JAMES CALVERT SPENCE COLLEGE

Curriculum Overview

BE KIND
WORK HARD
AIM HIGH

A-level Physics

Year	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
12	**Foundations of physics** During term 1, students will build on concepts taught during the GCSE course to develop their science skills focusing on the use of the international system of units (S.I. units) and their prefixes; the limitations of physical measurements; and the estimation of physical quantities. **Forces and motion** Students will build upon their understanding of forces and motion and will learn more of the SUVAT equations and how to apply these. They will learn how to construct free body diagrams and how to apply Newton's Law to these to determine the motion of objects. They will learn more about moments, momentum, energy and power.		**Forces and motion (continued)** During this term students will develop their understanding of density and Hooke's law and investigate the properties of materials and how to determine their Young's modulus. **Electrons, waves and photons** Students will develop their understanding of charge and current in series and parallel circuits. They will investigate the functions and characteristics of a variety of circuit components, learn how to calculate the internal resistance of a cell and understand what a potential divider does and how it can be used in a variety of applications. Students will revisit longitudinal and transverse waves and learn more about the electromagnetic spectrum. They will look at the phenomena of polarisation, interference, reflection and refraction.		**Electrons, waves and photons (continued)** During the term, students will learn about the photoelectric effect and wave-particle duality. **Thermal physics** Students will further their understanding of thermal physics by looking at what we mean by temperature and the Kelvin scale. They will study the gas laws, ideal gases and the molecular kinetic theory model. They will build upon their understanding of specific heat capacity and specific latent and apply this to a variety of scenarios. *Students will complete the requirements of their required practical endorsement criteria throughout the year.*	
13	**Quantum physics** Students will learn about the photoelectric effect and wave-particle duality. **Thermal physics** They will further their understanding of thermal physics by looking at what we mean by temperature and the Kelvin scale. They will		**Capacitors, electric fields and electromagnetism** Students will deepen their understanding of the motor effect and electromagnetic induction. They will learn what is meant by capacitance and how to calculate it. They will also look at capacitors in series and parallel and the energy stored in them.		Students will spend their time revising preparing for exams. *Students will complete the requirements of their required practical endorsement criteria throughout the year.*	

	study the gas laws, ideal gases and the molecular kinetic theory model. They will build upon their understanding of specific heat capacity and specific latent and apply this to a variety of scenarios. **Circular motion and oscillations** Students will learn how to describe the motion of objects moving in a circular path and how to calculate their variables linked to their motion. They will learn how some objects move with simple harmonic motion, how to perform calculations linked to this. **Gravitational fields, astrophysics and cosmology** Students will expand their knowledge of space when studying this topic. They will build upon their knowledge of fields acquired at GCSE and will learn more details about gravitational and electric fields. They will learn how to calculate a range of factors linked to these fields and compare the two fields.	**Nuclear and particle physics** Students will learn more about radioactive decay and the properties of alpha, beta and gamma radiation. They will learn about nuclear fission and fusion and how to work out the energy produced in these reactions. **Medical physics** Students will have the chance to learn various types of medical imaging including the use of X-rays and ultrasound.	