

## Key Stage 5 Curriculum Overview

**Subject: Physics**

**Year 12**

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	Assessment
<p>Particles &amp; Radiation; Matter and radiation</p> <ul style="list-style-type: none"> <li>• Inside the atom</li> <li>• Stable and unstable nuclei</li> <li>• Photons</li> <li>• Particles and antiparticles</li> <li>• Particle interactions</li> </ul> <p>Waves &amp; Optics; Waves</p> <ul style="list-style-type: none"> <li>• Waves and vibrations</li> <li>• Measuring waves</li> <li>• Wave properties</li> <li>• Stationary and progressive waves</li> <li>• Waves on strings</li> <li>• Oscilloscopes</li> </ul> <p>Electricity; Electric current</p> <ul style="list-style-type: none"> <li>• Current and charge</li> <li>• Potential difference and power</li> <li>• Resistance</li> <li>• Components and their characteristics</li> </ul>	<p>Particles and radiation; Quarks and leptons</p> <ul style="list-style-type: none"> <li>• The particle zoo</li> <li>• Particle sorting</li> <li>• Leptons at work</li> <li>• Quarks and antiquarks</li> <li>• Conservation rules</li> </ul> <p>Waves &amp; Optics; Optics</p> <ul style="list-style-type: none"> <li>• Refraction of light</li> <li>• More about refraction</li> <li>• Total internal reflection</li> <li>• Double slit interference</li> <li>• Diffraction</li> <li>• Diffraction gratings</li> </ul> <p>Electricity; DC circuits</p> <ul style="list-style-type: none"> <li>• Circuit rules</li> <li>• More about resistance</li> <li>• EMF and internal resistance</li> <li>• Circuit calculations</li> <li>• Potential dividers</li> </ul>	<p>Particles and radiation; Quantum phenomena</p> <ul style="list-style-type: none"> <li>• Photoelectric effect</li> <li>• Photoelectricity</li> <li>• Collisions of electrons with atoms</li> <li>• Energy levels in atoms</li> <li>• Energy levels in spectra</li> <li>• Wave-particle duality</li> </ul> <p>Mechanics and materials; Forces in equilibrium</p> <ul style="list-style-type: none"> <li>• Vectors and scalars</li> <li>• Balanced forces</li> <li>• Moments</li> <li>• Stability</li> <li>• Equilibrium</li> <li>• Statics calculations</li> </ul> <p>Newton's laws of motion</p> <ul style="list-style-type: none"> <li>• Force &amp; acceleration</li> <li>• Terminal speed</li> <li>• On the road</li> <li>• Vehicle safety</li> </ul> <p>Materials</p> <ul style="list-style-type: none"> <li>• Density</li> <li>• Springs</li> <li>• Deformation of solids</li> <li>• Stress and strain</li> </ul>	<p>Mechanics and materials; On the move</p> <ul style="list-style-type: none"> <li>• Speed and velocity</li> <li>• Acceleration</li> <li>• Motion along a straight line</li> <li>• Free fall</li> <li>• Motion graphs</li> <li>• Projectile motion</li> </ul> <p>Force &amp; momentum</p> <ul style="list-style-type: none"> <li>• Momentum and impulse</li> <li>• Impact forces</li> <li>• Conservation of momentum</li> <li>• Elastic and inelastic collisions</li> <li>• Explosions</li> </ul> <p>Work, energy &amp; power</p> <ul style="list-style-type: none"> <li>• Work and energy</li> <li>• Kinetic energy and potential energy</li> <li>• Power</li> <li>• Energy and efficiency</li> </ul>	<p>Revision; Particles &amp; radiation</p> <p>Waves &amp; optics</p> <p>Mechanics and materials</p> <p>Electricity</p>	<p>Revision; Particles &amp; radiation</p> <p>Waves &amp; optics</p> <p>Mechanics and materials</p> <p>Electricity</p>	<p>CPAC</p> <p>End of unit assessment</p> <p>PPQs homework</p>

