Key Stage 5 Curriculum Overview

Subject: Physics

Year 12

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	Assessment
Particles & Radiation; Matter and radiation • Inside the atom • Stable and unstable nuclei • Photons • Particles and antiparticles • Particle interactions Waves & Optics; Waves • Waves and vibrations • Measuring waves • Wave properties • Stationary and progressive waves • Waves on strings • Oscilloscopes Electricity; Electric current • Current and charge • Potential difference and power • Resistance • Components and their characteristics	Particles and radiation; Quarks and leptons • The particle zoo • Particle sorting • Leptons at work • Quarks and antiquarks • Conservation rules Waves & Optics; Optics • Refraction of light • More about refraction • Total internal reflection • Double slit interference • Diffraction • Diffraction gratings Electricity; DC circuits • Circuit rules • More about resistance • EMF and internal resistance • Circuit calculations • Potential dividers	Particles and radiation; Quantum phenomena • Photoelectric effect • Photoelectricity • Collisions of electrons with atoms • Energy levels in atoms • Energy levels in spectra • Wave-particle duality Mechanics and materials; Forces in equilibrium • Vectors and scalars • Balanced forces • Moments • Stability • Equilibrium • Statics calculations Newton's laws of motion • Force & acceleration • Terminal speed • On the road • Vehicle safety Materials • Density • Springs • Deformation of solids • Stress and strain	Mechanics and materials; On the move • Speed and velocity • Acceleration • Motion along a straight line • Free fall • Motion graphs • Projectile motion Force & momentum • Momentum and impulse • Impact forces • Conservation of momentum • Elastic and inelastic collisions • Explosions Work, energy & power • Work and energy • Kinetic energy and potential energy • Power • Energy and efficiency	Revision; Particles & radiation Waves & optics Mechanics and materials Electricity	Revision; Particles & radiation Waves & optics Mechanics and materials Electricity	CPAC End of unit assessment PPQs homework

Key Stage 5 Curriculum Overview

Subject: Physics

Year 13

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	Assessment
Further mechanics & thermal physics Motion in a circle • Uniform circular motion • Centripetal acceleration • On the road • At the fairground Simple harmonic motion • Oscillations • Principles of SHM • Sine waves • Applications of SHM • Forced vibrations & resonance Thermal physics • Internal energy and temperature • Specific heat capacity • Change of state Gases • Experimental gas laws • Ideal gas law • Kinetic theory of gases	Fields; Gravitational fields • Gravitational field strength • Gravitational potential • Newton's law of gravitation • Planetary fields • Satellite motion Electric fields • Field patterns • Electric field strength • Electric potential • Coulomb's law • Point charges • Comparing electric & gravitational fields Capacitors • Capacitance • Energy stored in a charged capacitor • Charging and discharging a capacitor through a fixed resistor • Dielectrics	Fields; Magnetic fields • Current-carrying conductors in a magnetic field • Moving charges in a magnetic field • Charged particles in circular orbits Electromagnetic induction • Generating electricity • Laws of electromagnetic induction • AC generator • AC and power Nuclear physics; Radioactivity • Discovery of the nucleus • α, β, & γ radiation • dangers of radioactivity • radioactive decay • isotopes in use • decay modes • nuclear radius nuclear energy • energy and mass • binding energy • fission ad fusion • thermal nuclear reactor	Optional module Turning points in physics • discovery of the electron • wave particle duality • special relativity Revision Year 12 content; Particles & radiation Waves & optics Mechanics and materials Electricity Revision Year 13 content; Further mechanics and thermal physics Fields Nuclear physics	Revision Year 12 content; Particles & radiation Waves & optics Mechanics and materials Electricity Revision Year 13 content; Further mechanics and thermal physics Fields Nuclear physics Optional module		CPAC End of unit assessment PPQs homework