



A Level Physics

KS5 Leader: Mr J Hutchins • Exam Board: OCR

Course Entry Requirements:

GCSE Grade 5 in Mathematics and GCSE Level 55 in Combined Science/GCSE Level 5 in Physics. (Students achieving a grade 7 in GCSE Mathematics and/or taking A-Level Mathematics will find the course easier due to its numerical content, but a higher level 5 is the required minimum).

Course Outline:

Physics has been at the heart of some of the most important technological advances in our society – the development of computers and digital communications for example. It is also concerned with answering the big questions in life – where do we come from, how did the universe begin? Physics is the subject that fits between Mathematics and Science so if you like Maths you'll enjoy Physics too. The major topics studied include Motion, Car Safety, Electricity, Waves, Energy, Radioactivity, Gravity, Oscillations, Quantum Physics and Astronomy.

Physics A Level content is split into six teaching modules. The modules can be summarised as:

- Development of practical skills. This includes skills of planning, implementing, analysis and evaluation
- Foundations of physics. This includes physical quantities and units, scalars and vectors & measurements.
- Forces and motion. This includes motion, forces in action, work, energy and power, materials, Newton's laws of motion and momentum.
- Electrons, waves, and photons. This includes: charge and current, energy, power and resistance, electrical circuits, waves & quantum physics.
- Newtonian world and astrophysics. This includes thermal physics, circular motion, oscillations, gravitational fields & astrophysics.
- Particles and medical physics. This includes capacitors, electric fields, electromagnetism, nuclear and particle physics & medical imaging.

Assessment:

Paper 1 (135 minute exam) 100 marks 37% of final grade

Modelling physics:

Multiple choice, 15 marks

Structured questions, covering theory and practical skills, 85 marks

Paper 2 (135 minute exam) 100 marks 37% of final grade

Exploring physics:

Multiple choice 15 marks

Structured questions, covering theory and practical skills. 85 marks.

Paper 3 (90 minute exam) 70 marks 26% of final grade

Unified physics:

Structured questions and extended response questions covering theory and practical skills.

- 40% of A level assessment requires mathematics at or above level 2. Where new mathematical techniques are required beyond top grade GCSE, this will be taught as part of the course.
- Finally practical skills are also assessed for the full A level qualification. This is done by a pass/fail non-exam assessment which is reported separately. This consists of a teacher assessed practical profile developed throughout the course. Candidates complete a minimum of 12 practical activities to demonstrate practical competence. Performance is reported separately from the A Level grade.



Learning strategies:

- Decision making, role plays and data analysis
- Laboratory work
- Homework including examination questions and research
- Self-study using school resources
- Presentation assignments (individual and group) including use of ICT
- Active engagement in enquiry into problems, issues and questions
- Group discussions
- Out of School visits and lectures
- Work for lessons and other activities is posted on the school's VLE for students
- In September we visit the Physics At Work exhibition at the Cavendish Laboratories at the University of Cambridge and in the spring of the A2 year we visit CERN, the European Centre for Nuclear Research in Switzerland which supports the work we do on particle physics. Also, the University of Cambridge Physics Centre hosts evening lectures every month from October to March for students of A level physics. These aim to use the students' existing knowledge to stretch and challenge their understanding. Last year's topics included Space, Dark matter, Large Hadron Collider, Engineering, Energy Mathematics and the Element Polonium 210. We also attend the yearly Science Live: A-Level Physics events in London.
- Students are expected to carry out self-study activities during study periods to support their studies. These activities will be actively monitored in school