



The curriculum for this stage of students' education has been designed to build upon their prior knowledge from year 9 and 10 GCSE Physics. This course provides a worthwhile background for all students, whether or not they intend to go on to study Physics beyond GCSE. The course enables students to acquire a body of scientific knowledge and develop an understanding of the ideas and applications of Physics e.g. Energy, Forces and Motion, Waves and the Electromagnetic Spectrum. This is set in the context of knowing and understanding a body of scientific facts. Students acquire an understanding and experience of the methods used in science and of the application of experimental techniques in everyday life.

### HALF TERM 1: Forces and Motion, Waves, Electromagnetic Spectrum and Light

#### STUDENTS MUST KNOW:

- Force and Acceleration. To understand how much force is needed to change an objects motion.
- Acceleration Investigation. To investigate the acceleration of a system with a constant mass and varying mass.
- Braking Forces and Momentum. To understand the factors influencing the stopping distance of a car.
- Weight and Terminal Velocity. To describe the motion of a falling object in a fluid under the effect of gravity.
- The Nature and Properties of Waves. To be able to identify transverse and longitudinal wave and describe how they transfer energy using a particle motion model identifying wavelength and frequency to calculate the speed of a wave.
- Reflection and Refraction. To be able to describe the effects of reflection and refraction.
- Reflection Investigation. To investigate the law of reflection and how it applies to visual effects.
- Sound and Seismic Waves (T).
- Reflection and Refraction of Light (T).

**REQUIRED PRACTICAL 6** – Make observations to identify the suitability of apparatus to measure the frequency, wavelength and speed of waves in a ripple tank and waves in a solid and take appropriate measurements.

- The Electromagnetic Spectrum. To understand the spectrum of electromagnetic waves and how they transfer energy.
- Light, IR, Microwave and Radio Waves. To understand the uses of light, infrared, microwave and radio waves in the world around us.
- Infrared Light Investigation. To investigate the emission and absorption of infrared radiation.

### HALF TERM 2: Waves Continued, Magnetism and Electromagnetism

#### STUDENTS MUST KNOW:

- Communications. To understand how a communication network uses radio, microwave and fibre optics to transfer information.
- Ultraviolet waves, X-Rays and Gamma Rays. To understand the properties and uses of ultraviolet waves, X-Rays and Gamma Rays.
- X-Rays in Medicine. To understand how are X-Rays used in medicine.
- Light and Colour. To understand how white light interacts with objects (T).
- Lenses. To understand how a convex and concave lens focuses and magnifies light (T).
- Magnetic fields: Understand the shape of magnetic fields
- Electromagnetism and its uses: Understand how electromagnets are constructed and used
- The motor effect and using it: Explain how motors work
- Loudspeakers and how they work
- Induced potential and factors that effect the size
- The generator effect and a.c. generation
- How microphones work
- Understand how transformers work and use the transformers equation

#### HOW THIS WILL BE ASSESSED:

Students will be assessed by a progress test half way through the topic as well as an end of topic assessment.

### HALF TERM 3: Lenses, Space

#### STUDENTS MUST KNOW:

- Lenses and images: Understand how concave and convex lenses refract light
- Constructing ray diagrams: Construct diagrams for refraction in concave and convex lenses
- Magnification and calculations: Understand how to use the magnification formula and rearrange it
- Magnetic fields: Understand the shape of magnetic fields
- The Life cycle of stars: To understand the birth and death of stars
- The solar system and its orbits: Explain how the planets orbit the Sun
- Red-shift and the big bang: Evaluate the evidence for the big bang theory

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**HALF TERM 4:**

Consolidation, Revision and Past Papers

**HALF TERM 5:**

Consolidation, Revision and Past Papers

Embedding this knowledge can be supported at home by reviewing class notes, guided learning wider reading, exam practice questions, independent research and study, completing set independent study tasks, watching in scientific documentaries and understanding current issues in the scientific world. In addition, use the AQA website, BBC Bitesize and GCSEPOD in conjunction with suitable revision guides.