

Definitions and Concepts for Edexcel Physics IGCSE

Topic 6: Magnetism and Electromagnetism

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

Definitions marked by '' are for separate sciences only*

Current-Carrying Wires: When current flows through a wire, a magnetic field is generated around it. The strength of the field depends on the magnitude of the current and the distance from the wire.

Electric Motor: A current-carrying coil of wire in a magnetic field. The two sides of the coil that are perpendicular to the magnetic field experience forces in opposite directions, causing rotation.

***Electromagnet:** A solenoid with an iron core. The magnetism of an electromagnet can be switched on and off, and the strength changed, through varying the current in the solenoid.

Fleming's Left-Hand Rule: A rule used to determine the orientation of the force (thumb), current (second finger) and magnetic field (first finger) when a current-carrying wire is placed in a magnetic field (motor effect).

Generator Effect: When there is relative motion between an electrical conductor and a magnetic field, a voltage will be induced across the ends of the conductor. A current will flow if this conductor is part of a complete circuit.

Induced Magnet: A material that becomes a magnet when it is placed in an existing magnetic field, but loses its magnetism quickly once it is removed. Induced magnetism always produces attractive forces.

Like Magnetic Poles: When matching poles of a magnet are brought near each other they repel each other.

Loudspeaker: A device that converts variations in current into vibrations of a diaphragm to produce corresponding sound waves.

Magnetic Field Lines: Lines that show the strength and direction of a magnetic field. The lines point from North to South and their concentration represents the magnitude of the field.

Magnetic Field: The region around a magnet in which another magnet or magnetic material

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will experience a non-contact force.

Magnetic Materials: Iron, steel, cobalt and nickel.

Magnetic Poles: The regions of a magnet where the magnetic forces are at their strongest.

Magnetically Hard: A material property that means the material can be permanently magnetised. Examples include iron and alloys containing large amounts of iron.

Magnetically Soft: A material property that means the material can be temporarily magnetised. Examples include alloys with lower amounts of iron.

Permanent Magnet: A magnet that produces its own magnetic field.

***Power Cables:** Metal wires that are part of the National Grid. Electricity is transported along them at very high voltages to reduce the energy loss and make the transportation more efficient.

***Solenoid:** A wire wrapped into the shape of a coil, that has a strong and uniform magnetic field inside of it. The solenoid's magnetic field strength can be increased by adding an iron core.

***Step-Down Transformer:** A transformer that has a smaller potential difference in the secondary coil than in the primary coil. This is a result of the secondary coil having fewer turns.

***Step-Up Transformer:** A transformer that has a larger potential difference in the secondary coil than in the primary coil. This is a result of the secondary coil having more turns.

***Transformer:** An iron core with a primary and secondary coil of wire wound around opposite ends. Transformers can change the magnitude of an alternating voltage.

***Turns Ratio:** The number of turns in the primary coil of a transformer over the number of turns in the secondary coil. This is equal to the voltage ratio for a 100% efficient transformer.

Unlike Magnetic Poles: When opposite poles of a magnet are brought near each other they attract each other.

***Voltage Ratio:** The voltage across the primary coil of a transformer over the voltage across the secondary coil.

