

Electric Current, Loads, and Circuits

Key Concepts

- I can describe how moving electrical charges form an electric current.
- I can explain how a load resists the flow of current.
- I can explain why conductors must form a closed loop to allow current to flow.

Current

- charges can flow from a source through conducting materials to an appliance or electrical device, such as a cellphone
- these moving charges are called an electric current
 - the symbol for current is I
 - current is measured in units called amperes (A)
 - ex: $I = 3\text{A}$ means that the current (I) is three amperes (3A)
- smaller unit of electric current is the milliamperere
 - $1\text{A} = 1000\text{ mA}$

Loads

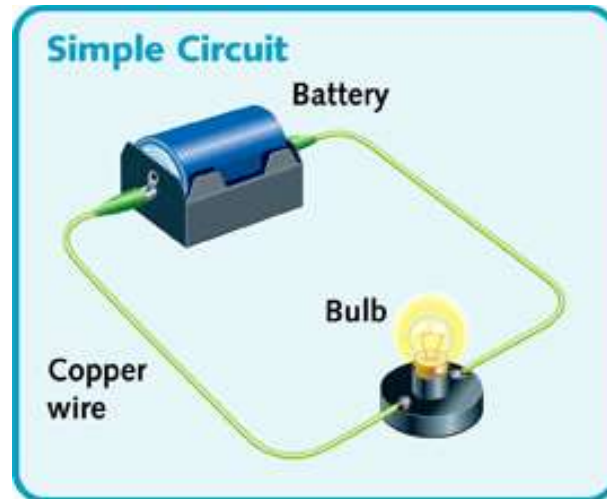
- any device that converts electrical energy into another type of energy is a load
 - a light bulb is a load that transforms electrical energy into light energy
 - a radio is a load that transforms electrical energy into sound energy
- as electrons pass through a load, they lose energy as electrical energy is converted into another type of energy

Resistance

- a load resists, or hinders, the flow of current
- this happens because the electrons in the current collide with the atoms that make up the load or even with each other
- the degree to which the flow of the current is hindered is referred to as resistance
- the symbol for resistance is R
- the unit used to measure resistance is the ohm
- the symbol for an ohm is the Greek letter omega (Ω)

Electrical Circuits

- when a source, load, and conductor are connected in a way that allows current to flow, it is called an electrical circuit
- in order for current to flow, a circuit must form a closed flow



The Flow of Current

- the conductive wire already has electrons in it
 - the negative terminal repels the negative charges in the conductor
 - the positive terminal attracts them
 - as a result, electrons from the cell move into the conductive wire pushing the other electrons ahead of them
 - electrons travel from the negative terminal to the positive terminal
- as the electrons pass through the load they transfer some of their energy to the load, they then leave the load and return to the cell
- electrons enter the cell and combine with positive ions to become neutral
 - over time, there are fewer electrons at the negative terminal and fewer positive ions at the positive terminal
 - the cell dies
- the control of the flow of current can be controlled by a switch

Circuit Diagrams

- simple symbols are used to make it easier to draw circuits
- standard symbols used:

Part of Circuit	Symbol
Electric Cell	
Two-Cell Battery	

Switch	
Light Bulb	
Resistor	
Ammeter	
Voltmeter	
Ohmmeter	

Assignment:

- pg. 227 Q1-9
- Booklet