

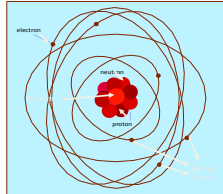


Electricity and Circuits

What is Electricity?

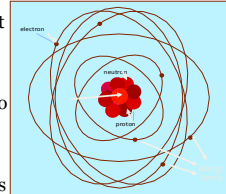
- Electricity is generated from the motion of tiny charged atomic particles called electrons and protons!

- Protons = +
- Electrons = -



What is Electricity?

- Electrons orbit the nucleus of an atom at different distances often referred to as levels.
- Each “energy level” contains a particular number of electrons at its maximum.
- Electrons in different energy levels can jump from one atom to another.
- These jumps change the overall charge of the atoms. The changes result in electricity.



Electric Current

- Electric current is the flow of electric charges.
- Electric current is measured in amperes (A), or amps.
- Electric charges will always flow from a region of higher potential energy to a region of lower potential energy.

Electric Current

- Potential difference is called **voltage** and is measured in units called **volts** (V).
- A battery is a device that converts chemical energy into electricity.
- In batteries the potential energy difference is created by the positive and negative terminals.

Circuits

- A circuit is a path through which electricity can flow.

Circuits

- Energy Source
 - A circuit needs an energy source to push a charge through the circuit
 - A battery is the energy source.

Circuits

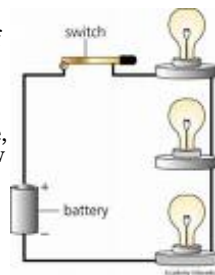
- Conductors
 - A **conductor** is a material that allows electrical energy to flow through it easily.
 - Metals make good conductors, so wires from metals are most often the conductors in circuit.
- Loads
 - A **load** is a device in a circuit that operates using electrical energy.
 - Examples of loads are light bulbs, bells, radios, and motors.

Circuits

- A circuit may also have a **switch**. A **switch** is a device that is used to control the flow of current through a circuit.
- When a switch is open, the path is broken, so no electricity flows through the circuit
 - When a switch is closed, it creates a continuous path through which an electric charge can flow.
- Energy flows only through a circuit that is closed.

Series Circuits

- A **series circuit** is a circuit that provides only one possible path for the flow of current.
- In a series circuit, the loads are set up in a series, or line, that requires current to flow through one load before passing through the next.



Parallel Circuits

- A **parallel circuit** offers more than one path for the flow of electricity.
- Each load in a parallel circuit has its own closed circuit pathway to the energy source.
- Loads in a parallel circuit use the full voltage of the energy source.

