

CLASS NOTES---

Atom

An atom is the smallest particle characterizing an element. All matter in the universe is made up of a combination of different atoms. Atoms are made up of protons, neutrons and electrons.

Electrical charge

An electrical charge is produced when an atom loses or gains an electron. When there are more electrons than protons, the charge is negative. When there are fewer electrons than protons, the charge is positive. The unit of electrical charge is the coulomb (symbol: C).

Electrical current

An electrical current is the movement of negative electrical charges (electrons) through a conductor (electrical wire, metal foil, etc.). In an electrical circuit, the current flows from the point where the electrical potential is highest to the point where it is lowest.

Electrical circuit

An electrical circuit is the complete loop through which an electrical current flows. It is made up of a series of electrical components and conductors (e.g., batteries, electrical wires, light bulbs, etc.). The current only flows in an electrical circuit when the path is completely closed, forming a loop.

Types of electrical circuit

There are two types of electrical circuit, parallel circuits and series circuits. Parallel circuits provide several different paths for the electrical current. Series circuits force the current through a single path; in other words, the electricity flows through all the electrical components of a series circuit one after the other.

Conductors of electricity

Conductors are bodies or materials that allow an electrical current to pass through them. Copper, aluminum, brass, zinc, iron and pewter are examples of metal that conduct electricity well. Salt water is also a good conductor.

Resistance

Resistance is the part of an electrical circuit that resists the flow of electricity (for example, by transforming it into heat or light, as in a light bulb or a buzzer). In an electrical circuit, the presence of a resistor limits the current and prevents damage related to short circuits. The unit used to measure resistance is the ohm (symbol: Ω).

Ampere

The ampere (symbol: A) is the unit used to measure current intensity.

Voltage

Voltage (symbol: V) is the unit used to measure electrical tension, also called “difference of electrical potential.”

Short circuit

A short circuit occurs when two live (i.e., carrying current) conductors accidentally come into contact, either directly or through a conducting object (e.g., when the blade of an electric lawn mower cuts the electrical wire). When this happens, the current can flow with very little restriction because the resistance of the loop formed by the two conductors is very weak. The high amount of current heats up the wires and can cause a fire. Fuses and circuit breakers detect unusually high currents and break the circuit, which helps to prevent fires.

Battery

Batteries are reserves of chemical energy that can be transformed into electrical energy. Small electric cells (commonly called batteries, as in AA batteries) are examples of simple batteries for everyday use.

Insulator

Insulators, such as wood and plastic, are materials that do not easily transmit heat, cold or electricity. Electrical wires are covered with an insulator to prevent electrical shocks and short circuits that could cause fires.

People

Thomas Alva Edison (1847-1931), a U.S. inventor who designed the first electric light bulb. He also invented many other devices, including the phonograph, ancestor of the gramophone.

Alessandro Volta (1745-1827), an Italian physicist, invented the first electric battery.