



GCSE Physics **Glossary**

Combined Science

absorb	To receive or take in.
acceleration	The change in velocity of an object over time.
activity	The rate at which a source of unstable nuclei decays, measured in becquerel (Bq).
air resistance	A force that acts in the opposite direction to an object's movement as it travels through the air.
alpha particle (α)	A particle consisting of two neutrons and two protons. It is the same as a helium nucleus. The emission of this particle causes both the mass and the charge of a nucleus to decrease.
alpha particle scattering experiment	The experiment that suggested that the mass of an atom was concentrated in the centre (nucleus) and that the nucleus was charged. The experiment led to the nuclear model of the atom, which replaced the plum pudding model.
alternating current (ac)	Electric current in a circuit that repeatedly changes direction.
alternator (HT only)	A device that uses the generator effect to generate alternating current.
ammeter	A component used to measure electric current in a circuit.
amplitude	The maximum displacement of a point on a wave away from its undisturbed position.
atmosphere	The layer of gases that surrounds the Earth.
atmospheric pressure	The pressure created by air molecules colliding with the surface of the Earth.
atom	The smallest part of an element that can exist.
atomic number	The number of protons in an atom of an element.
attraction	A force that causes objects to move towards each other.
bar magnet	A permanent magnet in the shape of a bar with a magnetic pole at each end.
battery	Two or more cells connected together in series.
beta particle (β)	A high-speed electron ejected from the nucleus as a neutron turns into a proton. The emission of this particle does not cause the mass of the nucleus to change but does cause the charge of the nucleus to increase.

biofuel	Any fuel taken from living or recently living organisms.
boiling	The process that happens at the boiling point of a substance when the rate of evaporation is at its maximum.
boiling point	The temperature at which a substance changes from liquid to gas (evaporates). It is also the temperature at which a substance changes from gas to liquid (condenses).
boundary	The point at which two materials meet.
braking distance	The distance a vehicle travels under the braking force.
cancer	A disease caused by changes in cells that lead to uncontrolled growth and division.
carbon-neutral	When a process does not result in a net contribution of carbon dioxide to the atmosphere, for example the burning of biofuels.
centre of mass	The single point at which the weight of an object is considered to act.
change of state	A physical change from one state of matter to another.
charge	A property of a particle that causes it to experience a force in an electric field.
chemical cell	A source of chemical energy that can be transferred as electric current in a circuit.
chemical change	A change in which one or more new substances are produced.
chemical energy store	The energy stored in chemical bonds.
circuit diagram	A diagram that uses circuit symbols to show how the components in a circuit are connected.
closed system	An object or group of objects in which the total amount of energy is constant.
component	A part of a larger whole.
component forces (HT only)	A single resultant force can be resolved into these two perpendicular forces.
compressed	Pressed or squeezed together.
compression (longitudinal waves)	A region of high pressure due to particles being close together.
condensation	A change of state from gas to liquid.

conduction	The transfer of heat or electricity through a material.
conductor	A material that allows electrons to move freely inside it. This means that electrical charge and thermal energy can pass through it easily.
conservation of energy	Energy cannot be created or destroyed.
conservation of mass	No atoms are lost or made during a chemical reaction so the mass of the products equals the mass of the reactants.
conservation of momentum	In a closed system, the total momentum before an event is equal to the total momentum after the event.
contact force	A force that acts between objects that are physically touching.
count-rate	The number of decays recorded each second by a detector such as a Geiger-Muller tube.
current	The flow of electrical charge, measured in amps (A). Represented in an equation by the letter I.
deceleration	The decrease in velocity of an object over time.
deformation	The change in shape or size of an object due to forces being applied.
density	The mass per unit volume of a substance, measured in kilograms per metre cubed (kg/m^3). It is calculated by dividing the mass of an object by its volume.
diode	A non-ohmic conductor that allows current to flow in one direction only. It has a very high resistance in the reverse direction.
direct current (dc)	Electric current in a circuit that flows in one direction only.
direct proportion	A relationship between two variables where one value increases at the same rate as the other increases.
displacement	A vector quantity including the distance an object moves, measured in a straight line from the start point to the finish point, and the direction of that straight line.
dissipated	Energy that is not transferred usefully and is lost from a system (to the surroundings). Often described as wasted energy.
distance	How far an object moves, or the length between two points, measured in metres (m). It is a scalar quantity.
distance-time graph	A graph showing how the distance travelled by an object changes over time.
dynamo (HT only)	A device that uses the generator effect to generate direct current.
earth wire	The wire in a mains cable that provides a path for electric current to flow from the case of the appliance to the ground if there is a fault. It is coloured with green and yellow stripes.

