Subject Area: Physics

Curriculum Intent: To instil enthusiasm for science and to develop an interest in further study and careers associated with the subject, in the fields of medicine, engineering, environmental or other science related subjects. Through our courses we aim to equip our students with a detailed body of knowledge as well as help them build the skills required to make progress and achieve success in the scientific enterprise. A key aim is to make our students more powerful abstract, logical thinkers. Within the study of each our science courses, we enable students to develop and demonstrate a deep subject knowledge, an understanding of scientific methods, as well as develop competence and confidence in a variety of practical, mathematical, research, analytical and problem-solving skills. We also aim to extend the cultural capital of our students by increasing their scientific literacy and engagement in discussion and critical evaluation of science in the media. We aim to equip them with an understanding of the interplay between science, technology and society, the role that scientists have had in creating problems and mitigating impacts, as well as how the sciences contribute to the success of the economy and society. Complementary to this, sits our commitment to embed both the academy's professional standards and sense of civic virtue: our aim is for students to understand varying viewpoints of the scientific enterprise as well as consider the consequences and integrity of decisions and actions that they take as scientists, as individuals, and as a community, on the environment, on themselves and on others.

Dates	Content	Assessment	Rationale
Term 1	Module 2 – Fundamentals of Physics 3.1.1 Kinematics and motion graphs, stopping 3.1.2 Linear motion and projectile motion 3.2 Weight, drag, centre of mass 3.2 Moments and equilibrium 3.2 Density and Pressure	PAG 1 - Determining g PC1a & revision. Retrieval roulette. Practice exam questions.	Builds on the ideas that were introduced at GCSE and permeate throughout Physics. Understanding of quantities, units, scalars and vectors helps Physicists to effectively communicate their ideas within the scientific community. PS/CV's: Equips students with language needed to express scientific ideas and critically analyse scientific work.
Term 2	3.3 Work, energy and power 3.4 Materials: springs and Hooke's law 3.5 Newton's laws, momentum and collisions Module 3 Revision and Consolidation	PAG 2 – Young's Modulus PC1 & revision Retrieval roulette. Practice exam questions.	These topics provide students with an opportunity to engage in a range of practical activities. To access these topics, students require an understanding of the nature of forces and the equations needed to model objects that are in motion – all of which are covered previously in this unit. The idea of CoM shares many conceptual links with CoE. PS/CV's: Although efficiency of fossil fuels is not studied in this module, clear links are signposted to students to encourage them to consider their carbon footprint.
Term 3	4.1 Charge, Current, Kirchhoff 1, drift velocity 4.2 Potential difference, resistance and temperature, IV characteristics 4.2 Resistance, resistivity, power and cost 4.3 Kirchhoff 2 and circuits calculations	PAG 3 – Resistivity Retrieval roulette. Practice exam questions.	Scientific vocabulary learned in this section of the module is required to be able to access the circuits section later on.
Term 4	4.3 Resistors in series and parallel, internal resistance and terminal p.d. 4.3 Potential divider circuits and electricity consolidation 4.4 Waves: reflection, refraction, dispersion and EM spectrum 4.4 Waves and polarisation and superposition/interference	PC2 & revision PAG 4 – Potential dividers Retrieval roulette. Practice exam questions.	This section provides knowledge of electrical circuits and how these can be used, manipulated and studied to our advantage. This includes everyday applications as well as experimental skills and managing risks. By studying these topics in the order suggested, students build up the required scientific vocabulary to be able to communicate their ideas clearly when discussing circuit analysis. CEIAG: Career pathways in electrical engineering
Term 5	Waves recap 4.4 Stationary waves & harmonics 4.5 Photons, photoelectric effect and wave-particle duality Module 4 revision & consolidation	PAG 6 – Finding Planck's constant Retrieval roulette. Practice exam questions.	This module teaches key ideas of quantum physics. To access this content, students should have a good understanding of classical physics and the skills to make and use mathematical models. OCR have addressed these needs in module 3, so TSFA teaches in the order suggested by the specification.
Term 6	Revision of all content to date 5.1 Thermal physics	PAG 12 – Research project PAG 8 – Ideal gasses PC 3 Trial Exams & revision	General introduction to ideas & concepts that will be needed to explain Thermodynamics in Y13 T1. Builds from KS3 understanding of Kinetic model and temperature scales and quickly progresses to A-Level standard ideas about these topics.

Dates	Content	Assessment	Rationale
Term 1	5.2 Circular motion 5.3 Simple harmonic motion 5.4 – Gravity & gravitational fields PC1 Revision	PAG 8 – Investigating Gasses PAG 10 - Investigating SHM PAG 11 - Determining SHC of a material (Investigation) PC1 Retrieval roulette. Practice exam questions.	This module helps students build an understanding of the significance of the work of Newton and the success he had in modelling the behaviour of a wide range of aspects of the universe before the notion of Quantum Physics was developed. By studying the work of early Physicists, students can develop a sense of the pace of scientific progress as a result of their work. PS/CV's: Appreciation of how an improved understanding of thermodynamics helped develop the industrial revolution.
Term 2	5.4 – Gravity & gravitational fields ctd 5.5 – Objects in the Universe 5.5 ctd - Cosmology PC2 Revision	PC2 PAG 5 - Diffraction Retrieval roulette. Practice exam questions.	Students will build an appreciation of the relevance of Newton's work on gravitation in a modern set of circumstances. By studying the nature of circular motion prior to this topic, students are equipped to make connections between these topics in order to understand orbital mechanics and the careful design of satellites for communication and imaging. PS/CV's: Understanding of our place in the universe and the events that led to the formation of the present-day universe. Students will also understand the virtue of scientific endeavour and how a global effort has allowed us to build the sophisticated models and theories that we now have.
Term 3	6.1 - Capacitors 6.2 – Electric fields 6.3 – Magnetic Fields PC3 Revision	PAG 9 – Determining capacitance PC3 Retrieval roulette. Practice exam questions.	The sequential study of these topics allows the development of the required mathematical techniques, first in Maths lessons, and then in Physics lessons. Understanding of logarithms and exponential increase/decrease is required to model the behaviour of capacitors and then radioactive decay in later topics. Field theory links Gravitational Fields, Electric Fields, Magnetic Fields and Capacitors. CEIAG: Links between fields that rely on mathmetical modelling, particularly using exponential relationships. E.g. Epidemiology/virology.
Term 4	6.3 – Magnetic fields ctd 6.4 – Particle physics, radioactivity, nuclear physics PC4 Revision	PAG 7 – Ionising radiation PC4 Retrieval roulette. Practice exam questions.	The circular motion of charged particles in a magnetic field is studied in this topic and requires understanding of the content and mathematical techniques taught in Module 5. The structure of the atom and the emission of ionising radiation from its nucleus are concepts that are closely related and hence taught in succession.
Term 5	6.4ctd – Nuclear Physics 6.5 – Medical Physics Revision	Retrieval roulette. Practice exam questions.	In order to understand the application of radioactivity in a medical setting, students must first understand the nature of ionising radiation. This topic is covered prior to the medical application section to meet this need. This section of the syllabus demonstrates how developments in medical imagine have led to a wide range of non-invasive techniques that are used in modern medicine. CEIAG: Careers in medical imaging, radiography, sonography and R&D in imaging techniques. PS/CV's: Equipping students with the knowledge to critically analyse the risks & benefits of the use of ionising radiation to diagnose & treat diseases. Understanding of the level of naturally-occuring ionising radiation that we face in everyday life.
Term 6	Revision & final exams	External examinations	