

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

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, 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?

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

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

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?
