

# Curriculum Map Year 12 Physics - AQA

Topic Name	Term	Skills developed with link to NC Subject content	Reflection on previous link in the curriculum	Progress to future link in the curriculum
<b>Particles and Radiation</b>	<i>Autumn HT1</i>	<b>Understanding of:</b> <ul style="list-style-type: none"> <li>• The structure of the atom, including stable and unstable nuclei.</li> <li>• Classifying particles into hadrons, leptons and quarks.</li> <li>• Antiparticles and Photons.</li> <li>• Strange particles and conservation laws.</li> <li>• Particle interactions.</li> </ul>	Year 10: Atomic structure <ul style="list-style-type: none"> <li>• The atom</li> <li>• Three types of radiation</li> </ul>	HT2: Electromagnetic Radiation and Quantum Phenomena. <ul style="list-style-type: none"> <li>• Energy levels in atoms</li> <li>• Wave-particle duality</li> </ul> Year 13: Radioactivity and nuclear energy. <ul style="list-style-type: none"> <li>• The atomic nucleus</li> <li>• Properties of nuclear radiation</li> <li>• Nuclear decay</li> </ul> Year 13: Gravitational, electric and magnetic fields. <ul style="list-style-type: none"> <li>• Electric fields effect on charge</li> <li>• Gravitational fields effect on mass</li> </ul> Year 13: Turning points <ul style="list-style-type: none"> <li>• Specific charge of an electron</li> </ul>
<b>Materials and GCSE transition</b>	<i>Autumn HT1</i>	<b>Understanding of:</b> <ul style="list-style-type: none"> <li>• Formula manipulation and substitution</li> <li>• S.I. units</li> <li>• Data manipulation and uncertainty</li> <li>• Density and volume</li> <li>• Hooke's Law</li> <li>• Young modulus, stress &amp; strain and brittle materials</li> <li>• Analysing graphs (stress - strain and force - extension)</li> </ul>	GCSE: equation manipulation and substitutions  Year 10: Particle model of matter <ul style="list-style-type: none"> <li>• Density</li> </ul> Year 11: Forces <ul style="list-style-type: none"> <li>• Hooke's law</li> </ul>	Year 13: Thermal physics <ul style="list-style-type: none"> <li>• Pressure of an ideal gas</li> </ul>
<b>Electromagnetic Radiation and Quantum Phenomena</b>	<i>Autumn HT2</i>	<b>Understanding of:</b> <ul style="list-style-type: none"> <li>• The photoelectric effect</li> <li>• Energy levels in atoms</li> <li>• Wave-particle duality</li> </ul>	Year 10: Atomic structure <ul style="list-style-type: none"> <li>• Energy levels</li> </ul> Year 11: Forces <ul style="list-style-type: none"> <li>• Momentum</li> </ul> Year 10: Waves <ul style="list-style-type: none"> <li>• Refraction &amp; wave structure</li> </ul> HT1: Particles and Radiation <ul style="list-style-type: none"> <li>• Atomic structure</li> </ul>	HT2: Waves <ul style="list-style-type: none"> <li>• Progressive waves</li> <li>• Superposition and interference</li> </ul> Year 13: Turning Points <ul style="list-style-type: none"> <li>• Discovering electrons (work done and eV)</li> <li>• Photoelectric effect</li> <li>• Wave-particle duality</li> </ul>
<b>Waves</b>	<i>Autumn HT2</i>	<b>Understanding of:</b> <ul style="list-style-type: none"> <li>• Progressive waves</li> <li>• Wave speed and the wave equations</li> <li>• Transverse and longitudinal</li> <li>• Superposition and interference</li> <li>• Polarisation, reflection, refraction and refractive index</li> <li>• Critical angle and TIR</li> <li>• Diffraction</li> <li>• Young's double-slit and diffraction grating</li> <li>• Stationary waves</li> </ul>	Year 10: Waves <ul style="list-style-type: none"> <li>• Describing and labelling waves</li> <li>• Longitudinal and transverse waves</li> <li>• Measuring wave speeds</li> <li>• Reflection and refraction, including wave fronts</li> <li>• The electromagnetic spectrum</li> <li>• Explaining the parts of the electromagnetic spectrum</li> <li>• Colour</li> </ul>	HT6: Further mechanics <ul style="list-style-type: none"> <li>• Circular motion</li> <li>• SHM</li> <li>• Free and forced vibrations</li> </ul> Year 13: Turning points <ul style="list-style-type: none"> <li>• Newton v Hygens (Young's double slit experiment)</li> <li>• Electromagnetic waves</li> </ul>

