

Physics A Level

Preparation work: Pre-course Reading, Research and Tasks

Pre-reading and research will help you to become more familiar with the topics you are going to study on your A Level Physics course. If you complete the tasks below, they will also help you to become more confident when you start your course. Remember it is also a good idea to make sure you recap and consolidate your GCSE Physics knowledge as well.

Specification:

We study the **AQA specification**, as it has an excellent balance, including good option topics and the opportunity for lots of practical work.

Task 1:

Explore and experiment:

The PhET website has dozens of simulations and online experiments for you to try. Each one comes with a list of suggested tasks (look in the “for teachers” section). Most will work on any device, some require Java. Start with one that you are confident of your knowledge of (e.g. **Hookes Law**). Work your way through the different parts of the simulation. Now find a simulation that supports part of the A-Level spec that you perhaps haven’t seen before (e.g. **Wave Interference**). Investigate the simulation and use it as a starting point to research an area or physics that interests you.

Write a short report (1 side of A4) summarising your findings of the simulation you chose. Feel free to use screenshots to illustrate.

Task 2:

Consolidate your GCSE understanding

Improve your maths: Having strong Algebra, Trigonometry and Graphing skills are essential at A-Level. Khan Academy is an excellent “MOOC” for developing these skills.

Create an account and work through **Algebra Basics**.

You should keep a record by saving your scores on each of the unit tests and the course challenge.

If you want to go further, the **trigonometry** course will also be very useful.

The Khan Physics Course is also interesting, but you may find it more useful to revise the GCSE course using your existing resources.

Websites for Further Research and Reading:

Institute of Physics: particularly [iopSPARK](#)

CERN the whole site is great but [this collection](#) is set at the right level

Walter Lewins YouTube Channel is full of gems but start with: [“For the love of Physics”](#)

HyperPhysics looks a little dated but pulls all of physics into a huge mind map

The Royal Institute is the home of science

<https://www.iter.org> Learn about the latest development in fusion reactors

<https://www.zooniverse.org> Gives you the opportunity to contribute to real scientific research.

Everything from finding [exoplanets](#) to analysing [LIGO](#) data.

Books to Read:

- CGP do a great transition textbook: **Head Start to A-level Physics**
- Almost any book by Richard Feynman, but an excellent start is **Six Easy Pieces**.
- **How to teach quantum physics to your dog** by Chad Orzel is an excellent overview.
- **A Short History of Nearly Everything** by Bill Bryson is a fun way to get a full picture of science

Podcasts:

There are many, many to choose from, but here are a few I enjoy:

The Life Scientific: Jim Al-Khalili talks to leading scientists about their life and work

Infinite Monkey Cage: witty, irreverent look at the world. With Brian Cox and Robin Ince

The Curious Cases of Rutherford & Fry: investigate everyday mysteries sent by listeners

Stephen Fry’s Great Leaps: wonderful run through the history of inventions

Institute of Engineering & Technology: highlights the best Engineering podcasts

Tales from the prep room: a great playlist featuring practical physics from the Royal Institute

Films to Watch:

Follow the links to find out about these films:

- [Hidden Figures](#)
- [The Martian](#)
- [Particle Fever](#)
- [The Theory of Everything](#)
- [Apollo13](#)

Progression Opportunities

Why choose Physics A Level:

There are numerous Higher Education and Apprenticeship Pathways that are enhanced by the skills developed in A-Level physics.

- Physics (Nuclear/ Particle / Quantum/ Astro /)
 - Practical Research
 - Theoretical
- Engineering
 - Civil
 - Mechanical
 - Aeronautical/Aerospace
 - Electronic
 - ... many more



- Architecture
- Pilot
- Medicine / Medical Physics / Radiology
- Computer Science
- Material Science
- Finance and Economics

You can find an overview of engineering disciplines and careers here: [This is Engineering](#)

The Institute of Physics has career advice here: [Institute of Physics Careers](#)

Another site about careers related to Physics is this one: [Prospects website careers advice](#)

Institute of Mechanical Engineers [Careers site](#)

Institute of Engineering and Technology [Careers site](#)

Institute of Civil Engineering [Information Page](#)

Royal Aeronautical Society [Careers Page](#)

Royal Institute of British Architects [Careers Page](#)

We hope you enjoy completing these tasks and look forward to you joining the course.