economic	Relating to trade, industry and money.
efficiency	Useful energy transferred by a device divided by the total energy supplied to the device, or useful power output divided by total power input.
elastic deformation	This occurs when an object changes shape when forces are applied, then returns to its original shape when the forces are removed.
elastic potential energy store	The energy stored when an object has been stretched or compressed.
elasticity	The ability of a material to return to its original shape after being stretched or compressed.
electric motor (HT only)	A device with a coil of wire carrying a current that rotates in a magnetic field.
electrical charge	A property of a particle that causes it to experience a force in an electric field, measured in coulombs (C).
electrical work	Energy transferred electrically when a charge is moved through a potential difference.
electromagnet	A solenoid with an iron core.
electromagnetic spectrum	The continuous spectrum of electromagnetic waves. From long to short wavelength the groups are: radio, microwave, infrared, visible light, ultraviolet, X-rays and gamma rays.
electromagnetic waves	Transverse waves that transfer energy from the source of the waves to an absorber. These waves form a continuous spectrum and travel at the same velocity through a vacuum or air.
electromagnetism	A force that exists between electrically charged particles.
electron	A particle with a relative charge of -1 and a very small relative mass. It orbits the nucleus of an atom or ion in energy levels (shells).
electronic structure	The number of electrons in each energy level (shell) of an atom, e.g. a sodium atom has an electronic structure of 2, 8, 1.
electrostatic energy store	The energy stored when repelling charges have been pushed closer together or when attracting charges have been pulled further apart.
electrostatic force	A force of attraction between oppositely charged particles.
element	A substance made of only one type of atom.
emit	To release or give out.
energy level	The distance from the nucleus of an atom where electrons orbit. Also called a shell.



energy store	A way that energy is stored in or by objects due to their motion, position, shape or processes.
energy transfer	The movement of energy from one store to another.
equilibrium	A stable situation reached when the forces acting on an object are balanced.
ethical	Relating to morals, right and wrong.
evaporation	A change of state from liquid to gas.
evidence	The available information or facts that either support or counter a scientific theory or hypothesis.
expand	Increase in size.
extension	The increase in length of a material when stretched, measured in metres (m).
filament lamp	A component that contains a thin coil of wire that heats up and therefore produces light when an electric current passes through it.
Fleming's left-hand rule (HT only)	A model of the motor effect that represents the relative orientation of the force, the current in the conductor and the magnetic field.
fluid	A substance that has no fixed shape and can flow. It can be either a liquid or a gas.
force	A push or pull that acts on an object due to the interaction with another object.
fossil fuel	A fuel formed over millions of years from the remains of dead plants and animals. Examples are coal, oil and natural gas.
free body diagram	A diagram showing the forces acting on an object. The object is usually shown as a box or a dot.
freezing	A change of state from liquid to solid.
frequency	The number of waves passing a point each second.
friction	A force that resists the movement of two surfaces that are sliding (or trying to slide) across each other.
fuse	A component containing a thin wire that melts if too much current passes through it. It is used as a safety device in a circuit.
gamma ray (γ)	Ionising electromagnetic radiation emitted from the nucleus of an atom that can cause the mutation of genes and cancer. The emission of this radiation does not cause the mass or the charge of the nucleus to change.

gas	The state of matter in which a substance can flow and completely fill a container. It has no fixed shape or volume and can be compressed. The particles are far apart and move quickly in all directions.
Geiger-Muller tube	An instrument used to detect ionising radiation.
generator effect (HT only)	The effect produced when an electrical conductor moves relative to a magnetic field or there is a change in the magnetic field around a conductor. A potential difference is induced across the ends of the conductor. If the conductor is part of a complete circuit, a current is induced in the conductor.
geothermal energy	Energy harnessed from hot rocks beneath the Earth's surface.
gradient	The steepness of a line (on a graph).
gravitational field	The area around an object where another object experiences a gravitational force.
gravitational field strength	The gravitational force exerted per unit mass, measured in newtons per kilogram (N/kg).
gravitational force (gravity)	A force of attraction that pulls all things with mass or energy toward one another.
gravitational potential energy store	The energy store of an object lifted in a gravitational field.
half-life	The time it takes for the number of nuclei of the isotope in a sample to halve, or the time it takes for the count rate (or activity) from a sample containing the isotope to fall to half its initial level.
heating	Energy transferred by conduction or convection as a result of a temperature difference between two objects.
height	Vertical distance, measured in metres (m).
Hooke's law	The extension of an elastic object is directly proportional to the force applied, provided that the limit of proportionality is not exceeded.
hydroelectricity	Electricity generated by harnessing energy from falling water.
induced magnet	A material that becomes a magnet when it is placed in a magnetic field.
inelastic deformation	This occurs when an object is stretched beyond its elastic limit and no longer returns to its original shape when the forces acting on it are removed.
inertia (HT only)	The tendency of objects to continue in their state of rest or of uniform motion.
inertial mass (HT only)	A measure of how difficult it is to change the velocity of an object. The ratio of force over acceleration.

