

**Exam Board:** AQA  
**Qualification:** GCE Physics 7408  
**Assessment Information:** Paper 1 (chapter 1-13, 17-18), Paper 2 (chapters 19-27) and Paper 3 (practical skills & optional topic). Each exam is 120 minutes in length  
[Link to official specification](#)

**Department Information:**

*Physics, Biology and Chemistry are popular and successful subjects at Furze Platt. The Department aims to provide a supportive, stimulating, dynamic and academically challenging experience for all students. Over recent years, the Department has gone from strength to strength, and standards and students' results are high. In Year 13, those students studying the Physics A-level course will receive 9 hours of Physics teaching per fortnight.*

**ACHIEVE in the curriculum:**

*The curriculum has been designed with the ACHIEVE values at its core. Lessons have been written to encourage **ambition** and have also been written with the intent of being enjoyable and giving opportunities for students to celebrate their own successes. **Collaboration** is a key aspect of the scientific method and students will develop this and their **versatility** through required practical activities, as well as through paired and group classwork. Students will develop **integrity** through their completion of independent learning and through self-marking and peer-marking their work. Students will develop **endurance** through the completion of consolidatory activities such as past exam papers.*

**Curriculum Aims and Intent:**

*The AQA A-level Physics course aims to develop students' knowledge and understanding of physical principles, mathematical problem-solving skills, as well as their practical and analytical skills. The curriculum is designed to prepare students for higher education or careers in scientific fields while developing a passion for physics.*

- *Develop understanding of key physical concepts such as forces & motion, electrical circuits and waves*
- *Apply knowledge by equipping students with the ability to apply mathematical equations and physical laws to new and unfamiliar contexts, including problem-solving and decision-making.*
- *Enhance practical skills by promoting proficiency in practical and experimental skills through hands-on lab work, encouraging students to develop scientific inquiry, observation, and measurement skills.*
- *Develop analytical and critical thinking by fostering by interpreting data, analysing trends, and evaluating the reliability of information from experiments or secondary sources.*
- *Prepare for higher education and careers by laying the foundation for further study in physics, engineering, or related fields, and prepare students for scientific and non-scientific careers by developing transferable skills such as data analysis and problem-solving*
- *Instil a passion for Physics by cultivating a deeper interest in the Universe big and small.*

**Resources:**

- *Summer transition work: HeadStart to A-level Physics (CGP Guide) ISBN-13: 9781782942818*
- *Oxford University Press A-Level Biology textbook (available on Kerboodle and Amazon) ISBN-13: 978-0-19-835187-0*

- Kerboodle <https://kerboodle.com>
- PMT (for past paper questions) <https://www.physicsandmathstutor.com/physics-revision/a-level-aqa>
- Youtube: Science shorts, A-level Physics online

**How we keep parents informed:**

*Year 12 - Progress reports are published 4 times per year, in October, November and February, with a face-to-face parents' evening in December.*

**How parents can help their child:**

- *Ensure that students are consolidating their learning after every lesson. Students should be spending at least 9 hours per fortnight consolidating their learning with flash cards, completing set questions from the textbook*
- *Ensuring that students are actively engaged with their learning through the regular use of mind maps, flash cards, blurting etc.*
- *Encourage the completion and marking of past paper questions*
- *Encourage students to explore beyond the specification (documentaries, podcasts, reading of scientific journals, keeping abreast of scientific developments in the news)*
- *Liaise with teachers and attend Parents' evening*

**What we study and when:**

Term	Unit, Topic or Summary of Work Covered	Knowledge, Understanding & Skills Developed	ACHIEVE / Personal Development Focus	How The Work Is Assessed	Careers Links
1	Practical & Maths skills	Develop an understanding of and ability to apply: <ul style="list-style-type: none"> <li>• Designing practical methods</li> <li>• Drawing and analysing graphs</li> <li>• Calculating uncertainties</li> <li>• Estimating quantities</li> <li>• Using significant figures correctly</li> <li>• Using SI base units in Physics</li> </ul>		Throughout the course	

