In today's activity, you will be creating parallel circuits and analyzing the current through and voltage across each resistor and in the total circuit.

**Materials:**
- battery holder
- two D-cell batteries
- light bulbs
- wire
- multimeter

**Pre-Lab Questions:**

a. Draw a schematic diagram of a circuit with two batteries and three bulbs wired in parallel

1. What is the same in each branch that are parallel to one another in a circuit?

2. What happens to the total current in a parallel circuit when more branches are added?

b. Create a circuit consisting of one light bulb connected to two batteries, and draw a schematic diagram
3. Measure the voltage across the two batteries: ________________ V

4. Measure the voltage across the light bulb: ________________ V

5. Measure the current in the circuit: ________________ A

6. How does the voltage across the two batteries compare to the voltage across the bulb?

   
   c. Create a circuit consisting of two light bulbs wired in parallel, connected to two batteries, and draw a schematic diagram

7. Measure the voltage across the two batteries: ________________ V

8. Measure the voltage across the first light bulb: ________________ V

9. Measure the voltage across the second light bulb: ________________ V

10. Measure the current in the first branch: ________________ A

11. Measure the current in the second branch: ________________ A

12. Measure the total current in the circuit: ________________ A
13. How does the voltage across each light bulb compare to the voltage across the battery?

________________________________________________________________________

14. How does the current in each branch compare to one another? What does this tell you about the resistance in each bulb?

________________________________________________________________________

15. How does the total current of the circuit relate to the current in each branch?

________________________________________________________________________

16. Measure the voltage across the two batteries: ______________________________ V

17. Measure the voltage across the first light bulb: ____________________________ V

18. Measure the voltage across the second light bulb: __________________________ V

19. Measure the voltage across the third light bulb: ____________________________ V

d. Create a circuit consisting of three light bulbs wired in parallel, connected to two batteries, and draw a schematic diagram

questions continued on next page
20. Measure the current in the first branch: ______________________ A

21. Measure the current in the second branch: ______________________ A

22. Measure the current in the third branch: ______________________ A

23. Measure the total current in the circuit: ______________________ A

24. How does the voltage across each light bulb compare to the voltage across the battery?

________________________________________

25. How does the current in each branch compare to one another? What does this tell you about the resistance in each bulb?

________________________________________

26. How does the total current of the system relate to the current in each branch?

________________________________________

Questions to consider:

1. What happened to the current in the circuit as you added more light bulbs?

________________________________________

2. How did the brightness of the bulbs change as more bulbs are added? What does this indicate to you about the current in each branch?

________________________________________