infrared radiation	Part of the electromagnetic spectrum found between visible light and microwaves. This type of radiation is emitted and absorbed by all objects.
insulator	A material that does not allow energy to transfer through it easily.
internal energy store	The total kinetic energy and potential energy of all the particles (atoms and molecules) that make up a system. Sometimes referred to as thermal energy.
inverse proportion	A relationship between two variables where one value increases as the other decreases.
ion	A charged particle formed when an atom or molecule loses or gains one or more electrons.
ionisation	The process by which atoms or molecules become charged due to the loss or gain of one or more electrons.
iron core	A material placed inside a solenoid to increase the strength of the magnetic field.
irradiation	The process of exposing an object to nuclear radiation.
isotopes	Atoms of the same element with different numbers of neutrons.
James Chadwick	The scientist who provided experimental evidence to show the existence of neutrons within the nucleus of an atom.
kinetic energy store	The energy store of a moving object.
lamp	A component that emits light in a circuit. Also called a bulb.
latent heat	The energy needed for a substance to change state, with no change in temperature.
light-dependent resistor (LDR)	A resistor that causes the resistance of a circuit to decrease as the light intensity increases.
light-emitting diode (LED)	A diode that emits light when a current passes through it in one direction.
limit of proportionality	The point beyond which Hooke's law is no longer true when stretching a material.
liquid	The state of matter in which a substance can flow and take the shape of a container. It has a fixed volume and cannot be compressed. The particles can move around each other.
live wire	The mains wire that carries the alternating potential difference from the supply. It is coloured brown for easy identification.
longitudinal wave	A wave with oscillations parallel to the direction of energy transfer, e.g. sound waves.
lubricant	A substance that reduces the effects of friction by helping two surfaces move past each other more easily.

magnetic compass	A device which contains a magnetised needle that rotates on a pivot. The needle points in the direction of a magnetic field.
magnetic energy store	The energy stored when repelling poles have been pushed closer together or when attracting poles have been pulled further apart.
magnetic field	The area around a magnet, electric current or moving charged particle where there is a magnetic force.
magnetic field pattern	A diagram that shows the direction and shape of a magnetic field.
magnetic force	The force exerted on a magnetic material by a magnetic field.
magnetic material	A material that can be attracted by a magnet or made into a magnet. Examples are iron, steel, cobalt and nickel.
magnetise	To turn into a magnet.
magnetism	A force of attraction or repulsion due to the magnetic field around a magnet.
magnification	The ratio of the image height to the object height.
magnitude	The size or extent of something.
mains electricity	The electrical supply found in homes and businesses. It is an ac supply, with a frequency of 50Hz and 230V in the UK.
mass	The amount of matter in an object, measured in kilograms (kg).
mass number	The total number of protons and neutrons in the nucleus of an atom.
material interface	The boundary between two materials.
mechanical work	Energy transferred mechanically by a force making something move.
medium	A substance or material that carries a wave.
melting	A change of state from solid to liquid.
melting point	The temperature at which a substance changes from solid to liquid (melts). It is also the temperature at which a substance changes from liquid to solid (freezes).
microphone (HT only)	See moving-coil microphone.
microwaves	Electromagnetic waves that are used for satellite communications and cooking food.

