

KS5 Long Term Curriculum Plan: A LEVEL PHYSICS Year 12 2021-2022

Curriculum Aim:

In A Level Physics we extend on the knowledge of GCSE and aim to prepare, inspire and nurture a passion for physics, whilst laying the groundwork for further study in science or engineering. We do this by covering a wide range of topics including the fundamental units of measurement, properties of matter and electromagnetic radiation. Students gain an understanding of the importance of international collaboration in the development of new experiments and theories. Students learn essential practical skills throughout the course and are prepared to be analytic thinkers and problem solvers.

Link to prior learning: The subject builds on key knowledge and skills from GCSE Sciences, whilst diving deeper into key topics such as properties of matter, radiation, waves, vectors, force, energy and momentum.

Rationale of sequencing:

We begin the course by focusing and developing on essential skills from GCSE on the fundamental (base) units of measurement, prefixes and standard form. These underpin the content for all other topics covered, thus students learn the essential calculation skills to solve problems in the topics later in the course. Throughout all topics we practice essential practical skills beginning with the nature of measurement errors and of their numerical treatment. Topics link from one to another; we use continuous recall starters to embed content.

	Focus / Topic	Knowledge & Skills (from NC/Programmes of Study)	Assessment
Autumn 1	Measurements and their errors	Students will gain an understanding of: <ul style="list-style-type: none"> • SI units, prefixes, uncertainties. Estimation. • Progressive and stationary waves and the principle of superposition of waves. • Constituents of the atom, and stable/unstable nuclei. • Particles, antiparticles and photons. • Particle interactions • Classification of particles. Including quarks and antiquarks. • Applications of conservation laws. • Scalars and vectors. • Moments. • Motion along a straight line and Projectile motion. Students will develop key skills such as writing effective risk assessments and carry out experiments safely. Ability to calculate and manipulate data.	Baseline exam to assess students GCSE knowledge that is essential for the A level course. w/b 6th September 2021 Paper 1 style exam on all content taught so far. Assessment week (w/b 15th Nov 2021)
	Waves part 1		
Autumn 2	Particles and radiation Mechanics		
Spring 1	Particles and radiation Mechanics Electricity	Students will gain knowledge of: <ul style="list-style-type: none"> • The photoelectric effect. • Collisions of electrons with atoms. • Energy levels and photon emission. • Wave-particle duality. • Momentum. • Work, energy and power. • Conservation of energy. • Newton's laws of motion. 	

		<ul style="list-style-type: none"> • Current– voltage characteristics. <p>Students will develop key skills such as effectively recording experimental data and developing their observational skills. In additional graph analysis and extracting key information such as, determining g from a graph.</p>	
Spring 2	Waves part 2 Materials Electricity	<p>Students will gain knowledge of:</p> <ul style="list-style-type: none"> • Interference • Diffraction • Refraction at a plane surface. • Bulk properties of solids. • Resistivity. Circuits. Potential divider. <p>Students will continue to develop key skills such as the ability to effectively design and plan an investigation, including explaining their choice of method. They will also practise skills such as using free-body diagrams, and rearranging equations.</p>	<p>2 x Year 1 style papers on all content covered to this date. 1 paper per teacher.</p> <p>Assessment week (w/b 21st Feb 2022)</p>
Summer 1	Waves part 2 Materials Electricity	<p>Students will gain knowledge of:</p> <ul style="list-style-type: none"> • Refraction at a plane surface. • The Young modulus. • Research and referencing skills • Electromotive force and internal resistance <p>They will continue to develop key practical skills such as comparing the use of analogue and digital meters. Estimating the volume of an object leading to an estimate of its density.</p>	
Summer 2	Thermal Physics part 1	<p>Students will gain knowledge of:</p> <ul style="list-style-type: none"> • Thermal energy transfer. • Ideal gases. <p>They will continue to develop key practical skills such as the ability to process and analyse data.</p>	<p>End of year Mock based on Year 1 content. End of Year exams (w/b 20th June 2022)</p>

Further Information

The Course Specification <https://filestore.aqa.org.uk/resources/physics/specifications/AQA-7407-7408-SP-2015.PDF>

All topics will be assessed with an end of module exam (every 3-4 weeks). Practical skills will be assessed throughout the course during required practicals. Students are expected to complete 5 hours of additional study per week for this course.

