GCSE Physics Curriculum Overview

Curriculum Overview

Physics is an essential STEAM subject making links between maths, engineering, computing and technology. Studying physics helps us understand the world around us and the world beyond. We have planned an ambitious and broad curriculum that builds upon the key concepts from ks3, and transitions into the Advanced Level Physics. Studying Physics at GCSE and Advanced Level gives a greater understanding of Mechanics, Electronics, electric and magnetic fields, and nuclear and particle physics. Underpinning both KS4 and Ks5 physics is also the consideration of 'How Science Works' and topics to the relevance of physics in Society.

The aims and objectives of the physics curriculum are to enable students to develop:

- essential knowledge and understanding of different areas of physics and how they relate to each other
- and demonstrate a deep appreciation of the skills, knowledge and understanding of physics methods
- competence and confidence in a variety of practical, mathematical and problem-solving skills
- interest in, and enthusiasm for, physics, including developing an interest in further study and careers associated with the subject
- understanding of how society makes decisions about scientific issues linked to physics and how the sciences contribute to the success of the economy and society

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 9	Energy Students will learn how energy stored in a system can change, for example when the object is projected upwards, or it hits an obstacle. Students will learn to calculate the amount of energy associated with a moving object, a stretched spring and an object raised above	Energy The topic of energy is continued. Students will learn about **Temperature changes in a system**. Students will learn and be able to apply the equation for **specific heat capacity.**	Energy Students will learn about **energy resources**, supply and demand, and the environmental impacts of supplying energy to homes and industry.	Electricity Students will learn about **Standard circuit diagram symbols** representing different electrical components. Students will also learn about **electric charge** and how the	Electricity in the home Students will learn about how electricity gets to our homes by learning about the **National Grid.** Students will also learn about **Energy transfers in everyday appliances** and how **Static Electricity** can be formed.	Consolidation of topics learnt this year. End of year assessments.

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	ground level. Students will also learn how energy can be transferred from one form to another and efficiency of a system**.**	*Core practical: Specific Heat Capacity*		**current** of a component depends on the **resistance and potential difference.** *Core practical: Resistance and IV characteristics.*		
Year 10	Particle Model of Matter Students will learn about the **particle models** and use it to explain the behaviour of **solids, liquids and gases** which are used in many everyday applications. Students will learn to apply and calculate the **density** of material. *Core Practical: Density*	Atomic Structure Students will learn about the subatomic particles in the **structure of an atom**, **mass number and atomic number**. Students will extend this knowledge to learn about why **isotopes** exist. Students will also learn about the different types of **radioactive decay** and nuclear power plants.	Forces Students will learn about **scalar and vector quantities,** examples and how they can be represented. Students will expand on their knowledge of forces by learning about **contact and non- contact forces, gravity and resultant forces**. *Core practical: Centre of mass.*	Forces Students will expand their knowledge about Forces by studying motion. This will include plotting and analysing motion graphs.	Forces Students will expand their knowledge about Forces by studying forces in motion. This includes forces and acceleration, weight, terminal velocity, braking and momentum. *Core practical: F=ma*	Students will be reviewing and consolidating what they have learnt so far. Students will sit year 10 exams on topics covered so far. Work experience.
	Waves Students will learn about the different types of **waves**: **Transverse and**	Waves Students will expand on their knowledge of waves to learn	Electromagnetism Students will also learn about **Magnetism and Electromagnetism:**	Space Students will learn about **Space Physics.**	Revision. Students will sit final exams.	Students will sit final exams.

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Year 11	**longitudinal waves and Properties of waves**. Students will learn about Light. Reflection, refraction, and diffusion of light. Lenses and using lenses. *Core practical: Investigating waves in solids and liquids and light*	about the **types of Electromagnetic wave, Properties of Electromagnetic Waves, Uses and applications of Electromagnetic waves.** *Core practical: IR radiation Leslie Cube*	**Permanent and induced magnetism, magnetic forces and fields, The motor effect.**			
Year 12	Working as a physicist Students will learn about the key skills required to be a **successful physicist.** Teacher 1: Mechanics Students will learn about **mechanics**. During this topic they will expand on their prior knowledge of forces and projectile motion. *CORE PRACTICAL 1 - Acceleration of Freefall* