

Physics Unit Review

Static Electricity:

Static charges accumulate on surfaces and **remain there** until given a path to escape

Electrostatics – the study of electric charges

- Within an atom, there are three types of smaller particles:
 - **Protons** have a positive electric charge (+)
 - **Electrons have a negative electric charge (-).**
 - **Neutrons** have no electric charge, they are neutral.

Charging materials

1. By friction – Each material becomes charged
 - **Electron Affinity**
 - Materials that hold on to their electrons become negatively charged.
 - Materials that lose their electrons become positively charged.
2. By Conduction – the neutral object receives the same charge
3. By Induction – The neutral object receives the opposite charge.

Law of attraction and law of repulsion

- Like charges repel
- Opposite charges attract
- Charged objects attract neutral objects

Insulators and Conductors

- Insulators resist or block the flow of electrons (Rubber, wood, plastic)
- Conductors allow the flow of electrons (Metal)

Current Electricity:

Current electricity is the continuous flow of electrons in a closed circuit.

Parts of an electric circuit

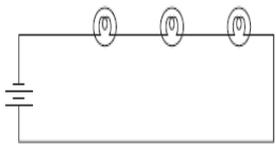
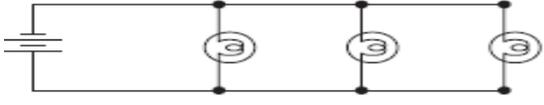
1. Energy source
2. Conductor
3. Load
4. Switch

Types of current electricity

Direct Current (DC)	Alternating Current (AC)
Electrons flow from the negative terminal to the positive terminal	Electrons move back and forth, alternating their direction several times every second.

Current (Amps) - Electric current (I) is a measure of the amount of electric charge that passes by a point in an electric circuit each second.	Voltage (Volts) - Potential difference or voltage (V) is the difference in electric potential energy between two points in a circuit.	Resistance (ohms) - Resistance (R) is the degree to which a substance opposes the flow of electric current through it.
Measured with an ammeter	Measured with a voltmeter	Measured with an ohmmeter
Measured in series	Measured in parallel	Measured in parallel
Series Circuits $I_{\text{total}} = I_1 = I_2 = I_3$	Series Circuits $V_T = V_1 + V_2 + V_3$	

Parallel Circuits $I_{\text{total}} = I_1 + I_2 + I_3$	Parallel Circuits $V_T = V_1 = V_2 = V_3$	
--	---	--

<p>Series circuit</p> <ul style="list-style-type: none"> - Only has one path for electricity to follow 	<p>Parallel Circuits</p> <ul style="list-style-type: none"> - Has multiple pathways for electricity to follow 
---	---

Electricity sources and consumption: We can reduce our electrical energy consumption and use renewable energy resources.

Energy = the Ability to do work

$$\text{Energy} = \text{Power} \times \text{Time}$$

kWh kW h

Energy Sources

1. Non-renewable resources.
 - A resource that cannot be replaced once it is used up.
2. Renewable resources.
 - A resource that can be reused or replaced.