

In this activity, you will be creating parallel circuits and analyzing the current through and voltage across each resistor and in the circuits as a whole.

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 about branches that are parallel to each other in the circuit?

2. How does the total current in a parallel circuit change when more branches are added?

- b. Create a circuit consisting of one light bulb connected to two batteries, and draw a schematic diagram of your circuit.

Procedure:

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?

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- c. Create a circuit consisting of two light bulbs wired in parallel and connected to two batteries. Draw a schematic diagram of your circuit.

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 do the currents in each branch compare? What do you conclude about the resistance of each bulb?

15. How is the total current in the circuit related to the currents in each branch?

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

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

Name:

Date:

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 do the currents in each branch compare? What do you conclude about the resistance of each bulb?

26. How is the total current in the circuit related to the currents in each branch?

Questions to consider:

1. What happens to the current in a circuit as you add more light bulbs?

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