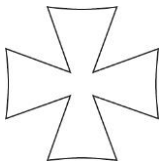


Physics GCSE

Physics is the science of the fundamental concepts of field, force, radiation and particle structures, which are inter-linked to form unified models of the behaviour of the material universe. From such models, a wide range of ideas, from the broadest issue of the development of the universe over time to the numerous and detailed ways in which new technologies may be invented, have emerged. These have enriched both our basic understanding of, and our many adaptations to, our material environment.

By studying GCSE Physics, students will learn to understand how, through the ideas of physics, the complex and diverse phenomena of the natural world can be described in terms of a small number of key ideas which are of universal application and which can be illustrated in the separate topics set out below.

These ideas include:

- the use of models, as in the particle model of matter or the wave models of light and of sound
- the concept of cause and effect in explaining such links as those between force and acceleration, or between changes in atomic nuclei and radioactive emissions
- the phenomena of ‘action at a distance’ and the related concept of the field as the key to analysing electrical, magnetic and gravitational effects
- that differences, for example between pressures or temperatures or electrical potentials, are the drivers of change
- that proportionality, for example between weight and mass of an object or between force and extension in a spring, is an important aspect of many models in science
- that physical laws and models are expressed in mathematical form.

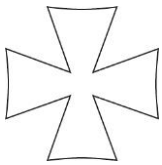
The new specifications for GCSE Physics includes the following topics:

Energy

- Energy changes in a system, and in the ways energy is stored before and after such changes
- Conservation, dissipation and national and global energy sources

Forces

- Forces and their interactions
- Work done as force x distance, energy transfer
- Pressure and pressure differences in fluids
- Moments, levers and gears



Forces and motion

- Speed and velocity, speed as distance over time; acceleration; distance-time and velocity-time graphs
- Forces, accelerations and Newton's laws of motion
- Safety in public transport

Waves in matter

- Waves in air, fluids and solids
- Waves at material interfaces: applications in exploring structures

Light and electromagnetic waves

- Frequency range of the spectrum
- Interactions of electromagnetic radiation with matter and their applications
- Lenses
- Colour and frequency; differential effects in transmission, absorption and diffuse reflection
- Black body radiation

Electricity

- Current, potential difference and resistance
- Series and parallel circuits
- Domestic uses and safety
- Energy transfers
- Static electricity – forces and electric fields

Magnetism and electromagnetism

- Permanent and induced magnetism, magnetic forces and fields
- Magnetic effects of currents and the motor effect
- Magnetic effects of currents and the motor effect
- Induced potential, transformers and the national grid Microphones and speakers; oscillating currents in detection and generation of radiation

Particle model of matter

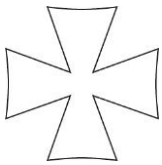
- Changes of state and the particle model
- Internal energy, energy transfers and particle motions
- Particle model and pressure

Atomic structure

- Nuclear atom and isotopes
- Absorption and emission of ionizing radiations and of electrons and nuclear particles
- Hazards and uses of radioactive emissions and of background radiation
- Nuclear fission and fusion

Space physics

- Solar system; stability of orbital motions; satellites
- Red-shift as sources move away; the 'big bang' and universal expansion



The format for the terminal exam is:

Paper 1:	Paper 2:
What's assessed: • Topics 1-4: Energy; Electricity; Particle model of matter; and Atomic structure	What's assessed: • Topics 5-8: Forces; Waves; Magnetism and electromagnetism; and Space physics. • Questions in paper 2 may draw on an understanding of energy changes and transfers due to heating, mechanical and electrical work and the concept of energy conservation from Energy and Electricity. .
How it's assessed: • Written exam: 1 hour 45 minutes • Foundation and Higher Tier • 100 marks • 50% of GCSE	How it's assessed: • Written exam: 1 hour 45 minutes • Foundation and Higher Tier • 100 marks • 50% of GCSE
Questions: Multiple choice, structured, closed short answer and open response	Questions: Multiple choice, structured, closed short answer and open response