Foxford Learning Plan

KS4

Physics

Magnetism and Electromagnetism

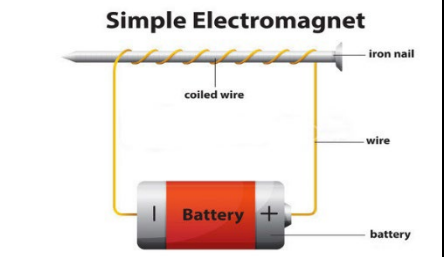
Key Vocabulary

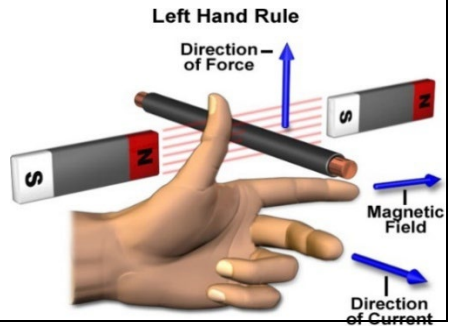
Alternator	A device that makes use of the generator effect to generate alternating current.
Attraction	Opposite poles will experience a force of attraction, meaning they will experience a force towards each other. The force between a magnet and magnetic material is always one of attraction.
Current carrying wire	When current flows through a wire, a magnetic field is generated around it. The strength of the field is dependent on the magnitude of the current and the distance from the wire.
Dynamo	A device that makes use of the generator effect to generate direct current.
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.
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 potential difference 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
Magnetic field	The region around a magnet in which another magnet or magnetic material will experience a force
Magnetic materials	Iron, steel, cobalt and nickel
Magnetic poles	The regions of a magnet where the magnetic forces are at their strongest
Microphone	A device that uses the generator effect to convert the pressure variations of sound waves into variations in the electrical current of a circuit.
Motor effect	When a current-carrying wire is placed in a magnetic field, a force will be experienced between the wire and the magnet responsible for the field
Permanent magnet	A magnet that produces its own magnetic field. Repulsion: Like-poles will experience a force of repulsion, meaning they will experience forces in opposite directions
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.
Transformer	An iron core with a primary and secondary coil of wire wound around opposite ends
Tesla	The unit of magnetic flux density

Key Skills

Over the course of the topic, I will be able to: -

- Be able to draw magnetic field lines.
- Practical – be able to investigate and map out magnetic field lines using different methods
- Practical – Be able to investigate electromagnets, motor and generator effects.
- Be able to explain using models and diagrams how generators work.
- Numeracy – Be able to calculate the changing voltage when given information about different transformers.





I will Understand

- What an electromagnet is and how it works.
- What is meant by the generator and motor effect and how they are useful.
- How to use Fleming's left-hand rule can be used to identify different quantities.
- How transformers work and why they are important for the national grid.