



Introduction

Physics A Level from AQA provides a seamless transition to A Level from previous studies at IGCSE and develops students interest and enthusiasm for physics. The Year 13 course provides different starting points so teachers can choose to start the course with familiar or new topics. This allows the Physics department to develop a course that is not only challenging but academically stimulating for the students.

Four weekly classes of 80 minutes duration are dedicated to the study of physics over the two-year cycle. Normally, one of the four will be devoted to acquiring experimental skills through practical work in the laboratory. A full range of experiments centred mainly on mechanics, heat, light, oscillations, electricity and magnetism is undertaken.

Content

The full A Level course consists of a core content and an option module that allows students to pursue and area of physics that may be of more interest to them or relevant to an area of study at university. Specification can be found at:

<http://filestore.aqa.org.uk/resources/physics/specifications/AQA-7407-7408-SP-2015.PDF>

Core Topics:

- Measurements and their errors
- Particles and radiation
- Waves
- Mechanics and materials
- Electricity
- Further mechanics and thermal physics
- Fields and their consequences
- Nuclear physics

Options

- Astrophysics
- Medical physics
- Engineering physics
- Turning points in physics
- Electronics

Skills

The new A Level Physics course is designed to fully test students abilities to design, carry out, and communicate experimental procedures to a very high standard. The practical endorsement, now required when applying through UCAS to UK Universities, improves students investigative skills to a standard used by university departments around the world. The main skill foci are listed below

1. To support and consolidate scientific concepts (knowledge and understanding). This is done by applying and developing what is known and understood of abstract ideas and models. Through practical work we are able to make sense of new information and observations, and provide insights into the development of scientific thinking.

2. To develop investigative skills. These transferable skills include:

- Devising and investigating testable questions
- Identifying and controlling variables
- Analysing, interpreting and evaluating data.
- To build and master practical skills such as:
- Using specialist equipment to take measurements
- Handling and manipulating equipment with confidence and fluency
- Recognising hazards and planning how to minimise risk.

Homework

Will comprise of exam style questions once per week, which focuses on the core content in the syllabus and at least one online homework set through ISAAC PHYSICS, which provides opportunities for extension. In addition to these common homework tasks pupils will have the opportunity to study for the Oxford challenges, however, this does require additional study at home.

Assessment

Students will be assessed at the end of every topic, and before each reporting cycle. Students will also receive an end of year full Internal exam which counts towards their predicted grades for university.

In year 12 the students will be assessed on the following topics:

- Measurements and their errors
- Particles and radiation
- Waves
- Mechanics and materials
- Electricity

In year 13 the students will be assessed on the following topics:

- Further mechanics and thermal physics
- Fields and their consequences
- Nuclear physics

And one of the following options:

- Astrophysics
- Medical physics
- Engineering physics
- Turning points in physics
- Electronics

The final assessment is comprised of three external exam papers.

- Paper 1 covers all material from year 12

- Paper 2 covers all material from Year 13
- Paper 3 covers questions based on classroom core practical's and the additional option topic.

Digital usage in this subject

Graph plotting including tables, data analysis for practical work. In some cases note taking using the iPad or computer. Keynote/Powerpoint presentations. Online simulations for demos or even experiments, online homework

Average time spent each homework

Depends on topic might vary from no digital HW per week to maybe 1-2 hours. Core practicals require the use of spreadsheet and word processors and might take longer. Students are at times asked to produce presentations using Keynote/Powerpoint. YouTube videos might also be shared and set as homework on channels such as AlevelPhysics, Veritassium... If students use their computer/iPad for notes and homework they might spend up to 3 hours per week.

Typical tasks set

Online assignment on a specific topic using the website Isaac Physics. Also, although they are normally given a printed copy, students have to do IOP (Institute of Physics questions) whose answers can be found online. Finally, resources, class presentations, links to videos or relevant material and homework is posted on Google Classroom.

Resources and Materials

Theory classes are supported by excellent textbooks – endorsed by AQA – that are seldom used in class but form the basis for home study and revision exercises:

“Advanced Physics For You” by Keith Johnson Published by Oxford university press
www.isaacphysics.com

The pupils are also provided with a further range of texts that go further and deeper than syllabus requirements.

Practical work is carried out in a purpose-built physics laboratory with a full range of apparatus including multimeters, signal generators and cathode ray oscilloscopes. The laboratory is equipped with an interactive white board that greatly facilitates the viewing of experimental simulations. The pupils are encouraged to do their own independent research and build a bank of internet addresses for future reference.

Apps and websites habitually used

Isaac Physics (online homework), physicsandmathstutor (past paper questions and revision), savemyexams (past paper questions and revision), umutech (past paper questions and revision), PHET simulations (online simulations), IOP (practice questions, not past papers), different YouTube channels (ALevelPhysics, ScienceShorts for example...)