

Voltage

Current

Complete Circuit

Objectives

Atoms

Describe an atom and its structure.

Define electric charges as it relates to electrons and protons.

Describe the law of electrostatic force.

Voltage

Define voltage and the volt as a unit of voltage.

Define the relationship between voltage and potential difference.

Identify six ways of producing voltage.

Current

Define current and the ampere as a unit of current.

Describe a conductor and the behavior of electrons within a conductor.

Describe an insulator and the behavior of the electrons within an insulator.

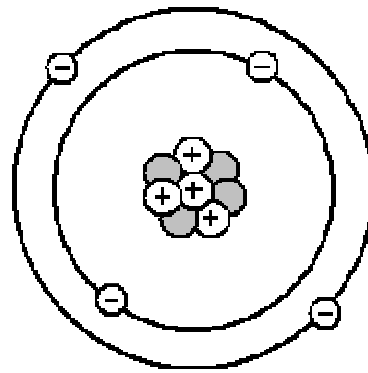
The Electric Circuit

Identify the three basic parts of an electrical circuit.

Describe an electrical circuit load and its relationship to the flow of current.

atom: smallest unit that still retains all of the properties of that unit.

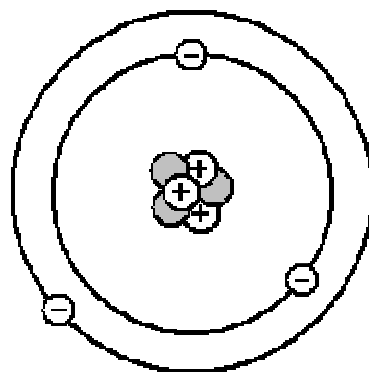
Nucleus: Protons (+), Neutrons (*)
Electrons (-)



Electrostatic Force: the force that exists between the nucleus of an atom and the electrons orbiting around the nucleus. It holds the electrons in orbit around the nucleus.

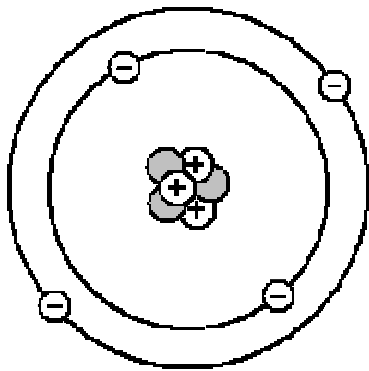
Centrifugal force: spins electrons away from nucleus.

Neutral atom: balanced; same # of electrons and protons.

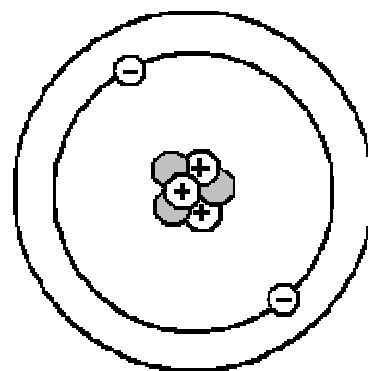


Law of electrostatics: Like charges repel, unlike charges attract.

Negative ion: unbalanced; has more electrons than protons.



Positive ion: unbalanced; has more protons than electrons.



Electrons are attracted to positive ions.

(E or V) Voltage: potential difference, electromotive force.
Unit of Measure: Volts

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Six ways to force electrons out of orbit by overpowering electrostatic force:

friction

pressure

heat

light

chemical action

magnetism

friction - rubbing a silicon rod with fur cloth

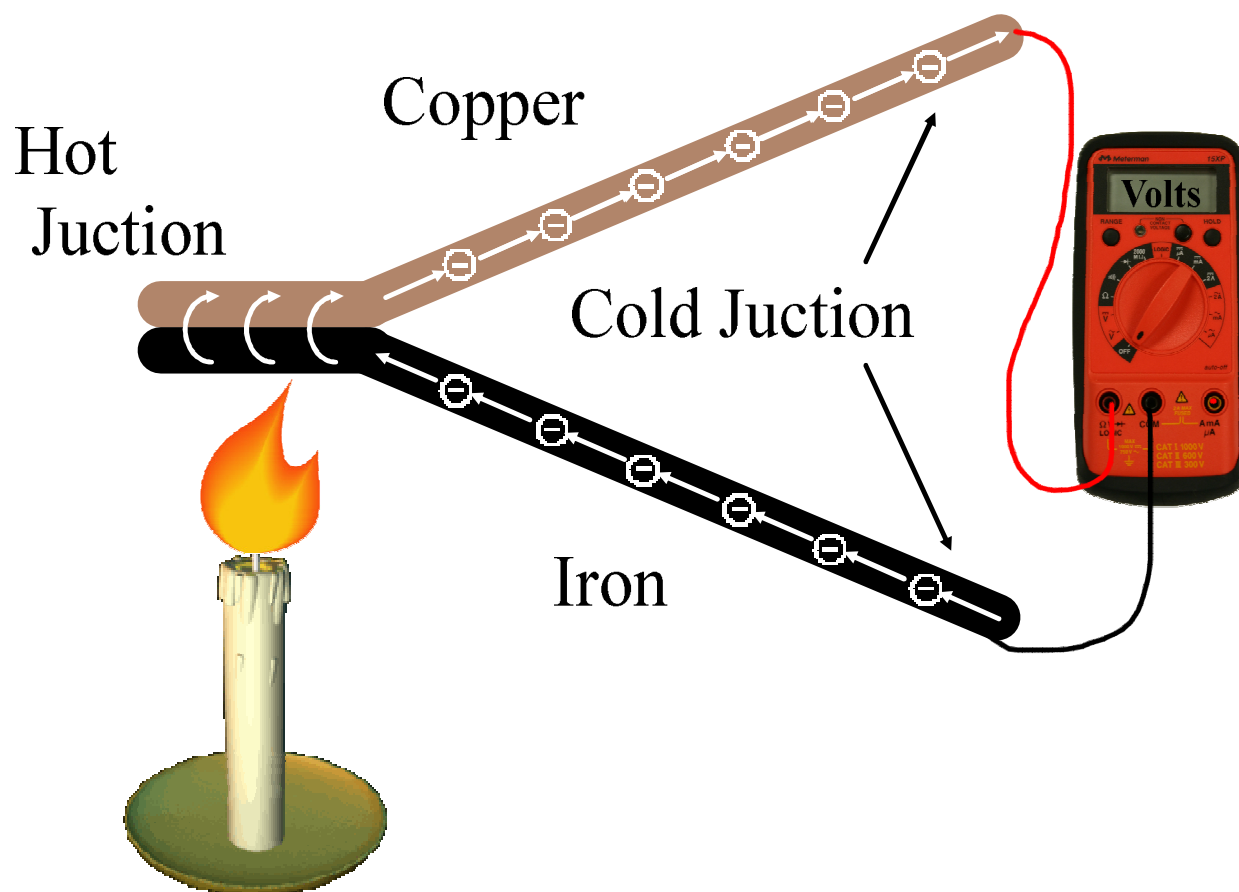
pressure - squeezing a crystal structure; also used in microphones

