





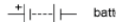









Static Electricity (Triple only)
 Examples: Hair standing up after taking a jumper off, rubbing a balloon on your hair.

Static electricity is a build up of **negative charges (electrons)** which are then released. An object is charged if electrons are added or removed.

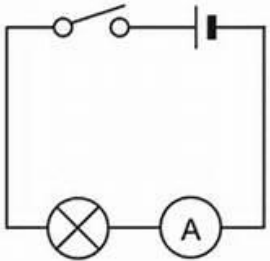
Circuit Symbols

	switch (open)		lamp
	switch (closed)		fuse
	cell		voltmeter
	battery		ammeter
	diode		thermistors
	resistor		LDR
	variable resistor		LED

Current
 Current is the flow of charge (electrons) around a circuit.

- * It is measured in **Amps (A)**
- * It is measured using an **Ammeter**
- * In a **series** circuit the current is the **same** everywhere.
- * In a **parallel** circuit the current **splits** at each branch. The current through the cell is **equal** to the current through all the branches added together.

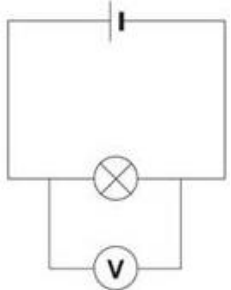
The ammeter must be placed in the circuit to take a reading.



Potential Difference (Voltage)
 Potential Difference is the amount of **energy** transferred to a component by each unit of **charge**.

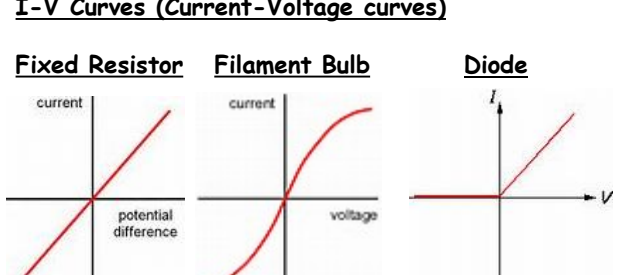
- * It is measured in **Volts (V)**
- * It is measured using a **Voltmeter**
- * In a **series** circuit the PD of the cell is shared between all the components. The component with the highest **resistance** receives the most PD.
- * In a **parallel** circuit each branch receives the **same** PD as the cell.

The voltmeter must be placed in parallel with a component in order to measure the PD across it.



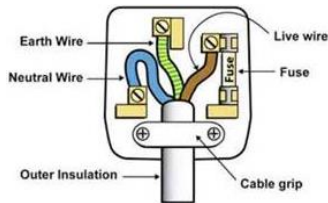
Resistance
 Resistance is the measure of how hard it is for current to pass through a component.

- * It is measured in Ohms (Ω)
- * It is calculated using $R=V/I$
- * If you add resistors in **series** the resistance **increases**, if you add resistance in **parallel** the resistance **decreases**.



Electrical Safety

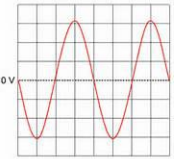
The plug and wires are coated in plastic which doesn't conduct electricity.



Safety Devices
 * **Earth Wire** - Only needed for devices with a **metal casing**. Provides a safe route for the current if the live wire touches the casing.

AC & DC

* **Alternating Current (AC)** the current changes direction. UK mains supply is **230V** and **50Hz**.



* **Direct Current (DC)** flows in the same direction. DC comes from a **battery** or from a **AC supply** which has passed through a **diode**.

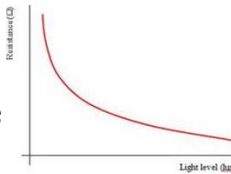
* The trace works like a graph, with time on the x-axis and voltage on the y-axis.

* **Fixed Resistor** - Straight line shows it is a constant resistance. The steeper the line the lower the resistance.

* **Filament Bulb** - Resistance **increases** as the bulb heats up and **ions vibrate** more.

* **Diode** - Only allows current to flow in **one direction**.

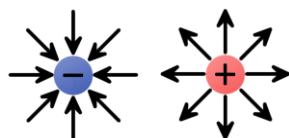
Thermistors and LDR's
 They have the same shaped graph



* **LDR's** - Street lighting, cameras

* **Thermistors** - Ovens, fridges, central heating

Electrical fields (Triple only)
 Field lines travel away from the positive and towards the negative.



The closer you are to the charge, the stronger the electrical field