Elevate 11 – A-level Physics

Welcome to A-level Physics! Over the course of the next two years you will be studying the inner workings of… well… pretty much everything – from the tiniest particle to the Universe itself. Physics is all about why things do what they do, how matter and energy interact. We seek not only to study the phenomena we witness, but also to model them through experimental observations and to attempt to gain an understanding of the physical world. While it is an advantage to study A-level Maths alongside Physics, as long as you are very confident with your GCSE work you will not be limited.

The most important thing you can do before starting the A-level course is to ensure you are as confident with your GCSE Maths and Physics knowledge and skills as you can be. A lot of content will build on what you have learned at GCSE and having this knowledge at the forefront of your mind will make it much easier for you to access the new material. This is especially important for any topics you may not have been assessed on at GCSE, as you will need this knowledge on the A-level course.

Advice on choosing A-level Physics from the Institute of Physics

Recommended reading

- Six Easy Pieces: Essentials of Physics explained by its Most Brilliant Teacher – Richard Feynman
- Black Bodies and Quantum Cats: Tales of Pure Genius and Mad Science – Jennifer Ouellette
- A Short History of Nearly Everything – Bill Bryson

The following tasks will give you a taste of what A-level Physics is like, and will get you off on the right foot with your studies:

Task 1

Over the summer, you should access the A-Level Physics Online Daily Physics Workout and attempt the free month. These questions will give you the chance to test your mathematical skills as well as some simple applications from your GCSE. Mark schemes and worked solutions are included so you can self-assess. We will expect to see evidence of your attempts. If you wish to purchase the other books in the series, they are £9.99 for the set, but this is completely up to you.

Task 2

As part of your course, you will be undertaking a practical competency assessment, which will stand alongside your final grade. In order for you to understand the criteria you will be assessed against, you should take the AQA CPAC training course, using centre number 13337. While it is designed for teachers rather than students, it will give you a better understanding of what we will be looking for when assessing your practical work, and give you a better chance of passing the CPAC. You should print or screenshot your certificate and have this at your first session. If you have been asked to do this for another Science, you will only have to do this once.

Task 3

Alongside your studies, you should be looking for opportunities to expand on what we do on the course by external reading and public lectures. You should take a look at the Oxford Department of Physics YouTube channel and watch some of their public lectures on fields of Physics that interest you. The Hintze Lectures are aimed at A-level students, but some on there may be aimed much higher so ensure you can follow the content. If you can find any other lectures, online or in person, that interest you, please make the effort to attend them

Task 4

As part of your taster session, you will be working with A-level standard electric circuits, performing one of your required practicals from GCSE – I-V characteristics of a filament lamp. You should familiarise yourself with the basics of this experiment, either from your own notes or using the GCSE Required Practical Handbook (practical can be found on P46)

Optional Task

We will be looking for teams to enter the Weizmann Institute Safe Cracking Competition, which involves designing and building a safe locking mechanism based on simple physics principles. As the deadline for entry is particularly early, I will be looking for students to have an idea as to whether they want to take part within the first week of term. Have a look at the linked document outlining the requirements for the competition and have a think about what ideas you could bring to the table.