SPRINGBOARD

A-Level Physics

OUR COURSE DETAILS

Statement of intent: As a teaching team we aim to introduce our students to all the interesting and important ideas in the Physics A-level course and give many opportunities to deepen their learning and see how to apply these ideas to real situations, including modern technologies and practical investigations. We also aim to develop their study skills and ability to show their understanding in examinations so that they may achieve the grades to successfully progress onto higher education or careers.

We have chosen to follow the AQA specification 7408 as it is written in a context-free style whilst still allowing great scope for applying the concepts learned to different technology or applications and embedding practical work that is vital to a full understanding of the physical meaning of the values we deal with. It is also written deliberately to allow a variety of starting points. We choose to co-deliver two topics at once to prevent students getting "bogged down" in some of the mathematical or abstract concepts, instead having variety during any week's lessons. This also helps to bridge gaps between students whose prior learning in some topics has been more detailed than others. The large amount and high quality of the exam preparation and assessment resources offered by AQA and designed by ourselves to match their question style is also an important factor in this choice.

PREPARING FOR STUDY

Top tips – what would be useful to revise from GCSE:

Waves, forces, electricity, electromagnetic spectrum…. But to be honest, the best thing about A-level Physics is that it's not GCSE any more! Read a book or watch a film (below) instead.

EMPLOYABILITY

https://www.prospects.ac.uk/careers-advice/what-can-i-do-with-my-degree

The Institute of physics has published loads of interesting stuff on Physics careers… start at http://www.iop.org/careers/undergrad--postgrad/your-future/page_64487.html#gref

FILMS

- Gravity (Alfonso Cuaron, 2013)
- Watch it first , then watch how they made it on YouTube – absolutely amazing
- Hawking (TVfilm, 2004)
- Apollo 13 (Ron Howard,

UNIVERSITY COURSES

Dozens of courses at all major universities including Oxford and Cambridge.

But no need to travel far to find out… both Nottingham Trent University and the University of Nottingham have excellent Physics degree courses… look on their websites then as soon as things are back to normal go to their Open Days which happen often.

But it's not just physics courses… A-level Physics underpins so many different courses or careers. Search up information on any of these if they appeal, and you'll find how useful A-level physics can be:

- Architecture
- Medical technology
- Engineering (any sort)
- Materials Science and/or Nanotechnology
- -Meteorology (weather science)
- -Astrophysics

(NOTE: For these and many other courses it is usually required that you also have Maths A-level this is why we recommend to all our Physics students that they consider doing Maths A-level as well.)

PEOPLE TO RESEARCH

- Albert Einstein – in particular, find out what $E=mc^2$ is all about
- Isaac Newton – what did he work out when an apple fell?
- Galileo – what are the Galilean moons and why were they so important?

USEFUL ONLINE LINKS

YouTube has so many items of interest… everything by the SloMo guys is recommended, e.g https://www.youtube.com/watch?v=GIMVge5TYz4

Lots of physics effects can be played with using the excellent simulations from pHeT… try for example playing with planets and moons at https://phet.colorado.edu/sims/html/gravity-and-orbits/latest/gravity-and-orbits_en.html

Some universities also put out regular web materials.. try for example University of Nottingham's Sixty Symbols series: http://www.sixtysymbols.com/

OUR TOP READS

- A Short History of Nearly Everything – Bill Bryson (easily readable, covers many natural science ideas)
- Big Bang – Simon Singh (mainly about astrophysics)
- Stuff Matters – Mark Miodownik (mainly about physics of materials)
- The Elegant Universe – Brian Greene (quantum effects, relativity plus some more advanced ideas on string theory)
- A brief History of Time – Stephen Hawking (space and time and everything!)

LINKS TO THE SPECIFICATIONS

Full syllabus at https://www.aqa.org.uk/subjects/science/as-and-a-level/physics-7407-7408

(pages 11-43 give details of what we will cover, but can be a bit daunting, feel free to leave this for now)