Topic 1 Units & Measurements

period (T)	**time taken** for **one complete oscillation**
scalar	physical quantity with **magnitude** and no direction
vector	physical quantity with **magnitude and direction**

Topic 2 Kinematics

distance (scalar)	**total length of travel** by a moving object
displacement (vector)	measure of change in **position** of an object
speed (scalar)	**distance travelled** per unit time
velocity (vector)	rate of change of **displacement**
acceleration (vector)	rate of change of **velocity**
free fall	constant weight falling **without air resistance**

Topic 3 Force & Pressure

forces	**push or pull** acting on an object
mass (scalar)	measure of the **amount of matter** in a body
weight (vector)	**gravitational force** acting on a body
gravitational force	a region in which a **mass experiences a force due to gravitational attraction**
gravitational field strength	gravitational force **per unit mass at that point**
density	**mass** of substance in a **unit volume**
pressure	**force** acting per **unit area**

Topic 4 Dynamics

Newton's Laws (only need to know how to apply)	*N1L*	an object will continue its **state of rest or stay in motion** at uniform velocity **unless a resultant force acts on it**
	N2L	when an object of constant mass experiences a resultant force, it will **accelerate in its direction**. the **product of the mass and acceleration** of the object is **equal** to the **resultant force**. ($F_{resultant}$=ma)
	N3L	every action has an **equal & opposite reaction**, where the forces act on **mutually opposite bodies** (action reaction pair)
Friction		force that **slows down or stops the movement** of **one surface against another**

Topic 5 Turning Effects of Forces

moment of a force	*the **product of the force** and the **perpendicular distance from the pivot to the line of action of force***
principle of moments	*for a body at **equilibrium**, the **sum of clockwise moments about a pivot** is **equal** to the **sum of anti clockwise moments about the same pivot***
centre of gravity	***imaginary point** at which the **entire weight of the object acts on***
stability	*ability of a body to **restore to its original position** after being **displaced***

Topic 6 Energy

work done	***product** of the **force & the distance moved in the direction of the force***
energy	*the ability to **do work***
kinetic store (ke)	*the energy an object has due to its **motion***
gravitational potential store (gpe)	*the energy a body possesses because of its **position relative to the ground***
principle of conservation of energy	*energy cannot be **created or destroyed**, but only **changes from one form to another**. total energy is constant (not considering dissipative forces)*
power	*rate of **work done / energy conversion***

Topic 7 Kinetic Particle Model of Matter

internal energy	sum of **kinetic energy** and **potential energy**
heat	transfer of **thermal energy** from a **body of higher temperature to another of lower temperature**
temperature	measure of **degree of hotness or coldness** of a body, indicated by the **average kinetic energy** of its molecules

Topic 8 Thermal Properties of Matter

thermal equilibrium	heat flows from a region of higher temperature to a region of lower temperature until **both are at the same temperature**
conduction	the process by which heat is transferred **through a medium from one particle to another**
convection	the process by which heat is transmitted from one place to another by **movement of heated particles in a gas/liquid due to a difference in density**
radiation	the transfer of thermal energy in the form of **electromagnetic waves** such as infrared radiation **without the aid of a medium**

Topic 9 General Wave Properties

waves	energy transferred by means of vibrations **without the transfer of medium**
transverse waves (TW)	particles travel **perpendicular** to to the direction of vibration of wave particles
longitudinal waves (LW)	particles travel **parallel** to the direction of vibration of wave particles
amplitude	**maximum displacement** from rest position
crest	**highest** point of transverse wave
trough	**lowest** point of transverse wave
wavelength (lambda, λ)	distance between **2 successive crests and troughs** (TW) or **successive compressions and rarefactions** (LW)
period (T)	**time taken** for **one complete wave**
frequency (f)	**number of waves** generated in **one second**
wave speed (v)	**distance moved** by wave in **one second**
wavefront	**imaginary line** connecting adjacent points in the **same phase of vibrations**
sound	a form of energy produced by the **vibration of objects placed in a medium**

Topic 11 Light

*laws of **reflection***	incident ray, reflected ray, and normal all **lie on the same plane** **angle of incidence = angle of reflection**
refraction	the **bending effect of light** as it passes from **one optical medium to another** due to **change in speed**
*laws of **refraction***	incident ray, reflected ray, and normal all **lie on the same plane** for any **two particular media**, the **ratio** of the **sine of the angle of incidence** to the **sine of the angle of refraction** is a **constant** *(n = sin i / sin r)*
refractive index	the ratio of the **speed of light in vacuum** to the **speed of light in the medium**
focal point	point where **parallel light rays meet** after passing through lens and coming to a focus
focal length	distance between **optical centre and principal focus**

Topic 12 Electric Charge & Current of Electricity

current	**rate of flow of electric charges** through a given **cross-section of a conductor**
electromotive force (emf)	the **work done by the source** in driving a **unit charge around a complete circuit**
potential difference (pd)	the **work done per unit charge** in driving **charges through a component**
resistance	the **ratio** of the **potential difference** across it to the **current** flowing through it ($R = \frac{V}{I}$)
resistivity	property of a material, independent of dimensions

Topic 15 Magnetism & Electromagnetism

magnetic field	region around a magnet in which a **magnetic force can be detected**
induced magnetism	magnetic materials are magnetised when **near or in contact with a permanent magnet**
the motor effect	when **current carrying conductor** is placed in a magnetic field, it experiences a **force** *(FLHR)*

Topic 16 Radioactivity

nuclear decay	**spontaneous** and **random** process that occurs when an **unstable nucleus transitions into a more stable state** by emitting radiation
random	cannot know **which** nucleus will decay
spontaneous	cannot know **when** nucleus decay will occur
half life	**time taken** for **half** the number of nuclei to decay
background radiation	**standard radiation levels** in the environment