

Physics

Awarding Body: AQA

Level: A-Level

Introduction

Physics is the study of nature; it aims to understand particles, energy, forces and fields on both the smallest and largest scales, from the interaction of the smallest particles yet discovered to the way the Universe has evolved since the beginning of time. Alongside these fundamental aspects, we will also cover topics more relevant to our daily lives and see how Physics underpins much of the technology we have come to rely on in the modern world, and has inspired the digital revolution.

Physics teaches you transferable skills and allows you to approach new situations with a variety of problem-solving skills, which is why it can lead to such a huge range of careers. Many of the challenges facing society today will be solved by people who have Physics training, whether it is in solving the energy crisis, climate change or developing new treatments for disease, Physics can equip you to take on these enormous tasks. Much of the technology we rely upon today evolved directly from discoveries made by Physicists, and so the study of more fundamental Physics such as the particle model or astrophysics could yet lead to unimagined solutions to some of today's problems. If you would like to know more about the nature of the Universe and develop skills that will help you to forge a career that can make a difference to others then Physics is a fantastic choice.

Content included within the two years:

Your study will look at many aspects of Physics that develops further topics learned at GCSE:

YEAR 1

In the first year, we begin by studying how Physicists make measurements of the natural world, and consider the uncertainties and errors associated with these measurements. We will look at the fundamental particles and forces that our Universe is made of, and how those particles interact. We will go on to look at wave behaviour, materials and how objects move, as well as increasing our understanding of electricity from GCSE level.

YEAR 2

In Year 2 we will continue to look at motion in more detail. We will study thermodynamics and gas laws, as well as the molecular kinetic theory model. We will also cover uniform and nonuniform fields, both electric and gravitational and see how these fields dominate the landscape of the Universe on both the small and large scale. We will then consider electromagnetic machines and electrical components in order to begin to understand the technologies that are ubiquitous in the modern world.

In addition there will be an optional topic, where the class will take one topic from: *Medical physics, Engineering, Astrophysics, Turning points in physics, Electronics*

Final Assessment

The A -Level consists of the following examinations, which all last for 2 hours:

- Paper 1 – Regular & multiple choice questions about **Year 1 content** (34% of the final grade)
- Paper 2 – Regular & multiple choice questions about **Year 2 content** (34%)
- Paper 3 – Mixture of questions on **practical experiments / analysis + optional topic** (32%)

Required practical investigations

We will be carrying out a minimum of 12 assessed practical investigations throughout the year, where you will need to demonstrate key skills: Following a method closely, using initiative, recording and analysing results, carrying out a practical in a safe manner, research and referencing.

These criteria are either pass or fail, and students need to complete the practical activities well to obtain a practical endorsement for the course.

What you need

To gain entry onto the course, you need to achieve:

- at least a grade '5' in your Physics GCSE, or two '5' grades in Combined Science
- at least a grade '5' in Mathematics GCSE

Career and further study

Physics A-level is one of the most respected courses for any University application, particularly for Oxbridge and Russell group universities. Physics, along with Mathematics, has the highest number of degrees that deem it "essential" to study.

This course is an excellent foundation (and indeed essential) for further study of Physics, astrophysics, a whole range of engineering degrees, medical physics and medicine. The problem solving skills you will

develop in Physics could lead to careers in all sorts of areas such as research and development, design, sustainable energy, telecommunications, meteorology, law, finance, media technology, computer gaming design, transport and education.

A Physics A-level opens up a whole new world of career opportunities, and many of these jobs have not even been invented yet! It is estimated that over half of all new jobs will be related to STEM (Science, Technology, Engineering & Maths) subjects, you will make yourself employable all over the world.

Trips and other costs

The new textbook for the 2-year course can be brought from the Science Department for £31. Alternatively there are usually second-hand copies available from previous students.

Three-day trip to Geneva planned for Spring 2023 to visit CERN and other local attractions – approximately £400.

One planned trip to a local destination, for example Culham science centre or Diamond Light Source (places dependent) – free.