Term	Definition
Measurement	
Scalar Quantity	A physical quantity that has magnitude but not direction E.g. Mass, Distance, Speed, Energy
Vector Quantity	A physical quantity that has both magnitude and direction E.g. Force, Displacement, Velocity, Acceleration
Kinematics	
Speed	Rate of change of distance
Velocity	Rate of change of displacement
Acceleration	Rate of change of velocity
Dynamics	
Newton's 1st Law of Motion	An object will continue in its state of rest or uniform motion unless a resultant force acts on it
Newton's 2nd Law of Motion	When a resultant force acts on an object of constant mass, the object will accelerate and move in the direction of the resultant force. The product of the mass and acceleration of the object is equal to the resultant force
Mass, Weight & Density	
Mass	Amount of matter or substance in a body
Weight	Amount of gravitational force acting on a body
Inertia	Reluctance of a body to change its state of rest or motion
Gravitational Field	Region in which a mass experiences a force due to gravitational attraction
Gravitational Field Strength	Gravitational force per unit mass at a point.
Density	Mass per unit volume
Turning Effect of Forces	
Moment of a Force	The product of the force and the perpendicular distance from the pivot to the line of action of the force
Principle of Moments	When a body is in equilibrium, the sum of clockwise moments **about a pivot** is equal to the sum of anticlockwise moments **about the same pivot**
Centre of gravity	The imaginary point through which the entire weight of an object appears to act **for any orientation**
Stability	The ability of an object to return to its original position after it has been tilted slightly
Pressure	
Pressure	Force exerted/acting per unit area
Energy, Work & Power	
Principle of Conservation of Energy	Energy can neither be created nor destroyed. It can only be converted from one form to another or transferred from one body to another, but the total amount of energy remains constant

Term	Definition
Work Done	The product of the force on a body and the distance moved by the body in the direction of the force
Power	Rate of work done
Kinetic Model of Matter	
Brownian Motion	The continuous and random motion of smoke particles in air (or pollen grains in water) due to uneven bombardment by air molecules (or water molecules)
Transfer of Thermal Energy	
Thermal Equilibrium	No net gain or loss of thermal energy between two bodies in contact
Conduction	Process of thermal energy transfer without any flow of the material medium (through molecular vibrations)
Convection	Process of thermal energy transfer by means of bulk movement of the fluid
Radiation	The continual emission of infrared waves from the surface of a body, transmitted without the aid of a medium
Temperature	
Thermometric Substance	Substance which have physical properties that vary continuously with temperature E.g. Resistance, EMF, Pressure
Fixed Points	Points that are of standard degrees of hotness or coldness which are easily obtainable and reproducible
Ice Point	Temperature of pure melting ice **at one atmospheric pressure**
Steam Point	Temperature of steam from boiling water **at one atmospheric pressure**
Thermal Properties of Matter	
Internal Energy	The sum of the energy due to the vibration of the particles (KE) and the stretching and compressing of intermolecular bonds (PE)
Heat Capacity	The amount of thermal energy required to raise the temperature of a substance by unit temperature (1K).
Specific Heat Capacity	The amount of thermal energy required per unit mass (1 kg) to raise the temperature of a substance by unit temperature (1K).
Melting/Solidification	The change of state of a substance from solid to liquid (or vice-versa) **without a change in temperature**
Boiling/Condensation	The change of state of a substance from liquid to vapour (or vice-versa) **without a change in temperature**
Latent Heat	The amount of thermal energy absorbed or released during a change of state **without a change in temperature**
Specific Latent Heat of Fusion	The amount of thermal energy per unit mass (1 kg) required to change a substance from solid to liquid, or vice-versa, **without any change in temperature**

