

P6 Magnets and Generating Electricity

Poles	Magnets have a North (seeking) and a South (seeking) pole.
Magnetic field	The shape of the magnetic field around a bar magnet is observed as a series of field lines which curve outwards from one pole, returning at the opposite pole; achieved by using iron filings or a plotting compass.
	Magnetic field lines are drawn as curved line with arrows leading away from the North (seeking) pole and in at the South (seeking) pole.
Attraction and repulsion	Like poles repel each other and opposite poles attract each other.
Earths field	The Earth also as a magnetic field with a similar field pattern to a bar magnet.
Compass	A compass is a small mobile magnet that has poles which are attracted to the Earth's own magnetic poles. The North (seeking) pole is attracted to (seeks) the Earth's North pole. The South (seeking) pole does the reverse.
Electromagnet	When current flows a magnetic field is produced at right angles to that current; the wire acts as an electromagnet. The field lines are arranged concentrically around the wire in a clockwise direction if the current flow is away from the observer.
	Coiling current carrying wires and wrapping them around ferromagnetic materials such as iron, can increase the strength of electromagnets.
Motor effect	Electromagnets can interact with permanent magnets to produce movement such as is observed in electric motors, door bells, and relay switches.
Turbines and generators	Turbines are turned using kinetic energy and turn a magnet in a coil generating a current.
Stores of energy	Chemical energy is a store of energy found in foods and fuels. Kinetic energy is the store for anything that is moving.
Joule	The unit for energy
kCal	The unit for energy in food
Fossil fuels	Coal, oil and natural gas
Non- renewable energy	Finite resources that can't be quickly reformed. Examples are fossil fuels and nuclear
Renewable energy	Resources that don't run out or can be reformed. Solar, wind, biomass, hydroelectric, geothermal, tidal and wave
Polluting	These resources produce gasses that are harmful or polluting to environment. Biofuels and fossil fuels.
Sun	All forms of electrical generation ultimately get their energy from the sun. Except geothermal which uses the earths heat?
Power stations	Electrical energy is generated in these
Power	Energy ÷ time measured in Watts

Mains electricity	measured in kWh
Cost of electricity	Power(kW) X time (h) X cost (pence)

Key physics points:

A force can cause a change in shape or a change in motion and is measured in Newton's

A wave transfers energy without a net change in particles

Electrical current is the flow of electrons and measured in Amps

The amount of energy transferred between two points in an electrical circuit is potential difference and is measured in Volts.

Resistance is anything that opposes the flow of current and is measured in ohms.

Force and energy are related by the work done equation: work done (J)= force (N) x distance (m)