

A level Physics at

The Polesworth School
ENSURING EXCELLENCE



What does studying Physics involve?

We are all born with the urge to understand the world around us. Our enquiring minds often ask the questions 'Why?' and then later 'How?'. The study of physics deals with answering these sorts of questions.

Physics is concerned with observing the natural phenomenon and man-made systems in the world around us, trying to understand them and predict what might happen in new and unknown situations. Physics deals with profound questions about the nature of the universe and with some of the most important practical, environmental and technological issues of our times. It is also a creative subject, with the ideas and techniques from physics driving developments in related subject areas including chemistry, computing, engineering, materials science, mathematics, medicine and meteorology.

Studying physics will bring lots of knowledge and skills that are also valuable outside of physics: practical skills such as a practical approach to problem solving, the ability to reason clearly and communicate complex ideas, the facility to use ICT and self-study techniques, developing mathematical skills.

How will I know if I will be good at it?

Physics is ideal for students who have an interest in the world around us and how things work. Sound background knowledge in mathematics is essential. About 40% of the total marks in A-level Physics exams will require the use of mathematical skills.

Examinations

All exams are taken at the end of the two-year course, for physics this is three 2-hour papers. There is no coursework module however there are a series of practical experiments which pupils will complete over the 2-year course and these may be assessed in the paper 3 exam.

Entry Requirements

Students must achieve at least a Grade 6 in Maths and also a minimum of a 65 in Combined Science or if Triple Science is taken, a grade 6 in Physics with a grade 5 in either Biology or Chemistry.

Students should be aware that Physics is an academically demanding subject and a willingness to work hard is essential. Students will be expected to complete at least 3 hours of independent work per week.

Exam Board

AQA Physics Syllabus A

Will I need Physics for my Career?

Engineering at university will require Physics in most cases. If you intend to study Physics, Electronics or other closely related subjects, Physics will be essential.

However, students with Physics A level are particularly sought after, as they are in high demand. For example, many medical schools and business/economics departments appreciate the abilities that Physics A level students have and look upon such students as favourable.



Contents

Paper 1

2-hour exam – 85 marks (60 short and long answer Qs and 25 MCQ)

34% of A level

Topic list:

- The nucleus including particles, antiparticles and photons; hadrons and leptons; the quark model.
- Quantum phenomena including photoelectricity, energy levels and photon emission, wave particle duality.
- Electricity including electrical quantities, resistivity, circuits and components, alternating current.
- Mechanics, including motion along a straight line, projectile motion, Newton's laws of motion, energy and power.
- Properties of materials, including density and the Young modulus.
- Waves, including longitudinal and transverse waves, progressive and stationary waves, refraction, diffraction and interference.
- Further mechanics, including momentum, circular motion and simple harmonic motion

Paper 2

2-hour exam – 85 marks (60 short and long answer Qs and 25 MCQ)

34% of A level

Topic list:

- Fields, including gravitational fields, electric fields, capacitors, magnetic fields, electromagnetic induction.
- Probing the nucleus, radioactivity, nuclear instability and nuclear energy.
- The thermal properties of materials, ideal gases and the kinetic theory of gases.

Paper 3

2-hour exam – 80 marks (45 practical questions, 35 on optional topic)

32% of A level

Practical skills:

- Selection and use of various equipment
- Processing of data,
- Making observations and measurements,
- Analysing and evaluation of results.

Option Units: This section will provide students and teachers with opportunities to develop deeper knowledge and understanding in one chosen area of the subject.

The options are:

1. Astrophysics: lenses and telescopes, non-optical telescopes, classification of stars, cosmology.
2. Medical Physics: physics of the eye, physics of the ear, biological measurements, non-ionising imaging, X-ray imaging.
3. Engineering Physics: rotational dynamics, thermodynamics, engines.
4. Turning points in physics: the discovery of the electron, wave-particle duality, special relativity.
5. Electronics: Discrete semi-conductor devices, analogue and digital signals and processing, operational amplifiers, data communication systems.