heat - heating a copper rod and iron rod

light - photocell, silver or copper oxide

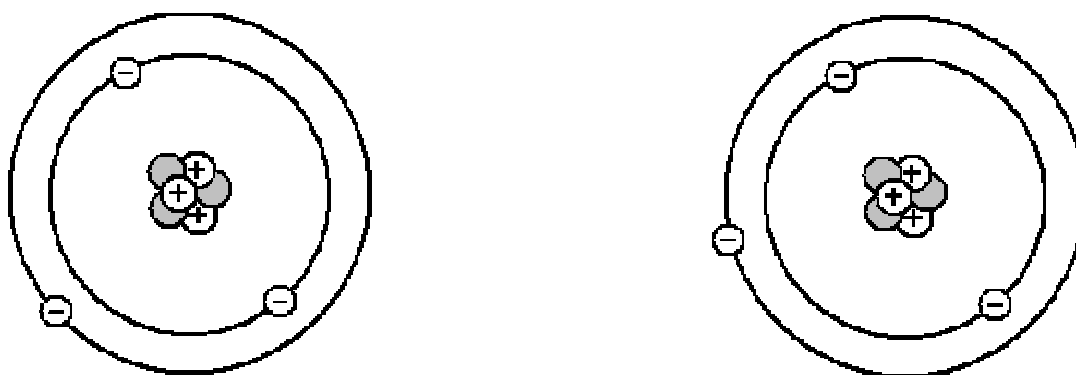
chemical action - battery; zinc, copper, and sulfuric acid

magnetism - electric generator or alternator



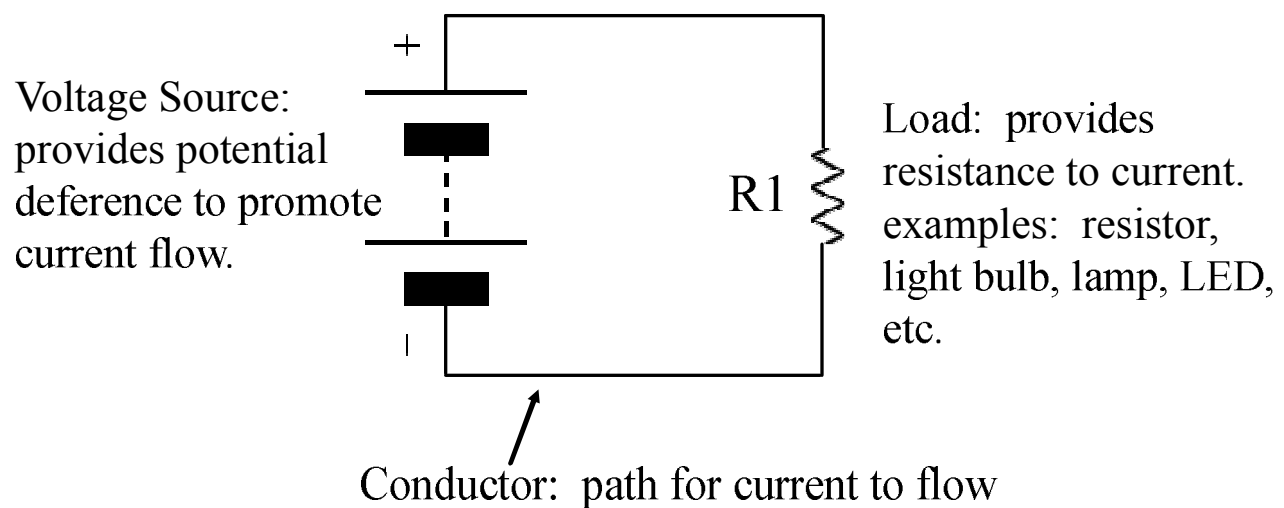
(I) Current: flow of electrons. Unit of Measure: Ampere

Intensity



Ampere: 1 Coulomb per second or 6.25×10^{18} electrons/S

Complete circuit: voltage source, conductor, and load.



Insulator: stops current flow.