molecule	A substance made of two or more atoms held together by covalent bonds.
momentum (HT only)	The product of the mass of an object and its velocity, measured in kilogram metres per second (kg m/s).
motor effect	The effect produced when a conductor carrying a current is placed in a magnetic field. The magnet producing the field and the conductor exert a force on each other.
moving-coil microphone (HT only)	A device that uses the generator effect to convert the pressure variations in sound waves into variations in current in electrical circuits.
mutation	A change in a gene or chromosome that may be caused by ionising radiation.
National Grid	The system of cables and transformers that transfers electrical power from power stations to consumers.
neutral wire	The wire of a mains cable that completes the circuit. It is coloured blue for easy identification.
neutron	A particle with no charge found in the nucleus of the atom. It has the same mass as a proton.
newton meter (spring balance)	A device used to measure force.
Newton's first law	If the resultant force acting on an object is zero and: <ul style="list-style-type: none"> • the object is stationary, the object remains stationary; • the object is moving, the object continues to move at the same speed and in the same direction. So the object continues to move at the same velocity.
Newton's second law	The acceleration of an object is proportional to the resultant force acting on the object, and inversely proportional to the mass of the object.
Newton's third law	Whenever two objects interact, the forces they exert on each other are equal and opposite.
Niels Bohr	The scientist who adapted the nuclear model by suggesting that electrons orbit the nucleus at specific distances.
non-contact force	A force that acts between objects that are physically separated.
non-renewable resource	An energy resource which cannot be replenished in a lifetime and will eventually run out.
normal contact force	A reaction force that acts at right angles to the surface on which an object rests.
normal (line)	A line at right angles to a surface.

nuclear energy store	The energy stored in the nucleus of an atom.
nuclear equation	An equation used to represent radioactive decay.
nuclear fuel	A substance used in nuclear reactors to provide energy through fission.
nuclear model	The model of the atom suggested by Rutherford. In this model, the mass of the atom is concentrated at the nucleus, which is positively charged.
nuclear reactor	A device that controls the release of energy from nuclear fission.
nucleus (plural: nuclei)	The centre of an atom, consisting of protons and neutrons. It is positively charged.
Ohm's law	The current through a resistor at a constant temperature is directly proportional to the potential difference across the resistor.
ohmic conductor	A component in which the resistance remains constant as the current changes, provided its temperature is the same.
orbit	A curved path that an object takes around another object.
oscillation	A single movement in one direction. A vibration.
parallel circuit	A circuit in which the current divides into two or more paths before recombining to complete the circuit.
particle model	A model that describes the arrangement and movement of particles in a substance.
peer review	The evaluation of scientific research by other scientists working in the same field.
penetration	The extent to which a type of radiation can be absorbed by a material.
period (of a wave)	The time taken for a wave to complete one vibrational cycle.
permanent magnet	A magnet that produces its own magnetic field.
physical change	A change in which no new substances are produced. Material recovers its original properties if the change is reversed.
plum pudding model	Thomson's model of the atom that suggested that the atom is a ball of positive charge with negative electrons embedded in it.
poles	The points on a magnet where the magnetic forces are strongest.
potential difference	A measure of the work done or the energy transferred to a component by each coulomb of charge that passes through it, measured in volts (V). Represented in an equation by the letter V.

power	The rate at which energy is transferred or the rate at which work is done, measured in watts (W).
power rating	The highest power input allowed to flow through a piece of equipment. The greater this rating, the more energy the equipment transfers each second.
pressure	The force per unit cross-sectional area for a force acting at right angles to a surface, measured in pascals (Pa) or newtons per metre squared (N/m^2).
proton	A particle with a charge of +1 found in the nucleus of an atom. It has the same mass as a neutron.
radiation	The transfer of energy as electromagnetic waves or as moving subatomic particles.
radiation dose	A measure of the risk of harm resulting from an exposure of the body to the radiation, measured in sieverts (Sv).
radio waves	Electromagnetic waves with the longest wavelength that are used for television and radio. (HT only) Can be produced by oscillations in electrical circuits and can induce oscillations in electrical circuits when absorbed.
radioactive contamination	The unwanted presence of materials containing radioactive atoms on other materials.
radioactive decay	The random process by which an unstable nucleus gives out radiation as it changes to become more stable.
radioactive isotopes	Atoms of the same element with different numbers of neutrons that have unstable nuclei.
radius	The distance from the centre to the circumference of a circle or sphere.
rarefaction	A region of low pressure in a longitudinal wave due to particles being spread further apart.
ray diagram	A diagram that shows the path of light rays.
reaction force	A force exerted in the opposite direction to an action force.
reaction time	The time between the presentation of a stimulus and the onset of a response.
refraction	The change in direction of a wave due to the change in velocity when moving from one medium to another.
reliability	The extent to which a constant supply of energy can be obtained from a resource.
renewable resource	An energy resource which can be replenished and will not run out.
repulsion	A force that causes objects to move away from each other.

