



PHYSICS

**Gordon's
Sixth Form**

A LEVEL

Year 12

During Year 12, students will study:

Particles and radiation: This section introduces students both to the fundamental properties of matter, and to electromagnetic radiation and quantum phenomena.

Waves: GCSE studies of wave phenomena are extended through a development of knowledge of the characteristics, properties, and applications of travelling waves and stationary waves. Topics treated include refraction, diffraction, superposition and interference.

Mechanics and materials: Vectors and their treatment are introduced followed by development of the student's knowledge and understanding of forces, energy and momentum. The section continues with a study of materials considered in terms of their bulk properties and tensile strength.

Electricity: This section builds on and develops earlier study of these phenomena from GCSE. It provides opportunities for the development of practical skills at an early stage in the course and lays the groundwork for later study of the many electrical applications that are important to society.

Year 13

To complete the A-Level content, students will study the following topics in addition:

Further mechanics and thermal physics: The earlier study of mechanics is further advanced through a consideration of circular motion and simple harmonic motion (the harmonic oscillator). A further section allows the thermal properties of materials, the properties and nature of ideal gases, and the molecular kinetic theory to be studied in depth.

Fields and their consequences: Practical applications considered include: planetary and satellite orbits, capacitance and capacitors, their charge and discharge through resistors, and electromagnetic induction.

Nuclear physics: This section builds on the work of particles and radiation to link the properties



of the nucleus to the production of nuclear power through the characteristics of the nucleus, the properties of unstable nuclei, and the link between energy and mass.

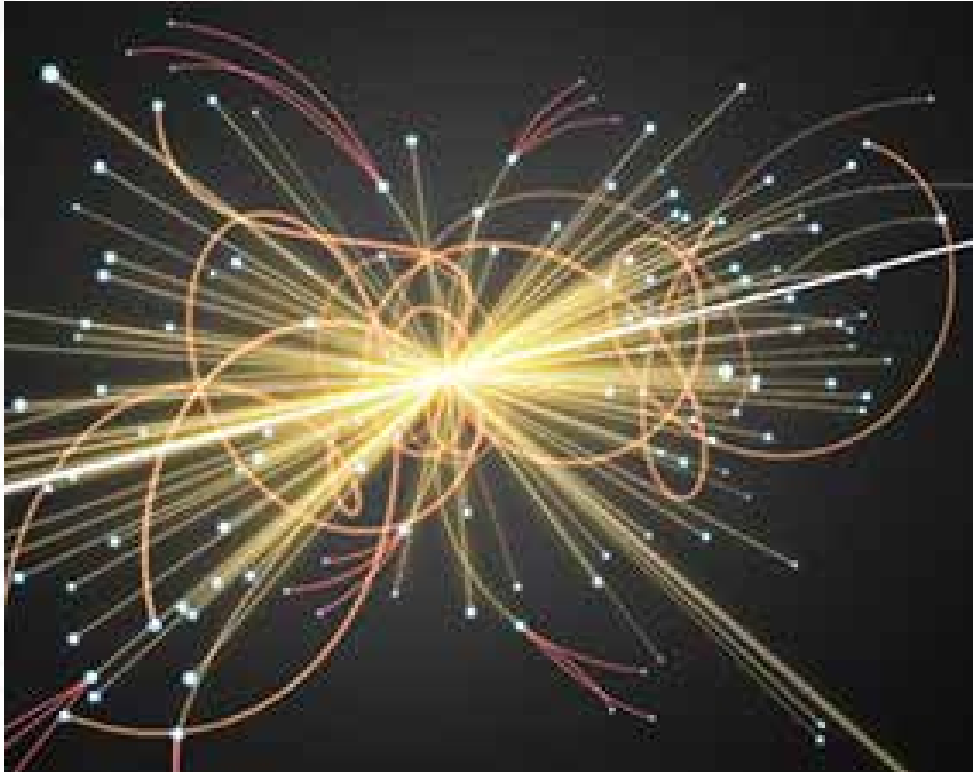
An optional topic which could be:

Turning points in physics; this topic looks at the important areas of the history of physics and the development of modern theories.

Engineering physics which takes mechanics further, learning how the combustion engine works as well as refrigerators and heat pumps.

Medical physics which allows students to study the eyes, ears as well as different forms of medical imaging.

Astronomy which allows students to explore the solar system and universe.



Transferable skills

- Problem solving
- Communication
- Research skills
- Numeracy
- Analytical skills

What can I study at university?

- Physics
- Astrophysics
- Mechanical Engineering
- Aeronautical Engineering
- Medicine
- Materials Science
- Dentistry
- Computer Science
- Architecture
- Sports Science

Careers

Physics is a good foundation for:

- Theoretical Physicist
- Financial Services
- Armed Forces
- Games Developers
- Engineering
- Architecture

Famous people who studied physics

- Dara O Briain
- Brian May
- Brian Cox

PHYSICS

HEAD OF DEPARTMENT

Mr A Wallace

awallace@gordons.school

Exam Board

AQA

Specification

7408

COURSE DETAILS

Examination

The course is examined as a whole at end of Year 13.

Topic 1: Measurements and errors

Topic 2: Particles and radiation

Topic 3: Waves and optics

Topic 4: Mechanics and materials

Topic 5: Electricity

Topic 6: Further Mechanics

Topics 1 – 6 taught in Year 12. Also in Year 12 students complete 6 required practicals. These will be assessed in public examinations in Year 13.

Topic 1: Measurements and errors

Topic 7: Fields

Topic 8: Nuclear Physics

Topic 9: Option Topic

Topics 1, 7 – 9 taught in Year 13. Also in Year 13 students complete 6 more required practicals. These will be assessed in public examinations.

HOW WILL I BE ASSESSED?

Exam Papers Year 13	% of GCE	Details
Paper 1: Topics 1 – 6 & periodic motion (6.1) (2 hours)	34%	85 marks: 60 marks of short and long answer questions, 25 marks of multiple choice.
Paper 2: topics 6.2-8 (2 hours)	34%	85 marks: 60 marks of short and long answer questions, 25 marks of multiple choice, assumed knowledge from previous topics.
Paper 3: Practical skills & option topic.	32%	80 marks: 45 marks of short and long answer questions on practical skills and data analysis; 35 marks of short and long answer questions from the option topic.

WIDER READING

- Stephen Hawking: A Brief History of Time; The Grand Design
- Brian Greene: An Elegant Universe; The Fabric of the Cosmos; The Hidden Reality
- Brian Cox: Wonders of the Solar System; Wonders of the Universe; Why does $E=mc^2$?; The Quantum universe
- Richard Feynman: QED – The Strange Theory of Light and Matter; Surely You're Joking Mr Feynman
- Robert Gilmore: Alice in Quantumland: An Allegory of Quantum Physic



Gordon's School
West End, Woking
Surrey, GU24 9PT

www.gordons.school
01276 858084