

Preparation for A level Physics – Summer Work

Try at least one of these optional learning activities (OLA) over the summer and complete the **Head Start to AS Physics book**. We will be collecting in your **marked solutions, a list of your strengths and weaknesses and a 1 page write up** (400 – 600 words) on your completion of a physics OLA of your choice.

Read a physics book

This site: http://www.thestudentroom.co.uk/wiki/Recommended_Physics_Reading has some great suggestions. If you are interested in particle physics, I would also recommend “The God Particle: If the Universe is the Answer, What is the Question?” (Leon Lederman) which centres around the search for the Higgs Boson. Or “Beyond the God Particle” which is a follow up book written after the Higgs boson was actually discovered. Particle physics is studied in year 13.

These books will go beyond what we will study in A level, but will help give you a flavor for what physics is all about – and hopefully drive you to learn more about how the universe works!

Subscribe to (and read) a science or physics magazine

We recommend:

- Physics World
- New Scientist
- Quanta
- Scientific American
- Discover

Download and listen to a physics or science podcast series:

We recommend

- Inside Science
- The Life Scientific
- Infinite Monkey Cage
- Hubbletalk
- Ask a Space Man
- Physics World
- Titanium Physicist
- Star Talk
- Oxford Department of Physics (vodcast)

Visit a science or physics themed exhibition

- Visit the Royal Society Science Exhibition happening July 4-9! <https://royalsociety.org/events/summer-science-exhibition/> - in particular, there is a talk happening on July 3rd at 6pm on materials science (<https://royalsociety.org/science-events-and-lectures/2017/07/twilight-material-world/>). There are also loads of interesting exhibits to see on cutting edge science and research all being done here in the UK.
- The Royal Institution Lectures – keep on eye on this site: <http://rigb.org/whats-on> for interesting science themed lectures and events.

Take a science or physics course – this is a more challenging goal, but may be a great option for the passionate physicists and mathematicians among you!

- The Royal Society
 - Engineering in 3D: A one day workshop on 3D imaging technology, including hands on experiments to collect and reconstruct 3D images. <http://www.rigb.org/whats-on/events-2017/july/summer-schools-2017-engineering-in-3d-1618>
 - Computer based mathematics: A 5 day course in how to use Mathematica (a mathematical software) where you will use computing to explore mathematics. You will have the chance to work on and present a project of your choice: <http://www.rigb.org/whats-on/events-2017/july/summer-schools-computer-based-mathage-16-18>
 - Engineering on track: This is a one day course on civil engineering as it applies to designing trains - <http://www.rigb.org/whats-on/events-2017/august/summer-schools-2017-engineering-on-track-1618>
 - Mathematics for scientists: This course is one day and is designed to give you a grounding in the maths you will need to prepare you for A level sciences - <http://www.rigb.org/whats-on/events-2017/august/summer-schools-mathematics-for-scientists-age-16>
 - Mathematics for astronomers: This is a one day course dealing with some of the mathematics used in astronomy. It will relate particularly to the astronomy you will cover during the A level physics in year 13. <http://www.rigb.org/whats-on/events-2017/august/summer-schools-mathematics-for-astronomersage-16>
- MOOCs (Massive Open Online Courses): Try completing a free online course this summer on something you are interested in
 - Evolution of the universe from the Big Bang to Dark Energy: <http://www.mooc-list.com/course/big-bang-dark-energy-coursera>
 - A Brief Guide to everything: A course on particle physics. This course helps you understand what we do know, and the questions that are still to be answered about our universe. <https://www.mooc-list.com/course/brief-guide-everything-iai-academy?static=true>
 - Descriptive intro to physics – this course focusses on understanding the basics of physics but does not delve into mathematical detail: <https://www.mooc-list.com/course/descriptive-introduction-physics-wma?static=true>
 - Learn about some of the questions that have been answered in physics over the past 2000 years: <https://www.mooc-list.com/course/introduction-physics-udacity?static=true>
- There are many more free online courses offered – find one that sounds good to you!

And as a bonus – for something relaxing to do, learn a bit more about a famous mathematician or physicist by watching *The Imitation Game* (Alan Turing), *A Beautiful Mind* (John Nash) or *The Theory of Everything* (Stephen Hawking). Or watch a fun movie with some decent physics (although be warned, nearly all films have **some** bad science or physics – see if you can spot the mistakes!) – *The Martian*, *Gravity*, *October Sky*, *2001: A Space Odyssey* and *Apollo 13* are all good choices.

Have a fun and interesting summer!