

Name: _____

TA: _____

Series and Parallel Circuits Construction Lab

Pre-lab: Draw a series circuit using a battery, three light bulbs and wires. Then, draw a parallel circuit using a battery, three light bulbs and wires.

Series	Parallel

Predict and Explain:

After you have constructed both a series and parallel bulb circuit, make some predictions (hypotheses) on the following:

1. Do you think the bulbs in the parallel circuit or the series circuit will burn brighter?

Explain why:

2. If you remove a bulb in your parallel circuit, will the other bulb(s) still light? Explain why:

3. If you remove a bulb in your series circuit, will the other bulb(s) still light? Explain why:

Procedure:

1. Go to the Phet Colorado circuit simulator by googling “phet circuit construction kit”.

Series Circuit:

2. Construct a series circuit with 1 battery and 1 lightbulb. Do not change the numbers on the lightbulbs or resistors from the starting numbers in the phet simulator.
3. Add another lightbulb in series and observe what happens to the brightness of the lightbulb. Record your results in the tables below (table 1).
4. Add the final lightbulb in series and observe what happens to the brightness of the lightbulbs. Record your results in the tables below (table 1).
5. Measure the voltage and current across each lightbulb using the voltmeter and the ammeter. Record your results in the tables below (table 2 and 3).
6. Remove a lightbulb (without reconnecting the wires). Record what happens in the tables below (table 4).

Parallel Circuit:

7. Construct a parallel circuit with 1 battery and 2 lightbulbs. Do not change the numbers on the lightbulbs or resistors from the starting numbers in the phet simulator.
8. Add the final lightbulb in parallel and observe what happens to the brightness of the lightbulbs. Record your results in the tables below (table 1).
9. Measure the voltage and current across each lightbulb using the voltmeter and the ammeter. Record your results in the tables below (table 2 and 3).
10. Remove a lightbulb (without reconnecting the wires). Record what happens in the tables below (table 4).

Results and Observations:

- 1) What happens to the brightness of the lightbulbs when adding in more light bulbs to each circuit?

Series			Parallel		

- 2) Use a voltmeter to find the voltage across each of the light bulbs in each circuit.

Series			Parallel		
Lightbulb 1	Lightbulb 2	Lightbulb 3	Lightbulb 1	Lightbulb 2	Lightbulb 3

- 3) Use an ammeter to find the current across each lightbulb in each circuit.

Series			Parallel		

Lightbulb 1	Lightbulb 2	Lightbulb 3	Lightbulb 1	Lightbulb 2	Lightbulb 3
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4) Removal of lightbulb.

Series	Parallel

Analysis Questions:

1. Were your predictions about the brightness of the bulbs accurate? If not, what happened that was different from what you expected?

2. Were your predictions about what would happen if a bulb was removed from the parallel and serial circuits accurate? If not, what happened that was different from what you expected?

3. How can these results be applied to real-world electrical problems?