

PHYSICS

Qualification: A-Level | Exam board: OCR



SUBJECT OVERVIEW

There has never been a better time to study physics. We are at the beginning of our understanding of dark matter and dark energy, the Large Hadron Collider (LHC) has already discovered the Higgs Boson, and we expect more amazing discoveries from the LHC in the next few years.

As a result, models in physics may be re-written, which will change our understanding of nature and the origins of the universe.

An A-Level in Physics will open up a broad range of career possibilities, whether in industry, research or even pushing the boundaries of our understanding of nature. If you are a confident mathematician, enjoy

practical work, have an enquiring mind and want to know more about how the world works, then A-Level Physics may be just for you.



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YEAR ONE COURSE CONTENT

Development of Practical Skills in Physics

A broad range of practical sessions will be undertaken which will cover the majority of the concepts taught in the course. Your skills will be tested by undertaking six formal practical exercises at key points during the year.

Foundations of Physics

You will examine and be able to explain the need for different quantities and their units in conjunction with developing your abilities in estimation. You will also master the use of equations of motion and their application to a variety of situations including projectiles and objects in freefall.

Forces and Motion

You will apply your existing mathematical knowledge and some new mathematical techniques to the motion and the forces acting on everyday objects such as bridges, cars and aircraft. On completion of this unit you will have mastered the fundamental mathematical ideas that underpin the function of speed cameras and safety features in cars. Practical activities as well as theory lessons will enable you to visualise how physics works in a range of different situations.

Electrons, Waves and Photons

This unit will introduce ideas related to waves, electromagnetism and quantum physics through practical work, demonstrations and study of theory. You will develop knowledge, understanding and skills that can be applied to new situations, building your confidence to address the more challenging concepts. The concept of electricity through to practical electric circuits and basic concepts of waves through to the particle nature of waves will all be covered in this course.

YEAR TWO COURSE CONTENT

The second year will build on the learning from year one in the following areas:

Development of Practical Skills in Physics 2

Building on your skills from the first year, this unit will include a more advanced range of practical work that will enable you to further hone your practical skills. You will undertake another six formal practical experiments to complete a logged programme of practical work.

When you complete all practical assignments you will be eligible for a practical endorsement as well as being fully prepared for practical related questions in the theory examinations.

Newtonian World and Astrophysics

You will develop a deeper understanding of mathematical physics by studying Newton's Laws in more detail. Exploring the ideas of momentum and gravitation and relating to theory you have already mastered, you will develop a richer understanding of the fundamental concepts of motion and to understand

how satellites work and why time isn't the same for everybody. A new way of looking at the behaviour of

WHAT DOES THIS COURSE PREPARE ME FOR?

An A-Level in Physics will open doors to many science and non-science careers. Employers are always looking for numerate employees and university science courses rate a physics qualification highly.

Typical degree courses a student may go on to study include: physics, astronomy, astrophysics, computer science, IT or gaming technology, electronic engineering, materials science, architecture, mathematics, and several areas of engineering. Some of these courses may require particular combinations of physics and other subjects.

COURSE SUPPORT AND ENRICHMENT

Annual trips are organised to a variety of possible destinations. In the past this has included visits to the British Science Museum and the nuclear fusion research establishment in Culham, Oxfordshire.

You will also be made aware of the frequent external lectures organised by the Institute of Physics in Bedford and the Open University in Milton Keynes.

ASSESSMENT

There will be three papers at the end of the second year that will examine your knowledge of the whole course leading to an A-Level qualification.

These papers will also test your knowledge of practical work. There will be an initial assessment test at the beginning of the course to establish whether you will need to practice some particular skills essential to achieve your potential at A-Level.

As a result, you may also be asked to attend a science support course to bring you up to speed in relevant topics.

Updated: October 2021