Term	Definition
Specific Latent Heat of Vaporisation	The amount of thermal energy required per unit mass (1 kg) to change a substance from liquid to vapour, or vice-versa, **without any change in temperature**
General Wave Properties	
Wave Motion	The direction in which energy is propagated by the wave
Transverse Waves	Waves in which the direction of the vibration of the particles is perpendicular to the direction of wave motion
Longitudinal Waves	Waves in which the direction of the vibration of the particles is parallel to the direction of wave motion
In-Phase	Points having the direction of motion, speed and displacement from the rest position
Crest	The highest point of a transverse wave
Trough	The lowest point of a transverse wave
Amplitude	Maximum displacement from the rest position
Period	The time taken for one point on a wave to compiete a full oscillation
Frequency	The number of complete oscillations by one point on a wave per second
Wavelength	Distance travelled by the wave in a time of one period
	Any one of the following: (i) The distance between any two adjacent points that are in phase (ii) The distance between any two adjacent crests or troughs
Wavefront	An imaginary line on a wave that joins all points that are in the same phase
Light	
Point of Incidence	The point on a surface where the incident ray hits
Normal	The perpendicular line to a surface at the point of incidence
Angle of Incidence	The angle between the incident ray and the normal
Angle of Reflection	The angle between the reflected ray and the normal
*First Law of Reflection	The incident ray, reflected ray and the normal to the reflecting surface all lie in the same plane
*Second Law of Reflection	The angle of incidence is equal to the angle of reflection
Angle of Refraction	The angle between the refracted ray and the normal
Refractive Index	The ratio between the speed of light in vacuum and the speed of light in a medium
Critical Angle	The angle of incidence in the optically denser medium for which the angle of refraction in the optically less dense medium is 90°
Total Internal Reflection	The phenomenon in which an incident light ray travelling from an optically denser to less dense medium is fully reflected back at the boundary between the two optical media

Term	Definition
Focal Point	The point at which all rays parallel to the principal axis converge to after refraction by a lens
Focal Length	The distance between the optical centre and the focal point
Sound	
Compression	Regions where the air pressure is slightly higher than the surrounding air pressure
Rarefaction	Regions where the air pressure is slightly lower than the surrounding air pressure
*Range of Audibility	The range of frequencies which a person can hear (typically from 20 Hz to 20 kHz)
Ultrasound	Sound with frequencies above the upper limit of the human range of audibility, which is typically around 20 kHz
Static Electricity	
Electric Field	Region in which an electric charge experiences an electric force
Direction of Field Lines	Defined as the direction of the electric force acting on a small positive test charge
Electric Field Strength	Force per unit charge on a positive test charge at that point.
Current of Electricity	
Current	Rate of flow of electric charge
Convention Current Flow	Positive charges flowing from a positively charged end to a negatively charged end
Electron Flow	Electrons flowing from a negatively charged end to a positively charged end
Electromotive Force	Work done by a source in driving a unit charge around a complete circuit
Potential Difference (across a component)	Work done in driving a unit charge through the component
Resistance	The ratio of the p.d. across a conductor and the current flowing through it
Ohm's Law	The current passing through a metallic conductor is directly proportional to the potential difference across it, provided the physical conditions are constant
Practical Electricity	
Live Wire	The wire that is maintained at a non-zero electric potential, typically from -240 V to 240 V, with respect to the neutral wire
Neutral Wire	The wire that is maintained at 0 V
Earth Wire	A low resistance wire that is connected to the metal casing of an appliance
Magnetism	
Magnetic Induction	Process of bringing about magnetism in ferromagnetic materials.

Term	Definition
Magnetic Field	Region in which a magnetic object experiences a magnetic force
Electromagnetic Induction (EMI)	
Electromagnetic Induction	Process of using a varying magnetic field to bring about an electromotive force (emf), and hence an induced current, in a closed circuit
Faraday's Law of EMI	*Any one of the following:* (i) The induced emf in a conductor is proportional to the rate of change of magnetic field lines of forces linking to it (ii) The induced e.m.f. in a conductor is proportional to the rate of change of magnetic flux linkage to it
Lenz's Law	The direction of the induced emf, and hence induced current, is such that its magnetic effect opposes the change in magnetic flux that causes it.
Transformer	A device which varies the voltage between the primary circuit and the secondary circuit, via electromagnetic induction, without a change in frequency.
Rectification	The process of converting an a.c. source into d.c.