

# PHYSICS

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**Exam board:** AQA

**Assessment methods:** 100% Written Assessment. No coursework or practical assessed component.

**Length of exams:** 3 x 2 hour papers

Paper 1: Units 1 to 6.1

Paper 2: Units 6.2 to 8

Paper 3: Practical Skills and data Analysis plus Option Topic

## **Breakdown of units:**

1. Measurements and their Errors: Content in this section is a continuing study for a student of physics. A working knowledge of the specified fundamental (base) units of measurement is vital. Likewise, practical work in the subject needs to be underpinned by an awareness of the nature of measurement errors and of their numerical treatment.

2. Particles and Radiation: This section introduces students both to the fundamental properties of matter, and to electromagnetic radiation and quantum phenomena. Through a study of these topics, students become aware of the way ideas develop and evolve in physics. They will appreciate the importance of international collaboration in the development of new experiments and theories in this area of fundamental research.

3. 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.

4. 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.

5. 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.

6. 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.

7. Fields and their Consequences: The concept of field is one of the great unifying ideas in physics. The ideas of gravitation, electrostatics and magnetic field theory are developed within the topic to emphasise this unification. Many ideas from mechanics and electricity from earlier in the course support this and are further developed. Practical applications considered include: planetary and satellite orbits, capacitance and capacitors, their charge and discharge through resistors, and electromagnetic induction. These topics have considerable impact on modern society.

8. 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. Students should become aware of the physics that underpins nuclear energy production and also of the impact that it can have on society.

Option Topic: Turning Points in Physics: This option is intended to enable key concepts and developments in physics to be studied in greater depth than in the core content. Students will be able to appreciate, from historical and conceptual viewpoints, the significance of major paradigm shifts for the subject in the perspectives of experimentation and understanding.

## **Overlap with other subjects:**

The AQA GCE Physics Specification overlaps with many of the Science specifications. The overlap with GCE Mathematics rests only on the use and application of formulae and equations.

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