

# GCSE Physics Curriculum Overview



## Curriculum Overview

Physics is an essential STEAM subject making links between maths, engineering, computing and technology. Studying physics helps us understand the world around us and the world beyond. We have planned an ambitious and broad curriculum that builds upon the key concepts from ks3, and transitions into the Advanced Level Physics. Studying Physics at GCSE and Advanced Level gives a greater understanding of Mechanics, Electronics, electric and magnetic fields, and nuclear and particle physics. Underpinning both KS4 and Ks5 physics is also the consideration of 'How Science Works' and topics to the relevance of physics in Society.

The aims and objectives of the physics curriculum are to enable students to develop:

- essential knowledge and understanding of different areas of physics and how they relate to each other
- and demonstrate a deep appreciation of the skills, knowledge and understanding of physics methods
- competence and confidence in a variety of practical, mathematical and problem-solving skills
- interest in, and enthusiasm for, physics, including developing an interest in further study and careers associated with the subject
- understanding of how society makes decisions about scientific issues linked to physics and how the sciences contribute to the success of the economy and society

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 9	<p>Energy Students will learn how energy stored in a system can change for example when the object is projected upwards or it hits an obstacle.</p> <p>Students will learn to calculate the amount of energy associated with a moving object, a stretched spring and an object raised above</p>	<p>Energy The topic of energy is continued. Student will learn about <b>Power</b> and link it to energy transferred or work done. Students will also learn how to use the power equations in calculations.</p>	<p>Energy Students will learn about <b>energy resources</b>, supply and demand, and the environmental impacts of supplying energy to homes and industry.</p>	<p>Electricity Students will learn about <b>Standard circuit diagram symbols</b> representing different electrical components. Students will also learn</p>	<p>Electricity in the home Students will learn about how electricity gets to our homes by learning about the <b>National Grid</b>. Students will also learn about <b>Energy transfers in everyday appliances</b> and</p>	<p>Consolidation of topics learnt this year. End of year assessments.</p>

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	ground level. Also how energy can be transferred from one form to another and efficiency of a system.	Students will learn about how <b>Temperature changes in a system</b> . Students will learn and be able to apply the equation for <b>specific heat capacity</b> .  <i>Core practical Specific Heat Capacity</i>		about <b>electric charge</b> and how the <b>current</b> of a component depends on the <b>resistance and potential difference</b> .  <i>Core practical's: Resistance and IV characteristics</i>	how <b>Static Electricity</b> can be formed.	
<b>Year 10</b>	Students will learn about the <b>particle models</b> and use it to explain the behaviour of <b>solids, liquids and gases</b> which are used in many everyday applications. Students will learn to apply and calculate the <b>density</b> of material.  ● <i>Core Practical Density.</i>	Students will learn about the sub atomic particles in the <b>structure of an atom, mass number and atomic number</b> . Students will extend this knowledge to learn about why <b>isotopes</b> exists. Also, why some nuclei give out radiation will also be learnt in <b>Radioactive decay and nuclear radiation</b> .	Students will learn about <b>scalar and vector quantities</b> , examples and how they can be represented.  Students will expand on their knowledge of forces by learning about <b>contact and non-contact forces, gravity and resultant forces</b> .  <i>Core practical- centre of mass.</i> ●	Students will expand their knowledge about Forces by studying motion. This will include plotting and analysing motion graphs.	Students will expand their knowledge about Forces by studying the topics from forces in motion. This includes forces and acceleration, weight, terminal velocity, braking and momentum.  <i>Core practical F=ma</i>	Students will be reviewing and consolidating what they have learnt so far. Students will sit year 10 exams on topics covered so far. Work experience.

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<b>Year 11</b>	<p>Students will learn about the different types of <b>waves</b>: <b>Transverse and longitudinal waves and Properties of waves.</b></p> <p>Students will learn about Light. Reflection, refraction, and diffusion of light. Lenses and using lenses.</p> <p><i>Core practical- Investigating waves in solids and liquids.</i></p>	<p>Students will expand on their knowledge of waves to learn about the <b>types of Electromagnetic wave, Properties of Electromagnetic Waves, Uses and applications of Electromagnetic waves.</b></p> <ul style="list-style-type: none"> <li>• <i>Core practical – IR radiation Leslie Cube</i></li> </ul>	<p>Students will also learn about <b>Magnetism and Electromagnetism: Permanent and induced magnetism, magnetic forces and fields, The motor effect.</b></p>	<p>Students will learn about <b>Space Physics.</b></p>	<p>Revision. Students will sit final exams.</p>	<p>Students will sit final exams.</p>

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Year 12	<p>Students will learn about the key skills required to be a <b>successful physicist</b>.</p> <p>Students will learn about <b>mechanics</b>. During this topic they will expand on their prior knowledge of forces, energy, power, moments and momentum.</p> <p><i>CORE PRACTICAL 1 - Acceleration of Freefall</i></p>	<p>Students will study the topic of <b>materials</b>. This topic will expand on their prior knowledge of Hooke's law, stress and strain.</p> <p><i>CORE PRACTICAL 4 - Falling Ball – viscosity</i></p> <p><i>CORE PRACTICAL 5 - Young modulus</i></p>	<p>Students will study the topic of <b>electricity</b>. This topic will expand on their prior knowledge of current, voltage, resistance and power. It will also build on their prior knowledge of series and parallel circuits.</p> <p><i>CORE PRACTICAL 2 - Resistivity</i></p> <p><i>CORE PRACTICAL 3 - EMF and internal resistance</i></p>	<p>Students will study the topic of <b>waves and the particle nature of light</b>.</p> <p><i>CORE PRACTICAL 6 - Speed of sound</i></p> <p><i>CORE PRACTICAL 7 - Frequency of vibrating string</i></p> <p><i>CORE PRACTICAL 8 - Diffraction grating</i></p>	<p>Revision.</p> <p>Students will sit final exams.</p>	<p>Students will sit final exams.</p> <p>Year 13 start: Students will build on their <b>mechanics</b> knowledge via the topic of <b>further mechanics</b></p> <p><i>Core Practical 9 - Force &amp; change in momentum</i></p> <p><i>Core Practical 10 - ICT to analyse collisions</i></p> <p>Students will study <b>space</b> and our universe.</p>
Year 13	<p>Students will learn about <b>nuclear and particle physics</b>.</p> <p>Students will then study <b>nuclear radiation</b>. This topic builds on students prior knowledge of radiation and the atom.</p> <p><i>CORE PRACTICAL 15 - Absorption of Gamma</i></p>	<p>Students will study the topic of <b>thermodynamics</b>.</p> <p><i>CORE PRACTICAL 12 - Calibrate a Thermistor</i></p> <p><i>CORE PRACTICAL 13 - Specific Latent Heat</i></p> <p><i>CORE PRACTICAL 14 - Boyles Law</i></p> <p>Students will study <b>gravitational fields</b>.</p>	<p>Students will build on their knowledge of <b>electricity</b> in the topic of <b>electric and magnetic fields</b>.</p> <p><i>CORE PRACTICAL 11 - Use a Datalogger for p.d v C</i></p>	<p>Students will study the topic of <b>oscillations</b>.</p> <p><i>CORE PRACTICAL 16 - Resonant Frequencies</i></p>	<p>Revision.</p>	<p>Students will sit final exams.</p>

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