know what the current was through the battery, but you knew the currents through each element, how could you figure out the current through the battery?

6. How does the brightness of one lamp compare with that of the others?

7. How does the brightness of the lamps in this situation compare with the brightness of the lamps in the previous situation?

8. Make an 8th circuit with one bulb and a potentiometer (A.K.A. variable resistor) in series. What do you notice when you adjust the potentiometer? Can you think of a practical application for potentiometers? Without deleting the series circuit create another circuit with the potentiometer in parallel with the bulb. What do you notice? Discuss with your lab partner the possible explanations for what you see. NOTE: You <u>DO NOT</u> have to draw a circuit diagram for these circuits!!!

9. Calculate the resistance across one of the lamps in each circuit using Ohm's Law. Record this resistance somewhere near your circuit.

Place your answers to questions #2 - #7 in this data table.

Choose your answer from the following list (not all answers on list have to be used): **Add, Same, Brighter, Dimmer, One Half, One Third, One Fourth, D.A. (Doesn't Apply)**

Data Table	Situation #					
	2	3	4	5	6	7
Question # 2						
3						
4						
5						
6						
7						