A Level Year 1 Physics Course outline

Students have eight Physics lessons per cycle taught by two specialist Physics teachers.

Teacher A Autumn term

Term	Topic and approximate duration	Key learning areas	Homework
Autumn term	**Induction (1 week)**	Students will learn how to take concise and informative notes and how to organise their folders. Pupils will learn how to research effectively. Students will do the AQA CPAC training and get a certificate.	
	Measurements and errors (2 weeks)	Students will learn about calculations of uncertainties in measured and derived data. They will understand the significance of percentage uncertainties and will be able to use practical skills to reduce uncertainties in their data. They will understand how to present experimental data in both tables and graphs and how to analyse data to find relationships between values.	Prep and consolidation tasks set through Firefly.
	Waves (10 weeks)	Students will review GCSE knowledge of transverse and longitudinal waves and describe polarisation and the superposition of stationary waves. Students will describe progressive and standing waves, including ideas about interference and superposition and Young's slits diffraction experiment. Students will be able to describe polarisation, refraction and explain these effects. Students will make calculations based on diffraction gratings and Young's slit experiment. **Required practical 1** – Investigation into the variation of the frequency of stationary waves on a string with length, tension and mass per unit length of the string. **Required practical 2** - Investigation of interference in Young's slit experiment and diffraction by a diffraction grating.	Prep and consolidation tasks set through Firefly. Waves assessed homework task.
	Nature of landmark assessment	Interim will be mostly MCQs. Landmark will be short and long answer questions.	

Teacher B Autumn Term

Term	Topic and approximate duration	Key learning areas	
Autumn term	**Induction (1 week)**	Students will practice basic mathematical skills such as rearranging equations and trigonometry. Students will practice graphical skills.	
	Mechanics (12 weeks)	Students will review GCSE ideas about scalar and vector quantities. Students will investigate moments and describe their applications in everyday situations and balance calculations. Students will use trigonometry to resolve coplanar vectors into perpendicular components and describe what is meant by an object's centre of mass. Students will investigate and describe the motion of objects in a straight line including the use of 'suvat' equations in examples where acceleration is constant, such as free fall under gravity. Students will do **required practical 3** - a **determination of g by a free fall method.** Students will investigate methods of measuring the acceleration due to gravity and carry out some tests themselves. They will make predictions and calculate the motion of a projectile including describing the motion in two perpendicular planes. Students will be able to describe, explain and apply Newton's Laws of motion in different situations. Students will be able to describe and calculate momentum and impulse in collisions and explosions and show how vehicles are ethically designed to take into account the changes in momentum in collisions. Students will be able to calculate work done, energy, power and efficiency as well as apply the principles of conservation of energy.	Prep and consolidation tasks set through Firefly. Terminal velocity assessed homework task.
	Nature of landmark assessment	Interim will be mostly MCQs. Landmark will be short and long answer questions.	

Teacher A Spring term

Term	Topic and approximate duration	Key learning areas	Homework
Spring term	**Current electricity (11 weeks)**	Students will review and add to GCSE understanding of current, charge and potential difference. They will be able to define produce I-V curves for different components and will complete **required practical 5** – the determination of resistivity of a wire using a micrometer, ammeter, and voltmeter. Students will describe and explain how superconductors, thermistors and other components within circuits work together.	Prep and consolidation tasks set through Firefly.
	Nature of landmark assessment	Interim will be mostly MCQs. Landmark will be short and long answer questions.	

Teacher B Spring term

Term	Topic and approximate duration	Key learning areas	Homework
Spring term	**Materials (4 weeks)**	Students will study, define and measure tensile stress and strain and use these to define the Young's Modulus of materials. They will apply this measurement to materials in different situations and describe the properties necessary, justifying their ideas. Students will carry out **required practical 4** – a determination of the Young modulus by a simple method.	Prep and consolidation tasks set through Firefly.
	Particles (7 weeks)	Students will be able to describe the structure of an atom and the internal structure of protons and neutrons. They will understand what is meant by the fundamental particles described by the standard model of physics and how these form baryons, mesons, hadrons and leptons. They will describe particle interactions as the exchange of virtual bosons including in creation and annihilation interactions, and how to represent these using Feynman Diagrams.	Prep and consolidation tasks set through Firefly.
	Nature of landmark assessment	Interim will be mostly MCQs. Landmark will be short and long answer questions.	

Teacher A Summer term

Term	Topic and approximate duration	Key learning areas	Homework
Summer term	**Current electricity** (4 weeks)	Students will be able to apply rules for how current and potential difference behave in series and in parallel circuits. Students will understand the concepts of EMF and effects of internal resistance. They will carry out **required practical 6** – an investigation of the emf and internal resistance of electric cells and batteries by measuring the variation of the terminal p.d. of the cell with current in it.	
	Nature of landmark assessment	Interim will be mostly MCQs with a short answer question requiring the application of knowledge. Landmark will be 20 MCQ, with a few short answer questions, and 1 extended response question.	

Teacher B Summer term

Term	Topic and approximate duration	Key learning areas	Homework
Summer term	**Quantum phenomena and EM radiation** (4 weeks)	Students will be able to describe the photoelectric effect and how this gives evidence for the particle model of light. They will review how quantum effects show that particles can behave as waves. Students will use the photon model of light to describe energy levels within the atom and how excitation and ionisation occur within fluorescent tubes.	Prep and consolidation tasks set through Firefly.
	Nature of landmark assessment	Interim will be mostly MCQs. Landmark will be short and long answer questions.	

In the summer term the A Level course remaining content will begin.