

The Physics Curriculum – Year by Year

Prior Learning from KS3

From Year 7 and Year 8 boys have a secure grounding in fundamental physics through studying a course aligned to the full KS3 National Curriculum. In addition, they develop a sound understanding of how to think like a scientist, applying the scientific method and how to plan and carry out investigations. We use this prior knowledge and build upon these principles through our GCSE provision.

Year 9

The content in Y9 is deliberately chosen to be relevant to both the AQA Triple (8463) and AQA Combined Science Trilogy (8464) courses. The following topics are studied during the year:

- Basic magnetism
- Energy stores and pathways, energy conservation, efficiency
- Calculations involving energy stores, power and work done
- Renewable and non-renewable means of generating electricity
- The National Grid and domestic electricity
- The particle model of matter and introduction to thermal physics (specific heat capacity) and gas laws
- Fundamental mechanics including speed, velocity, acceleration, graphical analysis, forces and Newton's Laws, forces and elasticity and Hooke's Law

These topics provide students with an introduction to many of the key themes in Physics which are applicable whether they are then selected to continue with Separate Sciences or move on to the Trilogy Combined Science course in Year 10.

Year 10

Separate Sciences Route

Sets T1-T5 study the AQA Physics (8463) course and follow the Separate Sciences route. The following topics are studied during the year:

- Further mechanics including forces as vectors, momentum, moments, gears
- Pressure in solids, liquids and gases, upthrust and further thermal physics
- Static electricity and electric fields
- Current electricity and circuits
- Electromagnetism including the motor effect

These topics build on the content studied in year 9 and include some of the more challenging Separate Science only material.

Combined Science Route

Sets C1-C3 study the AQA Trilogy (8464) course. The following topics are studied during the year:

- Further mechanics including gravity, weight and terminal velocity, work and energy, vectors and momentum
- Current electricity and circuits
- Electromagnetism

These topics build on the content studied in Year 9 with the slightly reduced volume of content on this course allowing more opportunities for consolidation of learning and practice of key principles.

Year 11

Separate Sciences Route

Sets T1-T5 study the AQA Physics (8463) course and follow the Separate Sciences route. The following topics are studied during the year:

- Electromagnetic induction and the generator effect including transformers
- Waves and wave analysis including mechanical and electromagnetic waves
- Atomic and nuclear physics including nuclear decay
- Space

These topics build on the content studied in Year 9 and Year 10, the Year 11 work contains many of the more conceptually demanding aspects of the course. A generous amount of time is provided for guided revision to allow thorough consolidation of the course material prior to GCSE examinations.

Combined Science Route

Sets C1-C3 study the AQA Trilogy (8464) course. The following topics are studied during the year:

- Atomic and nuclear physics including nuclear decay
- Waves and wave analysis including mechanical and electromagnetic waves

These topics build on the content studied in Year 9 and Year 10, the Year 11 work contains many of the more conceptually demanding aspects of the course. A generous amount of time is provided for guided revision to allow thorough consolidation of the course material prior to GCSE examinations.

Year 12

From the Eduqas specification:

From Component 1:

Basic physics
Kinematics
Dynamics
Energy concepts
Kinetic theory
Thermal physics

From Component 2:

Conduction of electricity
Resistance
D.C. circuits
Capacitance
Solids under stress
Using radiation to investigate stars

From Component 3:

Particles and nuclear structure

Year 13

From Component 1:

Circular motion
Vibrations

From Component 2:

Electrostatic and gravitational fields of force
Using radiation to investigate stars
Orbits and the wider universe

From Component 3:

The nature of waves
Wave properties
Refraction of light
Photons
Lasers
Nuclear decay
Nuclear energy
Magnetic fields
Electromagnetic induction

The option topic of Energy and the Environment is covered at stages during the course when relevant concepts are studied from other units and then the whole topic is revised in Year 13.