

Definition questions want the syllabus wording, not your own words. Each one below is written the way a mark scheme accepts it. Learn the whole sentence – the second half is usually the second mark. ,

Motion, forces and energy

Speed — distance travelled per unit time

Velocity — speed in a given direction

Acceleration — change in velocity per unit time

Scalar — a quantity that has magnitude (size) only

Vector — a quantity that has magnitude and direction

Mass — a measure of the quantity of matter in an object at rest

Weight — the gravitational force on an object that has mass

Density — mass per unit volume

Resultant force — the single force that has the same effect as all the forces acting on the object

Newton's third law — when object A exerts a force on object B, B exerts an equal and opposite force on A

Moment of a force — force times the perpendicular distance from the pivot

Principle of moments — for an object in equilibrium, the total clockwise moment about a point equals the total anticlockwise moment about that point

Centre of gravity — the point at which the whole weight of the object may be considered to act

Momentum — mass times velocity

Work done — force times distance moved in the direction of the force

Power — work done per unit time, or energy transferred per unit time

Efficiency — useful energy output divided by total energy input, usually as a percentage

Principle of conservation of energy — energy cannot be created or destroyed, only transferred from one store to another

Pressure — force per unit area

Thermal physics

Brownian motion — the random movement of small particles suspended in a fluid, caused by collisions with fast-moving molecules

Internal energy — the total energy of the molecules of a substance – the kinetic energy of their motion plus the potential energy of their separation

Temperature — a measure of the average kinetic energy of the molecules

Specific heat capacity — the energy needed to raise the temperature of 1 kg of a substance by 1 °C

Melting / boiling point — the temperature at which a solid changes to a liquid, or a liquid changes to a gas, at constant temperature

Evaporation — the escape of the more energetic molecules from the surface of a liquid, which cools the liquid left behind

Conduction — the transfer of thermal energy through a substance without the substance itself moving

Convection — the transfer of thermal energy by the movement of a heated fluid, which is less dense and rises

Thermal radiation — the transfer of energy by infrared waves, which needs no medium

Waves

Wavefront — a line joining points on a wave that are in phase

Amplitude — the maximum distance a point moves from its undisturbed position

Wavelength — the distance between two adjacent points in phase, for example crest to crest

Frequency — the number of waves passing a point per second

Transverse wave — a wave in which the vibrations are at right angles to the direction of travel

Longitudinal wave — a wave in which the vibrations are along the direction of travel

Reflection — the bouncing back of a wave at a surface, with the angle of incidence equal to the angle of reflection

Refraction — the change in direction of a wave when its speed changes as it passes from one medium to another

Critical angle — the angle of incidence in the denser medium for which the angle of refraction is 90°

Total internal reflection — when light travelling in a denser medium meets the boundary at an angle greater than the critical angle, all of it is reflected

Refractive index — the ratio of the speed of light in a vacuum to its speed in the medium, or $\sin i$ divided by $\sin r$

Focal length — the distance from the centre of a lens to its principal focus

Electricity and magnetism

Electric current — the charge passing a point per unit time

Potential difference — the work done by a unit charge passing from one point to another

Electromotive force — the electrical work done by a source in moving a unit charge around a complete circuit

Resistance — potential difference divided by current

Ohm's law — for a metallic conductor at constant temperature, the current is proportional to the potential difference

Series circuit — components connected one after another, so the current is the same everywhere and the p.d.s add

Parallel circuit — components connected across each other, so the p.d. is the same across each and the currents add

Magnetic field — a region in which a magnetic pole experiences a force

Electromagnetic induction — the production of an e.m.f. when a conductor cuts magnetic field lines, or when the field through a coil changes

Transformer — a device that changes the voltage of an alternating supply, in the ratio of the numbers of turns on its two coils

Nuclear and space physics

Nucleon number / proton number — the total number of protons and neutrons in a nucleus; the number of protons in a nucleus

Isotope — atoms of the same element with the same number of protons but different numbers of neutrons

Background radiation — the ionising radiation always present from natural and man-made sources, which must be subtracted from a count rate

Radioactive decay — the spontaneous and random breakdown of an unstable nucleus, emitting radiation

Half-life — the time taken for half the nuclei of a sample to decay, or for the count rate to fall to half its value

Ionising radiation — radiation that removes electrons from atoms, forming ions – alpha ionises most, gamma least

Redshift — the increase in the observed wavelength of light from a galaxy moving away from us

Hubble constant — the ratio of the speed at which a galaxy recedes to its distance from Earth; its reciprocal estimates the age of the Universe