Electricity and Electrical Circuits: Current, Voltage, and Resistance

1. Which of the following best describes electric current?

- [ ] The amount of energy stored in a battery
- [ ] The flow of electric charge through a conductor
- [ ] The force that pushes electrons through a wire
- [ ] The material's opposition to the flow of charge

Quantity	Symbol	Unit of Measurement
Voltage	V	Volts (V)
Current	I	Amperes (A)
Resistance	R	Ohms (Ω)

2. Based on the table above, which unit is used to measure the 'push' or potential difference in a circuit?

> $V = I \times R$

3. A circuit has a resistance of 10 Ω and a current of 2 A. Calculate the voltage.

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4. If a 12V battery is connected to a lightbulb and a current of 3A flows through it, what is the resistance of the bulb?

5. In a series circuit with three lightbulbs, what happens if one bulb burns out?

- [ ] The other two bulbs get brighter
- [ ] The other two bulbs stay lit
- [ ] All bulbs go out
- [ ] The battery explodes

6. What is a primary advantage of a parallel circuit in a home?

- [ ] It uses less wire than a series circuit
- [ ] Devices can be turned off independently without affecting others
- [ ] The total resistance increases as you add more devices
- [ ] It requires only one path for electricity

7. In a series circuit with a 9V battery and three identical bulbs, what is the voltage drop across each individual bulb?

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8. Compare and contrast series and parallel circuits. Explain how the current behaves in each and why houses are wired in parallel.

9. In a circuit diagram, what does a straight line usually represent?

- [ ] A battery
- [ ] A switch
- [ ] A resistor
- [ ] An ideal connecting wire

10. Explain the difference between a conductor and an insulator, and provide one example of each.

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