YEAR 10 PHYSICS (IGCSE) LONG TERM PLAN with CURRICULUM STANDARDS

YEAR 10 PHY	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 1	Y10/PHY1 (32) Forces and Motion							
	Units	Movement and position		Forces, movement, shape and momentum				
	Use the following units: kilogram (kg), metre (m), metre/second (m/s), metre/second2 (m/s2), newton (N), second (s) and newton/kilogram (N/kg). use the following units: newton metre (Nm), kilogram metre/second (kg m/s)	Differentiate between vector and scalar quantities Define displacement, speed, velocity and acceleration of an object. Draw and interpret d - t and v - t graphs. Describe a range of laboratory methods for determining the speeds of objects such as the use of light gates. Use the equations $v = d/t$, $a = (v - u) / t$ and $v^2 - u^2 = 2 \times a \times s$ to determine acceleration. Analyse velocity/time graphs. Investigate the motion of everyday objects such as toy cars or tennis balls Assessment 1		Identify different types of force such as gravitational or electrostatic. Calculate the resultant force of forces that act along a line. Draw and interpret free body diagram. . Use the equations R.F = m x a and W = m x g. Introduce the term 'action-reaction' pairs. Define momentum and use the equation p = m x v. State and explain the conservation of linear momentum. Apply Newton's third law to collision interactions and relate it to the conservation of momentum in collisions. Define Newton's second law as rate of change of momentum. Use the concept of momentum to explain the role of safety features of the car. Identify factors affecting stopping distance of a vehicle. Describe the forces acting on falling objects.Know that the initial linear region of a force-extension graph is associated with Hooke's law .Describe elastic behaviour of an object. Know and use the relationship :moment = force × perpendicular distance from the pivot. Use the principle of moments for a simple system of parallel forces acting in one plane .Investigate how extension varies with applied force for helical springs, metal wires and rubber bands Assessment 2			

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TERM 1	PHY10/P2 (28) Waves							
	Units and properties of waves	Electromagnetic spectrum		Light and Sound				Revision
	Use the following units: degree (°), hertz (Hz), metre/second (m/s) . Explain waves transfer energy without transferring matter. Use the terms frequency, wavelength, amplitude, period and wavefront for waves. Explain the difference between long and transv waves. Use the equations: wave velocity $v = f\lambda$ and frequency = 1/T Explain what the Doppler effect Assessment 3	Describe the continuous electromagnetic spectrum which can be grouped in order of decreasing wavelength and increasing frequency. Identify common properties of electromagnetic waves. Identify the harmful effects, of excessive exposure to the electromagnetic radiations. Describe characteristic properties and uses and danger of each electromagnetic radiation.Describe the effects of radiations on atoms Assessment 4		Use the law of reflection draw ray diagrams to illustrate reflection and refraction. Know and use the relationship n= sin i/sin r. Describe the role of TIR in transmission along optical fibres and in prisms. Know and use the relationship sin C= 1/n. Know that the audible frequency range for human hearing.Understand how the pitch of a sound relates to the frequency of vibration of the source and loudness to amplitude. Investigate 1) the refraction of light, using rectangular blocks, semi-circular blocks and triangular prisms 2) speed of sound in air 3) frequency of a sound wave using an oscilloscope Assessment 5			Revision for First Term Exam

YEAR 10 PHY	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 2	PHY10/P3(28) Energy Resources and Energy Transfers							
	Units and Energy transfer		Work and power		Energy resources and electricity generation			
	Use the following units: kilogram (kg), joule (J), and watt (W). Use diagrams to represent energy transfers. Describe the concept of conservation of energy for different situations.Calculate efficiency and explain how efficiency can be increased. Investigate thermal		Know and use the relationships W = F x d, GPE= mgh and KE= 1/2 mv2. Understand how conservation of energy produces a link between gravitational potential energy, kinetic energy and work. Describe power as the rate of transfer of		Describe the energy transfers involved in generating electricity using:• wind, water, geothermal resources,solar heating systems, solar cells,fossil fuels, nuclear power describe the advantages and disadvantages of methods of large-scale electricity production from various renewable and non-renewable resources Assessment 7			

2	energy transfer by conduction, convection and radiation		energy or the rate of doing work. P = W/ t Assessment 6					
YEAR 10 PHY	WEEK 1	WEEK 2	WEEK 3	WEEK 4	WEEK 5	WEEK 6	WEEK 7	WEEK 8
TERM 2	PHY10/P4(24)Solids, Liquids and Gases							
	Density and pressure		Change of state		Ideal gas molecules		Revision	
	Know and use the relationship density = mass/ volume and pressure = F /A . Understand how the pressure at a point in a gas or liquid at rest acts equally in all directions. know and use the relationship pressure difference = height × density × gravitational field strength p = h × ϱ × g Assessment 8		Explain why heating a system will change the energy stored within the system and raise its temperature or produce changes of state. Describe the changes that occur during change of state. Describe the arrangement and motion of particles in solids, liquids and gases. Define specific heat capacity Use equation ΔQ = m × c × ΔT Investigate the specific heat capacity of materials including water and some solids		Recognize absolute zero as the lowest possible temperature. Describe the effect of changing the temperature of a gas on the speed of its particles and pressure. Use the relationship between the pressure and Kelvin temperature of a fixed mass of gas at constant volume:Use equation P1 ×V1 = P2 ×V2 to calculate pressure or volume for gases of fixed mass at constant temperature. Assessment 9		Revision for the Final Exam	