				Year 13: Astrophysics <ul style="list-style-type: none"> <li>• Lens diagrams in telescopes</li> </ul>
<b>Mechanics</b>	<i>Spring HT3</i>	<b>Understanding of:</b> <ul style="list-style-type: none"> <li>• Scalars and vectors</li> <li>• Forces in equilibrium</li> <li>• Centre of mass and moments</li> <li>• Uniform acceleration (suvat equations)</li> <li>• Displacement/velocity/acceleration - time graphs</li> </ul>	Year 11: Forces <ul style="list-style-type: none"> <li>• Speed and D-T graphs</li> <li>• Acceleration and V-T graphs</li> <li>• Equation of linear motion</li> </ul>	HT6: Further mechanics <ul style="list-style-type: none"> <li>• Circular motion</li> <li>• SHM</li> </ul>
<b>Electricity</b>	<i>Spring HT3</i>	<b>Understanding of:</b> <ul style="list-style-type: none"> <li>• Circuit symbols and key terminology</li> <li>• I-V graphs</li> <li>• Resistance of a wire and resistivity</li> <li>• Parallel, series circuits and Kirchoff's laws</li> <li>• Potential dividers</li> <li>• Internal resistance and e.m.f</li> </ul>	Year 10: Electricity <ul style="list-style-type: none"> <li>• Circuit symbols and drawing electric circuits</li> <li>• Electricity equations</li> <li>• Series and parallel circuits</li> <li>• Investigating circuits components</li> <li>• I-V graphs for fixed resistor, filament lamp and diode</li> <li>• The effect of length of a wire on resistance</li> <li>• Power and energy transfers</li> </ul>	Year 13: Turning points <ul style="list-style-type: none"> <li>• Discovering electrons</li> <li>• Specific charge of an electron</li> </ul> Year 13: Gravitational, electric and magnetic fields. <ul style="list-style-type: none"> <li>• Electric fields</li> <li>• Coulomb's law</li> <li>• Uniform and radial electric fields</li> <li>• Electric potential</li> </ul> Year 13: Capacitance <ul style="list-style-type: none"> <li>• Capacitors</li> <li>• Energy stored by capacitors</li> <li>• Charging and discharging</li> </ul>
<b>Mechanics</b>	<i>Spring HT4</i>	<b>Understanding of:</b> <ul style="list-style-type: none"> <li>• Projectile motion</li> <li>• Newton's laws of motion</li> <li>• Acceleration due to gravity</li> <li>• Drag, lift and terminal speed</li> <li>• Conservation of momentum</li> <li>• Force and impulse</li> <li>• Work, power and conservation of energy</li> </ul>	Year 11: Forces <ul style="list-style-type: none"> <li>• Forces and resultant forces</li> <li>• Newton's laws of motion</li> <li>• Weight and mass</li> <li>• Momentum</li> <li>• Road safety</li> <li>• Moments</li> <li>• Levers and Gears</li> </ul> Year 10: Energy <ul style="list-style-type: none"> <li>• Gravitational potential, kinetic and elastic potential energy</li> <li>• Work done and energy transfers</li> <li>• Power</li> </ul>	HT6: Further mechanics <ul style="list-style-type: none"> <li>• Circular motion</li> <li>• Centripetal force and acceleration</li> <li>• Simple harmonic motion</li> </ul> Year 13: Gravitational, electric and magnetic fields <ul style="list-style-type: none"> <li>• Gravitational fields</li> <li>• Gravitational field strength</li> <li>• Newton's law of gravitation</li> <li>• Gravitational potential</li> <li>• Gravitational potential energy and graphs</li> </ul>
<b>Learning recap and reflection</b>	<i>Spring HT4</i>	Recap and reflection on content learnt during the year Exam question focus Multiple choice question focus Scientific skills focus	Year 12: All previous learning  GCSE: Practical analysis skills	
<b>Learning recap and reflection</b>	<i>Summer HT5</i>	Recap and reflection on content learnt during the year Exam question focus Multiple choice question focus Scientific skills focus	Year 12: All previous learning  GCSE: Practical analysis skills	

<b>Further Mechanics</b>	<i>Summer HT6</i>	<b>Understanding of:</b> <ul style="list-style-type: none"> <li>● Circular motion</li> <li>● Centripetal force and acceleration</li> <li>● Simple harmonic motion</li> <li>● Simple harmonic oscillators</li> <li>● Free and forced vibrations</li> </ul>	Year 11: Forces <ul style="list-style-type: none"> <li>● Weight and mass</li> </ul> Year 10: Waves <ul style="list-style-type: none"> <li>● Time period and frequency</li> <li>● Wave equation</li> </ul> HT3 & 4: Mechanics <ul style="list-style-type: none"> <li>● Uniform acceleration (suvat equations)</li> </ul>	Year 13: Gravitational, electric and magnetic fields <ul style="list-style-type: none"> <li>● Orbits</li> <li>● Satellites</li> </ul>
<b>Nuclear Physics</b>	<i>Summer HT6</i>	<b>Understanding of:</b> <ul style="list-style-type: none"> <li>● The atomic nucleus</li> <li>● Nuclear radius and density</li> <li>● Properties of nuclear radiation</li> </ul>	Year 10: Atomic structure <ul style="list-style-type: none"> <li>● The atom</li> <li>● Three types of radiation</li> </ul>	Year 13: Nuclear Physics <ul style="list-style-type: none"> <li>● The atomic nucleus</li> <li>● Nuclear radius and density</li> <li>● Properties of nuclear radiation</li> <li>● Background radiation and intensity</li> <li>● Exponential law of decay</li> <li>● Nuclear decay</li> <li>● Mass defect and binding energy</li> <li>● Fission and fusion</li> <li>● Fission reactors</li> </ul>