

Definitions and Concepts for WJEC (Eduqas) Physics GCSE

Topic 7: Electricity

*Definitions in **bold** are for higher tier only*

Definitions marked by '' are for separate sciences only*

Alternating Voltage: A continually oscillating current flow, which results in the potential difference across two points continually oscillating between a positive and negative value.

Ammeter: A device connected in series with a component to measure the current that flows through it.

Amperes (Amps): The unit of current.

Charge: A property of all matter. Charges can be positive or negative.

Coulomb: The unit of charge.

Diode: A component that only allows current to flow through in the forward direction. They have very large resistances in the reverse direction.

Direct Current: Current flow consisting of charges flowing in a single direction only. Batteries and cells provide direct current.

Direct Voltage: A one-directional current flow, which results in a fixed voltage polarity.

Earthing: The removal of excess charge by providing a low resistance path for electrons to flow through.

Earth Wire: The green and yellow striped safety wire connected to metal casings, that prevents an appliance from becoming live.

Electric Current: The rate of flow of electrical charge. Its value is the same at any position in a single closed loop. In metals, the charges that flow are electrons.

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Electric Field Lines: Lines representing an electric field, that point in the direction in which a positive charge would experience an electric force. The closer they are, the stronger the field.

Electric Field: A region in which a charge will experience a non-contact, electric force. All charged objects have an electric field around them, and this field is stronger the closer you are to the charge.

Filament Lamp: A light emitting component consisting of an enclosed metal filament. Its resistance increases as the filament's temperature increases.

Fuse: A safety device consisting of a thin metal filament that melts and cuts off the power supply if there is a surge in current. Fuses are connected to the live wire.

Light Dependent Resistor (LDR): A light sensitive component whose resistance decreases as its temperature increases.

Light Emitting Diode: A device that gives out light when a current flows through it. Current can only flow through it in one direction, and a minimum voltage must be applied across it before it illuminates.

Lightning: A consequence of static charge building up in the clouds. Lightning strikes are caused by the discharge of this charge.

Like Charges: When two charges of the same polarity meet, they will repel.

Live Wire: The brown coloured wire that carries the alternating current from the supply in a mains power supply.

Mains Electricity: An a.c supply, which in the UK has a frequency of 50Hz a value of 230V.

Neutral Wire: The blue coloured wire that completes the circuit in a mains power supply.

Ohmic Conductor: A conductor whose current flow is directly proportional to the potential difference across it, when held at a constant temperature.

Ohms: The unit of resistance.

Ohm's Law: The current flowing through an Ohmic conductor at constant temperature is directly proportional to the potential difference across it.

Parallel Plates: The electric field between two charged plates is uniform. The field lines are parallel, equally spaced and point from the positive plate to the negative plate.



Parallel: Components connected in parallel have the same potential difference across each component. The total current is equal to the sum of the currents flowing through each component.

Point Charge: The electric field around a point charge becomes weaker the further away you are. The field lines for a positive charge point radially outwards, whereas the field lines for a negative charge point radially inwards.

Potential Difference: The energy that is transferred per unit charge between two points in a circuit. It is often also called a voltage. A potential difference is required for current to flow.

Power: The rate at which an appliance transfers energy. For a circuit component, it is equal to the product of the current passing through it and the potential difference across it.

Resistors in Parallel: The total resistance is less than the lowest individual resistance. **It is equal to the inverse of the sum of the inverses of the individual resistances.**

Resistors in Series: The total resistance is equal to the sum of the resistances of the individual resistors.

Series: Components connected in series have the same current passing through each component but share the total potential difference of the power supply.

Sparking: The transfer of electrons between two surfaces that have an imbalance of charges. Sparking can be particularly dangerous in locations such as petrol pumps, and so the pumps must be earthed.

Static Charge: The charge caused by an imbalance of positive and negative charges in, or on, an object's surface. It is often caused by electrons being rubbed from one surface onto another.

Thermistor: A temperature dependent component, whose resistance increases as its temperature decreases.

Unlike Charges: When two charges of opposite polarities meet, they will attract.

Volt: The unit of potential difference. One volt is equal to one joule per coulomb.

Voltmeter: A device that is connected in parallel with a component to measure the potential difference across it.

Watt: The unit of power.

