

IB Physics HL and SL

As the most fundamental of the sciences, physics incorporates a range of topics that allow the students to study scales from the microscopic to the macroscopic. It attempts to explain observations from the natural and physical world in terms of laws and theories relating to matter and energy. Students will also discover some of the important historical discoveries and the international aspects of the subject. It is designed to give a holistic view of physics and help to see the relevance of the subject in our rapidly changing world. This is achieved through theory, practical investigations and student research. This includes the 'Group 4 Project' in collaboration with those studying biology, chemistry and design technology. Investigative, research, numerical and conceptual skills will be challenged throughout. This course gives the students a good foundation for a wide range of university courses including medicine, engineering and the physical sciences.

Content

The core comprises the following topics (* HL only).

- Measurements and Uncertainties
- Mechanics
- Thermal Physics
- Waves
- Electricity and magnetism
- Circular motion and gravitation
- Atomic, nuclear and particle physics
- Energy production
- Wave Phenomena*
- Fields*
- Electromagnetic Induction*
- Quantum and nuclear physics*

One option will be studied by both the HL and SL students and available topics include:

Relativity, Engineering Physics, Imaging or Astrophysics

Assessment

The course is examined through three written papers contributing a total of 80% of the final grade. The papers cover a range of multiple-choice, structured and extended response questions. The remaining 20% of the marks come from assessment of a pupil's investigative skills culminating in a final written project and during the Group 4 project.



Three written papers



Investigation culminating in
written project



A Level Physics

Exam Board: AQA

The A Level Physics course provide an excellent basis for Sixth form students wishing to experience the fundamental processes of the natural world in a little more detail than GCSE level. It provides the ideal basis for those intending to pursue a science related career or university course. Completing the A level is necessary for those intending to undertake physics or engineering at degree level, as well as being a good science A Level for those considering medically related courses at university. The A Level course encourages the kind of thought processes essential to potential careers in engineering and the sciences. It can also provide an excellent education for students who wish to study the subject for further academic stimulation. The course involves a degree of 'learning by doing' and so incorporates interesting and stimulating practical work.

Typical Course Content

In Year 12 pupils will cover the following topics:

- Measurements and their Errors e.g. S.I. units, uncertainty calculations, use of error bars
- Particles and Radiation e.g. Radioactivity, Particle families, Particle interactions
- Waves e.g. Wave superposition, Diffraction patterns, Simple Harmonic Motion
- Mechanics and Materials e.g. Newton's laws and momentum, Young's Modulus
- Electricity e.g. Kirchoff's Laws, Ohm's Law, Series and Parallel circuits

In Year 13 pupils will cover these additional topics, as well as being assessed on their skills in practical work:

- Further Mechanics and Thermal Physics e.g. circular motion, oscillations and ideal gases
- Fields and their Consequences e.g. Magnetic, Electric and Gravitational fields
- Nuclear Physics e.g. Nuclear stability, mass-energy conversion
- Engineering Physics

Assessment

Exams at the end of the Upper Sixth will include questions that encompass the entirety of the two year course. In addition to the exams, candidates will complete 12 practical skill assessments throughout the two years.

