

Name: _____

Date: _____

Circuits

★ BIG IDEAS:

- When an electron has the ability to move in a circuit, it has potential energy. **Voltage** is the *difference in potential energy* between two points in a circuit.
- A voltage source pushes electrons through a circuit creating a **current** (the flow of electrons).
- A load (like a light bulb) slows down these electrons to transform their energy into another form (light light, and heat). This slowing down of electrons is called **resistance**

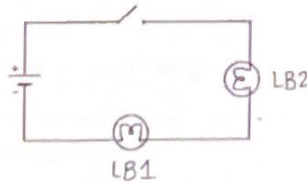
In this exploration activity you will be constructing two types of circuits and **making predictions** about their behaviours using your understanding of our Big Ideas.

Materials:

- 2 Battery cells
- Switch
- Voltmeter
- Two bulbs
- Connecting wires
- Ammeter

PART 1: SERIES CIRCUIT

1. Using the provided materials, construct the following circuit:



2. Close the switch and **observe** the two light bulbs.
3. What can you say about the approximate brightness of the two light bulbs? **Compare.** _____

4. **Form a prediction:** What will happen to both light bulbs if you unscrew light bulb 1? _____

5. *Unscrew light bulb 1.* What do you **observe**? Screw in the light bulb again after you have made your observations. _____

6. **Form a prediction:** What will happen to both light bulbs if you unscrew light bulb 2? _____

7. *Unscrew light bulb 2.* What do you **observe**? Screw in the light bulb back in after you have made your observations. _____

8. Imagine you are an electron leaving the negative terminal of the battery cell in a series circuit such as circuit 1.

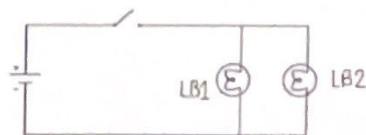
a. How many ways are there for you to travel through the circuit in order to arrive at the positive terminal? _____

b. How many light bulbs do you have to travel through? _____

Explain! In the series circuit, when one bulb is removed, is the other bulb still lit? Form a hypothesis to explain your observations. _____

PART 2: PARALLEL CIRCUIT

1. Using the provided materials, construct the following circuit:



2. Close the switch and **observe** the two light bulbs.

9. What can you say about the approximate brightness of the two light bulbs? **Compare.** _____

10. **Form a prediction:** What will happen to both light bulbs if you unscrew light bulb 1? _____

11. *Unscrew light bulb 1.* What do you **observe**? Screw in the light bulb again after you have made your observations. _____

12. **Form a prediction:** What will happen to both light bulbs if you unscrew light bulb 2? _____

13. *Unscrew light bulb 2.* What do you **observe**? Screw in the light bulb back in after you have made your observations. _____

14. Imagine you are an electron leaving the negative terminal of the battery cell in a parallel circuit such as circuit 2.

a. How many ways are there for you to travel through the circuit in order to arrive at the positive terminal? _____

b. How many light bulbs do you have to travel through? _____

Explain! In the parallel circuit, when one bulb is removed, is the other bulb still lit? Form a hypothesis to explain your observations. _____