	<b>Ch4 Waves</b>	<p><b>Knowledge:</b> Students learn wave properties (wavelength, frequency, amplitude) and differences between transverse and longitudinal waves, including superposition, interference, diffraction, and polarization.</p> <p><b>Understanding:</b> Students explore wave interactions such as reflection, refraction, and diffraction, and understand conditions for interference and formation of stationary waves, and how to describe them using formulae</p> <p><b>Skills:</b> Students gain practical skills in measuring wave properties, using ripple tanks, and analysing waveforms with oscilloscopes. They solve practical problems using wave equations (<math>v=f\lambda</math>) and predict wave behaviour in various scenarios.</p>	<p>Collaboration: Students work together during required practical</p> <p>Versatility: Students apply basic concepts of waves to variety of different waves and scenarios</p>	<p>Ch4 end of topic test</p> <p>Assessed required practical 1</p>	<p>Acoustic engineer</p> <p>Seismology</p> <p>Medical physicist</p>
	<b>Ch10 Energy</b>	<p><b>Knowledge:</b> Students learn about different forms of energy, energy transfer, and the principle of conservation of energy. They explore kinetic, potential, thermal, and electrical energy, as well as work done and power.</p> <p><b>Understanding:</b> Students understand how energy is conserved and transferred between different forms. They explore energy efficiency, mechanisms like heat transfer, and concepts such as specific heat capacity and latent heat.</p> <p><b>Skills:</b> Students develop skills in calculating energy changes, work done, and power. They perform practical experiments to measure energy transfer, analyse efficiency, and apply equations such as those for kinetic energy, power, gravitational potential energy, and work done.</p>	<p>Versatility: Students apply basic concepts of energy to variety of different waves and scenarios</p>	<p>End of topic test</p>	<p>Mechanical engineering, aircraft and car design</p>
2	<b>Ch5 Optics</b>	<p><b>Knowledge:</b> Students learn about the behaviour of light, including reflection, refraction, diffraction, and dispersion. Key concepts include the nature of lenses, Snell's Law, optical fibres, critical angle, Young's double slit experiment and its implications in diffraction gratings</p>	<p>Collaboration: Students work together during required</p>	<p>End of topic test</p>	<p>Telecommunications engineer</p> <p>Optician / optical engineer</p>

		<p><b>Understanding:</b> Students understand how light interacts with different materials, forming images through lenses and mirrors. They explore the principles behind critical angle, total internal reflection, and interference patterns, as well as optical instruments like microscopes.</p> <p><b>Skills:</b> Students develop skills in using optical equipment, such as ray boxes and lenses, to investigate light behaviour. They perform calculations using equations like the double slit equation, and Snell's Law.</p>	<p>practical on diffraction</p> <p>Ambition: Students aim for a understanding to derive key equations of diffraction in the topic</p>		<p>Laser technician</p> <p>Research physicist</p>
	<b>Ch11 Materials</b>	<p><b>Knowledge:</b> Students learn about material properties, including density, elasticity, tensile strength, and ductility. They study stress, strain, Young's modulus, and the behaviour of materials under different forces.</p> <p><b>Understanding:</b> Students understand how materials deform under stress and the relationship between force, extension, and elastic potential energy. They explore concepts like Hooke's Law, plastic and elastic deformation, and the significance of stress-strain graphs.</p> <p><b>Skills:</b> Students develop skills in measuring material properties, conducting experiments to determine Young's modulus, and analysing stress-strain data. They use equations for stress and strain to solve problems related to material behaviour and evaluate material suitability for various applications.</p>	<p>Collaboration: Students work together during required practical on Young's modulus</p> <p>Ambition: Students aim for a understanding to link ideas from motion to materials</p>	<p>End of topic test</p> <p>Required practical 4</p>	<p>Civil engineering</p> <p>Materials Scientist</p>
<b>3</b>	<b>Ch1 &amp; 2 Particles and radiation</b>	<p><b>Knowledge:</b> Students learn about subatomic particles (protons, neutrons, electrons), fundamental forces, and particle interactions. They study the structure of the atom, isotopes, antimatter, and particle conservation rules</p> <p><b>Understanding:</b> Students understand concepts such as the strong nuclear force, weak interaction, and conservation laws in particle</p>	<p>Ambition: Students read outside the course to extend their understanding of particle</p>	<p>End of topic test</p>	<p>Particle physicist</p> <p>Nuclear medicine PET scans</p>

