Year: 12 & 13

Subject: Physics

VISION: At KS5 we build upon the strong foundation in Physics formed at GCSE in order to further explore the world around us. Wherever possible real-world examples and the relevance of Physics to modern society is emphasised. We recognise that students taking A-level Physics do so for a variety of reasons and we aim that no matter what the pathway post-18 our students leave with a strong appreciation for Physics' place in the world and the scientific method. In a similar manner to KS4, retrieval, deliberate practice and exam question practice are used extensively. Formal mock examinations are conducted frequently so that students are well aware of their strengths and weaknesses within the subject. Study skills, revision schedules and exam practice classes are all part of our regular curriculum.

	Foci	Assessment	Knowledge Organiser
AS Content			
Unit 1	Quantities • Quantities and units • Derived units • Scalars and vectors • Adding vectors • Resolving vectors	End of topic test	
Unit 2	Motion • Distance and speed • Displacement and velocity • Acceleration • Velocity time graphs • Equations of motion • Stopping distances • Free fall and g • Projectile Motion	End of topic test	
Unit 3	Electric Current, Charge, Energy, Power and Resistance • Charge and current • Kirchoff's Laws • Drift velocity • Potential difference • Resistance • Component characteristics • Resistivity • Resistance • Thermistors and LDRs • Electrical energy and power • Cost of electricity	End of topic test	
Unit 4	Forces in Action • Force, mass and weight • Free body diagrams • Drag and terminal velocity • Moments and equilibrium • Couples and torques • Triangles of forces • Density and pressure • Archimedes' Principle	End of topic test	

Nobel

Year: 12 & 13

Subject: Physics

Unit 5	Newton's Laws • Newton's 1st Law • Newton's 2nd Law • Newton's 3rd Law • Momentum • Impulse • Collisions in 2D	End of topic test	
Unit 6	Electric Circuits • Kirchoff's Laws and Circuits • Resistors in series and parallel • Analysing circuits • Internal resistance • Potential dividers • Practical applications	End of topic test	
Unit 7	Work, Energy and Power • Work done and energy • Conservation of energy • Kinetic energy • Gravitational potential energy • Power and efficiency	End of topic test	
Unit 8	Materials • Springs and Hooke's Law • Elastic potential energy • Deforming materials • Stress, strain and Young's Modulus	End of topic test	
Unit 9	Waves • Longitudinal and transverse waves • Wave features and properties • Polarisation • Intensity • Electromagnetic waves • Superposition of waves • Interference • Young's Double Slit • Stationary waves • Harmonics • Total internal reflection	End of topic test	
Unit 10	Quantum Physics • The photon model • The photoelectric effect • The photoelectric equation • Wave particle duality	End of topic test	
A2 Content			

Nobel

Year: 12 & 13

Subject: Physics

Unit 11	Circular Motion • Angular velocity and the radian • Angular acceleration • Centripetal forces	End of topic test	
Unit 12	Thermal Physics • Temperature • Solids, liquids and gasses • Internal energy • Specific heat capacity • Specific latent heat • Kinetic theory of gasses • Gas laws • Root mean square speed • The Boltzmann constant	End of topic test	
Unit 13	Capacitors • Capacitors • Capacitors in circuits • Energy and capacitors • Discharging capacitors • Charging capacitors	End of topic test	
Unit 14	Electric Fields • Electric fields • Coulomb's Law • Electric fields and capacitors • Charged particles and electric fields • Electric potential and energy	End of topic test	
Unit 15	Gravitational Fields • Gravitational fields • Newton's law of gravitation • Gravitational field strength • Kepler's Laws • Satellites • Gravitational potential • Gravitational energy	End of topic test	
Unit 16	Electromagnetism • Magnetic fields • Understanding magnetic fields • Charged particles in magnetic fields • Electromagnetic induction • Faraday's laws • Lenz's laws • Transformers	End of topic test	

Nobel

Year: 12 & 13

Subject: Physics

Unit 17	Astrophysics and Cosmology • Objects in the universe • Life cycle of stars • Hertzsprung-Russell diagrams • Energy levels in atoms • Spectra • Analysing starlight • Stellar luminosity • Astronomical distances • Doppler effect • Hubble's law • The Big Bang • Evolution of the universe	End of topic test	
Unit 18	Oscillations • Oscillations and simple harmonic motion • Analysing simple harmonic motion • Energy and simple harmonic motion • Damping and driving • Resonance	End of topic test	
Unit 19	Nuclear and Particle Physics • Alpha particle scattering • The nucleus • Anti-particles • Quarks • Beta decay • Radioactivity • Nuclear decay equations • Half life and calculations • Modelling radioactivity • Radioactive dating	End of topic test	
Unit 20	Medical Imaging • X-rays • Interaction of x-rays and matter • CAT scans • Gamma camera • PET scans • Ultrasound • Acoustic impedance • Doppler imaging	End of topic test	