Science
Ohm's Law Word Problems

Ohm's law says that in an electrical circuit, the current passing through a resistor between two points, is related to the voltage difference between the two points, and inversely related to the electrical resistance between the two points. This relation is shown in the following formula:

$$R = \frac{V}{I}$$

where I is the current in amperes, *V* is the potential difference in volts, and *R* is a constant, measured in ohms, called the resistance.

It also says that current is directly proportional to voltage loss though a resistor. That is if current doubles then so does voltage. To make a current flow through a resistance there must be a voltage across that resistance. Ohm's Law shows the relationship between the voltage (V), current (I) and resistance (R). It can be written in three ways:

$$I = \frac{V}{R} \quad \text{or} \quad V = IR \quad \text{or} \quad R = \frac{V}{I}$$

Directions: For each word problem , write an equation. Show your work and solve the equation.

Example:

If a light bulb uses 2 Amps of current at a voltage of 120 volts, what the resistance value?

$$R = \frac{V}{I}$$
$$R = \frac{120}{2}$$
$$R = 60$$

The resistance value is 60 ohms.

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1) An electric doorbell operates at 12 volts and has a resistance value of 12 ohms. How much current will the doorbell draw?

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Ohm's Law Word Problems continued

2) A small flashlight draws 0.5 Amps at 6 Ohms of resistance. How many volts will the batteries need to supply?

3) We need to construct a circuit to power a red LED lamp. The LED uses 2 volts and draws 1 AMP of current. What value resistor will need to be in the circuit?