		<p>reactions. They explore the behaviour of particles in particle accelerators, pair production, annihilation.</p> <p><b>Skills:</b> Students develop skills in applying equations such as <math>E=hf</math> and <math>E=mc^2</math> to calculate photon energy and mass-energy equivalence. They analyse particle reaction equations, understand Feynman diagrams, and interpret experimental data from particle physics to identify particles and predict outcomes in interactions.</p>	physics and modern cutting-edge physics		
	<b>Ch 8 &amp; 9 Force and momentum</b>	<p><b>Knowledge:</b> Students learn about Newton's laws of motion, force types (friction, tension, normal), and momentum. Key concepts include impulse, conservation of momentum, and circular motion.</p> <p><b>Understanding:</b> Students understand how forces affect motion and apply Newton's laws to different scenarios. They explore collisions, both elastic and inelastic, as well as concepts like terminal velocity and equilibrium.</p> <p><b>Skills:</b> Students develop skills in calculating forces, acceleration, and momentum changes using equations such as <math>F = ma</math> and <math>p = mv</math>. They perform practical experiments to analyse motion, measure impulse, and verify the conservation of momentum in collisions.</p>	<p><b>Ambition:</b> Students apply their problem-solving skills to a variety of complex problems</p> <p><b>Collaboration:</b> Students work together when investigating momentum practical</p>	End of topic test	Civil and mechanical engineering
<b>4</b>	<b>Ch6 Forces in balance (statics)</b>	<p><b>Knowledge:</b> Students learn about different types of forces, such as gravitational, frictional, normal, tension, and centripetal forces. They study force diagrams, moments, and torque.</p> <p><b>Understanding:</b> Students understand how forces cause objects to accelerate, rotate, or remain in equilibrium. They explore conditions for static and dynamic equilibrium, analyse free-body diagrams, and apply the principle of moments and torque in various contexts.</p> <p><b>Skills:</b> Students develop skills in calculating resultant forces, moments, and torques using equations like <math>F = ma</math> and <math>\text{Moment} = Fd</math>. They perform experiments to measure forces, investigate equilibrium conditions, and solve problems involving inclined planes, levers, and circular motion.</p>	<p><b>Ambition:</b> Students apply their problem-solving skills to a variety of complex problems</p>	End of topic test	Civil engineering
	<b>Ch 3 Quantum Phenomena</b>	<p><b>Knowledge:</b> Students learn about quantum concepts such as the photoelectric effect, wave-particle duality, and energy levels in atoms. They study photons, electron emission, and phenomena like ionization and excitation.</p>	<p><b>Versatility:</b> Students can link ideas from the waves</p>	End of topic test	<p>Quantum physicist</p> <p>Quantum computing</p>

		<p><b>Understanding:</b> Students understand how light behaves as both a wave and a particle, and explore the significance of the photoelectric effect in demonstrating quantum theory. They learn about the quantization of energy and how electrons transition between energy levels, emitting or absorbing photons.</p> <p><b>Skills:</b> Students develop skills in applying equations <math>hf = 0 + E_{kmax}</math> to calculate photon energy and wavelength. They analyse experimental data, interpret results of the photoelectric effect, and solve problems involving energy levels and photon interactions with matter.</p>	<p>topic and particles topic</p> <p>Ambition: Students read outside the course to extend their understanding of quantum phenomena</p>		
5	Ch7 Motion	<p><b>Knowledge:</b> Students learn about concepts like SUVAT equations, the independence of vertical and horizontal velocity components, and the impact of air resistance of trajectory paths Students learn about distance-time, velocity-time, and acceleration-time graphs, and what can be calculated from them</p> <p><b>Understanding:</b> Students understand how to apply equations of motion to various different scenarios</p> <p><b>Skills:</b> Students problem solving skills to apply equations of motion to different scenarios, as well as practical skills when completing free-fall practical to determine the acceleration due to gravity</p>	<p>Collaboration: Students work together during required practical on acceleration due to gravity</p> <p>Ambition: Students aim to solve the trickiest problems involving equations of motion involving angle</p>	<p>End of topic test</p> <p>Required practical 3</p>	Civil and mechanical engineering
	Ch12 & 13 Electricity	<p><b>Knowledge:</b> Students learn about concepts like Kirchhoff's laws in electrical circuits, various electrical formulae, internal resistance and EMF, potential dividers, component characteristics, resistivity.</p>		End of topic test	<p>Electrical engineering</p> <p>Appliance design</p>

		<p><b>Understanding:</b> Students can understand how to apply electrical circuit laws to a variety of complex circuits, and how to calculate key quantities such as resistivity and internal resistance in a circuit</p> <p><b>Skills:</b> Students problem solving skills to apply circuit laws and equations to different scenarios, as well as practical skills when finding the internal resistance of a cell, and resistivity of a wire</p>		Required practical 5 and 6	
6	Revision to prepare for PPEs	<ul style="list-style-type: none"> <li>• Past paper practice</li> <li>• Required practical re-cap</li> <li>• Definitions and key concepts from the year</li> </ul>	<p>Endurance: Students complete various revision activities, past papers and similar tasks both for independent learning and in class</p> <p>Ambition: Students walked through the hardest types of questions needed to obtain the highest grade</p>		