

## Definitions and Concepts for Edexcel Physics IGCSE

### Topic 6: Magnetism and Electromagnetism

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*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.