resistance	The degree to which a component opposes the flow of electrical charge, measured in ohms (Ω). Represented in an equation by the letter R.
resistive force	A force that acts in the opposite direction to the movement of an object.
resistor	A component that limits the flow of electrical charge in a circuit.
resolution of forces (HT only)	The breaking down of a single force into two component forces acting at right angles to each other.
resultant force	A single force on an object that has the same effect as all the original forces acting together.
scalar quantity	A quantity that has magnitude only.
series circuit	A circuit in which the current follows one path.
shell	The distance from the nucleus of an atom where electrons orbit. Also called an energy level.
social	Relating to a community of people.
solar power	Energy transferred from the Sun.
solenoid	A coil of wire that produces a magnetic field when a current flows through it.
solid	The state of matter in which a substance has a fixed shape and cannot flow or be compressed. The particles are close together in a regular arrangement.
sound	Transfer of energy via mechanical waves.
specific heat capacity	The amount of energy required to raise the temperature of one kilogram of a substance by one degree Celsius, measured in joules per kilogram per degree Celsius ($\text{J/kg } ^\circ\text{C}$).
specific latent heat	The amount of energy required to change the state of one kilogram of a substance with no change in temperature, measured in joules per kilogram (J/kg).
specific latent heat of fusion	The latent heat required for the change between a solid and a liquid (melting or freezing), at the melting point of a substance.
specific latent heat of vaporisation	The latent heat required for the change between a liquid and a gas (evaporating or condensing), at the boiling point of a substance.
speed	The distance travelled by an object in a specific time, measured in metres per second (m/s). It is a scalar quantity.
spring constant	A measure of the stiffness of a spring, measured in newtons per metre (N/m).
state of matter	The classification of a substance as solid, liquid or gas.

stationary	Not moving.
step-down transformer	An electrical device used to decrease the size of an alternating potential difference for domestic use.
step-up transformer	An electrical device used to increase the size of an alternating potential difference to make transmission more efficient.
stopping distance	The sum of the distance a vehicle travels during the driver's reaction time (thinking distance) and the distance it travels under the braking force (braking distance).
sublimation	A change of state from solid to gas.
submerge	To cause something to be under water.
system	An object or group of objects.
tangent	A straight line that touches a curve (on a graph) at a given point.
temperature	The average kinetic energy of the particles in a substance, measured in degrees Celsius ($^{\circ}\text{C}$).
tension	A force transmitted through a rope, string or wire when pulled by forces acting from opposite sides.
terminal velocity	The maximum velocity reached by an object when the resistive forces on it are equal and opposite to the forces making it move.
theory	A general explanation that applies to a wide range of situations and examples.
thermal	Relating to heat.
thermal energy store	See internal energy store.
thermal conduction	The transfer of thermal energy through a solid.
thermal conductivity	A measure of how easily energy can be transferred through the material by conduction.
thermistor	A resistor that causes the resistance of a circuit to decrease as temperature increases.
thermostat	A device that automatically regulates temperature, or that activates a device when the temperature reaches a certain point.
thinking distance	The distance a vehicle travels during the driver's reaction time.
tidal power	Energy harnessed from tidal flow.



transformer	An electrical device used to change the size of an alternating potential difference.
transmission	The movement of a wave through a material.
transverse wave	A wave with oscillations perpendicular to the direction of energy transfer, e.g. electromagnetic waves.
ultraviolet (UV)	A type of electromagnetic wave that causes skin to age prematurely and increases the risk of skin cancer.
upthrust	The upward force that a fluid exerts on an object floating in it.
vacuum	An absence of matter.
variable resistor	A component used to control the current in a circuit by changing the resistance.
vector diagram (HT only)	A diagram that uses arrows to show the direction and relative magnitude of a vector quantity.
vector quantity	A quantity that has magnitude and an associated direction.
velocity	Speed in a given direction. It is a vector quantity.
velocity-time graph	A graph showing how the velocity of an object changes over time.
visible light	The portion of the electromagnetic spectrum that our eyes can detect.
voltmeter	A component used to measure the potential difference across a component in a circuit.
volume	The amount of space that a substance or object occupies.
wasted energy	Energy that is not transferred usefully. This energy is dissipated or lost from the system.
wave front diagram	A diagram showing how far apart the crests of the waves are.
wave power	Energy harnessed from the motion of waves.
wave speed	The speed at which energy is transferred (or the wave moves) through a medium, measured in metres per second.
wavelength	The distance from a point on one wave to the equivalent point on the adjacent wave.
weight	The force acting on an object due to gravity, measured in newtons (N).
wind power	Energy harnessed from the wind by large turbines.

work done	The transfer of energy from one energy store to another.
X-rays	Ionising electromagnetic radiation that can cause the mutation of genes and cancer. Used for medical imaging and treatments.