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### Subject: Physics

### Year 13

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<p>Further mechanics &amp; thermal physics</p> <p>Motion in a circle</p> <ul style="list-style-type: none"> <li>Uniform circular motion</li> <li>Centripetal acceleration</li> <li>On the road</li> <li>At the fairground</li> </ul> <p>Simple harmonic motion</p> <ul style="list-style-type: none"> <li>Oscillations</li> <li>Principles of SHM</li> <li>Sine waves</li> <li>Applications of SHM</li> <li>Forced vibrations &amp; resonance</li> </ul> <p>Thermal physics</p> <ul style="list-style-type: none"> <li>Internal energy and temperature</li> <li>Specific heat capacity</li> <li>Change of state</li> </ul> <p>Gases</p> <ul style="list-style-type: none"> <li>Experimental gas laws</li> <li>Ideal gas law</li> <li>Kinetic theory of gases</li> </ul>	<p>Fields; Gravitational fields</p> <ul style="list-style-type: none"> <li>Gravitational field strength</li> <li>Gravitational potential</li> <li>Newton's law of gravitation</li> <li>Planetary fields</li> <li>Satellite motion</li> </ul> <p>Electric fields</p> <ul style="list-style-type: none"> <li>Field patterns</li> <li>Electric field strength</li> <li>Electric potential</li> <li>Coulomb's law</li> <li>Point charges</li> <li>Comparing electric &amp; gravitational fields</li> </ul> <p>Capacitors</p> <ul style="list-style-type: none"> <li>Capacitance</li> <li>Energy stored in a charged capacitor</li> <li>Charging and discharging a capacitor through a fixed resistor</li> <li>Dielectrics</li> </ul>	<p>Fields; Magnetic fields</p> <ul style="list-style-type: none"> <li>Current-carrying conductors in a magnetic field</li> <li>Moving charges in a magnetic field</li> <li>Charged particles in circular orbits</li> </ul> <p>Electromagnetic induction</p> <ul style="list-style-type: none"> <li>Generating electricity</li> <li>Laws of electromagnetic induction</li> <li>AC generator</li> <li>AC and power</li> </ul> <p>Nuclear physics; Radioactivity</p> <ul style="list-style-type: none"> <li>Discovery of the nucleus</li> <li><math>\alpha</math>, <math>\beta</math>, &amp; <math>\gamma</math> radiation</li> <li>dangers of radioactivity</li> <li>radioactive decay</li> <li>isotopes in use</li> <li>decay modes</li> <li>nuclear radius</li> </ul> <p>nuclear energy</p> <ul style="list-style-type: none"> <li>energy and mass</li> <li>binding energy</li> <li>fission and fusion</li> <li>thermal nuclear reactor</li> </ul>	<p>Optional module Turning points in physics</p> <ul style="list-style-type: none"> <li>discovery of the electron</li> <li>wave particle duality</li> <li>special relativity</li> </ul> <p>Revision Year 12 content; Particles &amp; radiation</p> <p>Waves &amp; optics</p> <p>Mechanics and materials</p> <p>Electricity</p> <p>Waves &amp; optics</p> <p>Mechanics and materials</p> <p>Electricity</p> <p>Revision Year 13 content; Further mechanics and thermal physics</p> <p>Electricity</p> <p>Revision Year 13 content; Further mechanics and thermal physics</p> <p>Fields</p> <p>Revision Year 13 content; Further mechanics and thermal physics</p> <p>Fields</p> <p>Nuclear physics</p>	<p>Revision Year 12 content; Particles &amp; radiation</p> <p>Waves &amp; optics</p> <p>Mechanics and materials</p> <p>Electricity</p> <p>Revision Year 13 content; Further mechanics and thermal physics</p> <p>Fields</p> <p>Nuclear physics</p> <p>Optional module</p>		<p>CPAC</p> <p>End of unit assessment</p> <p>PPQs homework</p>