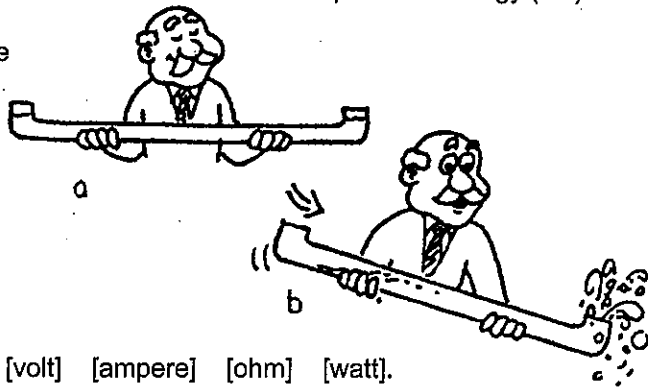


# CONCEPTUAL *Physics* PRACTICE PAGE

## Chapter 23 Electric Current Flow of Charge

1. Water doesn't flow in the pipe when (a) both ends are at the same level. Another way of saying this is that water will not flow in the pipe when both ends have the same potential energy (PE). Similarly, charge will not flow in a conductor if both ends of the conductor are at the same electric potential. But tip the water pipe, and increase the PE of one end so there is a difference in PE across the ends of the pipe, as in (b), and the water will flow. Similarly, charge will flow when you increase the electric potential of an electric conductor so there is a potential difference across the ends.



- The unit of electric potential difference is [volt] [ampere] [ohm] [watt].
- It is common to call electric potential difference [voltage] [amperage] [wattage].
- The flow of electric charge is called electric [voltage] [current] [power] and is measured in [volts] [amperes] [ohms] [watts].

Complete the statements.

- A current of 1 ampere is a flow of charge at the rate of \_\_\_\_\_ coulomb per second.
  - When a charge of 15 C flows through any area in a circuit each second, the current is \_\_\_\_\_ A.
  - One volt is the potential difference between two points if 1 joule of energy is needed to move \_\_\_\_\_ coulomb of charge between the two points.
  - When a lamp is plugged into a 120-V socket, each coulomb of charge that flows in the lamp is raised to a potential energy of \_\_\_\_\_ joules.
  - Which offers more resistance to water flow, a wide pipe or a narrow pipe? \_\_\_\_\_  
Similarly, which offers more resistance to the flow of charge, a thick wire or a thin wire?  
\_\_\_\_\_

A VOLT IS A UNIT OF \_\_\_\_\_  
AND AN AMPERE IS A UNIT OF \_\_\_\_\_

DOES VOLTAGE CAUSE CURRENT,  
OR DOES CURRENT CAUSE VOLTAGE?  
WHICH IS THE CAUSE AND WHICH  
IS THE EFFECT?

Hewitt  
Drewitt!

**Chapter 23 Electric Current**  
**Ohm's Law**

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

\_\_\_\_\_

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

\_\_\_\_\_

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

\_\_\_\_\_

4. What is the current in the 30-ohm heating coil of a coffeemaker that operates on a 120-volt circuit?

\_\_\_\_\_

5. 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.

a. What is the current initially through the fingers? \_\_\_\_\_

b. What is the current through the fingers when the resistance between them drops? \_\_\_\_\_

6. How much resistance allows an impressed voltage of 6 V to produce a current of 0.006 A?

\_\_\_\_\_

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

\_\_\_\_\_

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

\_\_\_\_\_

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

\_\_\_\_\_

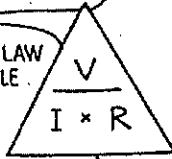
10. The current in an incandescent lamp is 0.5 A when connected to a 120-V circuit, and 0.2 A when connected to a 10-V source. Does the resistance of the lamp change in these cases? Explain your answer and defend it with numerical values.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

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 !



Hewitt  
Drew it!