

CONCEPTUAL PHYSICAL SCIENCE **EXPLORATIONS****Chapter 11 Electricity***Ohm's Law*

- How much current flows in a 1000-ohm resistor when 1.5 volts are impressed across it?

- If the filament resistance in an automobile headlamp is 3 ohms, how many amps does it draw when connected to a 12-volt battery?

- The resistance of the side lights on an automobile are 10 ohms. How much current flows in them when connected to 12 volts?

- What is the current in the 30-ohm heating coil of a coffee maker that operates on a 120-volt circuit?

- During a lie detector test, a voltage of 6 V is impressed across two fingers. When a certain question is asked, the resistance between the fingers drops from 400,000 ohms to 200,000 ohms. What is the current (a) initially through the fingers, and (b) when the resistance between them drops?
(a) _____ (b) _____
- How much resistance allows an impressed voltage of 6 V to produce a current of 0.006 A?

- What is the resistance of a clothes iron that draws a current of 12 A at 120 V?

- What is the voltage across a 100-ohm circuit element that draws a current of 1 A?

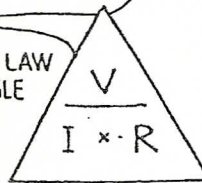
- What voltage will produce 3 A through a 15-ohm resistor?

- The current in an incandescent lamp is 0.5 A when connected to a 120-V circuit, and 0.2 A when connected to a 10-V source. Does the resistance of the lamp change in these cases? Explain your answer and defend it with numerical values.



CURRENT = $\frac{\text{VOLTAGE}}{\text{RESISTANCE}}$ OR $I = \frac{V}{R}$

USE OHM'S LAW IN THE TRIANGLE TO FIND THE QUANTITY YOU WANT, COVER THE LETTER WITH YOUR FINGER AND THE REMAINING TWO SHOW YOU THE FORMULA!



CONDUCTORS AND RESISTORS HAVE RESISTANCE TO THE CURRENT IN THEM.



OHM MY GOODNESS !



Chapter 21

Use with Text Pages 600–607

STUDY GUIDE

● Electric Current

1

In the blank at the left, write the letter of the term that best completes each statement.

- _____ 1. Voltage is a measure of the _____ between two places.
a. resistance potential b. potential difference
- _____ 2. A closed path through which electrons can flow is _____.
a. voltage b. a circuit
- _____ 3. Potential difference is measured in _____.
a. volts b. amperes
- _____ 4. The flow of electrons through a wire or any conductor is called _____.
a. current b. a circuit
- _____ 5. Because it has a potential difference between the positive and negative terminals, a _____ can act as an electron pump.
a. voltmeter b. dry cell
- _____ 6. A car battery is an example of a _____.
a. wet cell b. dry cell
- _____ 7. The tendency for a material to oppose the flow of electrons is called _____.
a. voltage b. resistance
- _____ 8. Resistance is measured in units called _____.
a. volts b. ohms
- _____ 9. Current is measured in _____.
a. volts b. amperes
- _____ 10. The equation $I = V/R$ mathematically expresses _____.
a. Ohm's law b. current law
- _____ 11. The symbol Ω means _____.
a. ohm b. ampere
- _____ 12. In the equation $I = V/R$, I stands for _____.
a. potential difference b. current
- _____ 13. In the equation $I = V/R$, V stands for _____.
a. potential difference b. current
- _____ 14. Thin wires have a _____ resistance to electron flow than do thicker wires.
a. greater b. lesser
- _____ 15. Potential difference is measured with _____.
a. an electroscopes b. a voltmeter