

PHYSICS KS5 CURRICULUM

ROADMAP

Maths and Practical Skills

Students develop key mathematical techniques essential for analysing and solving physical problems, including algebra, trigonometry, and data handling. Emphasis is also placed on planning, conducting, and evaluating experiments using correct methods and scientific thinking.

Energy and materials

Focuses on how energy is stored, transferred, and conserved in different systems. Students also study the mechanical properties of materials, such as stress, strain, and elasticity, to understand how materials respond to forces.

Particles and Quantum

Covers the fundamental building blocks of matter, including atoms, subatomic particles, and the Standard Model. Students also explore quantum phenomena like the photoelectric effect and wave-particle duality.

Waves and Optics

Students investigate the properties of waves, including reflection, refraction, diffraction, and interference. The topic also covers how light behaves as both a wave and a particle, with practical work in lenses and optical instruments.

Further Mechanics

Builds on earlier motion topics to include circular motion. Students also explore energy transfers and the physics of simple harmonic motion in greater depth including resonance.

Astrophysics

Focuses on the physics of stars, galaxies, and the universe. Topics include stellar classification, life cycles of stars, cosmological principles, and methods used to observe and measure astronomical phenomena.

Electromagnetism

Explores how electric currents create magnetic fields and how changing magnetic fields induce currents. This includes practical applications such as electric motors, generators, and transformers.

Electricity

This topic explores electric current, potential difference, resistance, and electrical power. Students learn how circuits work, both in theory and through practical application, including the behaviour of components such as resistors, diodes, and thermistors. The concept of internal resistance is introduced.

Statics and Linear Motion

Introduces the concepts of force, velocity, acceleration, and equilibrium. Students learn how to describe and predict the motion of objects in straight lines and understand how balanced forces affect static systems.

Newton's Laws and Momentum

Explains how forces cause motion and how objects interact. Students learn Newton's three laws of motion, the principles of momentum, and how they apply to collisions and explosions in everyday and experimental contexts.

Thermal Physics

Focuses on the behaviour of gases, temperature, internal energy, and heat transfer. Students study how energy affects matter at the molecular level, including the laws of thermodynamics and ideal gas behaviour.

Gravitational and Electric Fields

Students examine the forces that act at a distance. This includes how gravitational and electric fields are formed and how they influence the motion of masses and charges, as well as the concept of field strength and potential.

Nuclear Physics

Covers the structure of the atomic nucleus, radioactive decay, and nuclear reactions. Students will deal with exponential decay functions, and problem solve using this mathematical approach.

Capacitors

Introduces how capacitors store and release electrical energy. Students learn about charging and discharging behaviour, energy storage, and their uses in electrical circuits.

AQA A-level Physics is a rigorous and rewarding course that helps students develop a deep understanding of the laws that govern the universe—from the tiniest particles to the largest galaxies. Alongside theoretical knowledge, students build strong practical and analytical skills that are highly valued in further study and a wide range of careers. Whether pursuing science, engineering,