

KS5 Science - Physics

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Curriculum Intent:

Science has massive impact on society and is vital to the world's future prosperity. At Forge Valley all pupils are taught to appreciate the achievements of science and to develop their curiosity and excitement about the natural world.

We aim to provide all pupils with a high challenge, high-quality science education that provides the foundations for understanding the world through the specific discipline of Physics. We will do this by embedding a culture of confidence and mastery underpinned by scientific enquiry and by building up a body of key foundational knowledge and concepts. Pupils will be encouraged to understand how science can be used to explain what is occurring, predict how things will behave, analyse causes, as well as to develop their ability to see connections between science subject areas. Our pupils will develop an in depth understanding of the world around them and will appreciate how major scientific ideas have played a vital role in society, preparing them for life in an increasingly scientific and technological world.

	Core Knowledge	Procedural Knowledge
	Topic	Pupils will
Autumn Half-Term 1	Y12 Physics: 2.1 Physical quantities and units 2.2 Making measurements and analysing data 2.3 Nature of quantities 3.1 Motion 3.2 Forces in action 3.3 Work, energy and power Y13 Physics: 5.1 Thermal physics 5.2 Circular motion	- Demonstrate knowledge and understanding of scientific ideas, processes, techniques and procedures. - Apply knowledge and understanding of scientific ideas, processes, techniques and procedures: - in a theoretical context - in a practical context - when handling qualitative data - when handling quantitative data. - Analyse, interpret and evaluate scientific information, ideas and evidence, including in relation to issues, to: - make judgements and reach conclusions - develop and refine practical design and procedures
Autumn Half-Term 2	Y12 Physics: 3.4 Materials 3.5 Newton's laws of motion and momentum Y13 Physics: 5.3 Oscillations	

	• 5.4 Gravitational fields	
Spring Half-Term 1	Y12 Physics: • 4.1 Charge and current • 4.2 Energy, power and resistance • 4.3 Electrical circuits Y13 Physics: • 6.1 Capacitors • 6.2 Electric fields • 6.3 Electromagnetism	
Spring Half-Term 2	Y12 Physics: • 4.4 Waves Y13 Physics • 6.4 Nuclear and particle physics • 6.5 Medical imaging	
Summer Half-Term 1	Y12 Physics: • 4.5 Quantum physics Y13 Physics: • Revision and exam preparation	
Summer Half-Term 2	Y12 Physics: • Revision and exam preparation	

Homework:
Weekly homework will be set that will take a total of 5 hours per week. This will usually be a booklet of exam questions and end of topic quizzes on topics recently covered to consolidate understanding and to develop exam technique, or preparation/write ups for a required practical. Students will also be expected to use some of this time to work independently to decide which topic areas they need to consolidate by identifying gaps in understanding using their PLC.

Assessment:
Overview of A Level in Physics A (H556)
Content is split into six teaching modules:
Module 1 - Development of practical skills in physics

Module 2 Foundations of physics
 Module 3 – Forces and motion
 Module 4 – Electrons, waves and photons
 Module 5 – Newtonian world and astrophysics
 Module 6 – Particles and medical physics

Paper 1 assesses any content from topics 1–4, including relevant practical skills
 Paper 2 assesses any content from topics 5–8, including relevant practical skills
 Paper 3 assesses any content from topics 1–8, including relevant practical skills

Practical competencies are assessed through 6 required practical groups in Y12 and 6 required practical groups in Y13. A broad range of skills will be assessed which will lead to an additional practical endorsement alongside their subject grade.

Paper 1: Modelling physics (01) 100 marks 2 hours 15 minutes written paper 37%
 Paper 2 : Exploring physics (02) 100 marks 2 hours 15 minutes written paper 37%
 Paper 3: Unified physics (03) 70 marks 1 hour 30 minutes written paper 26%

Links to Personal Development:

- Risk assessments: Enabling students to recognise risks to their own wellbeing.
- Social development: Practise using a range of social skills in different situations.
- Teamwork and communication: Completing some tasks in pairs/groups whereby students will need to work together and communicate their knowledge
- Problem-solving and critical thinking: Analysing experimental data, identifying patterns, and evaluating whether evidence truly supports a scientific conclusion. Applying memorised facts to unseen, real-world physics and engineering situations, often utilising multi-step calculations, statistics, or logical deduction.
- Diversity: Opportunities to recognise the contributions that physicists from a range of backgrounds have contributed to the knowledge base that we use today
- Careers: Linking topic areas to the wide range of careers and academic pathways that physics can lead towards

How is my knowledge further developed post-KS5?

The OCR A-level Physics A course is designed not only to help students succeed in examinations, but also to provide the knowledge, practical skills and analytical thinking needed for university study. The specification was developed in consultation with universities so that students develop the skills expected in higher education and are well prepared for degree courses related to health care and medicine, as well as environment and ecology.

We place practical work at the heart of the course, requiring students to complete a range of practical activities and develop competence in laboratory techniques.

Students learn to:

- Use scientific equipment safely and accurately
- Collect and process experimental data
- Draw evidence-based conclusions

These skills are essential for university laboratory courses and research projects.

Students are regularly required to:

- Apply knowledge to unfamiliar situations
- Analyse, interpret and evaluate scientific information, ideas and evidence, including in relation to issues, to:
 - make judgements and reach conclusions
 - develop and refine practical design and procedures.

These higher-order thinking skills mirror the style of learning and assessment found at university, where students must often solve problems independently rather than simply recall facts.

The breadth and depth of the A-level encourage students to:

- Manage their own revision and study time
- Read beyond the specification
- Link concepts across different areas of physics
- Develop resilience when tackling challenging material

These habits help students adapt to the greater independence expected in higher education.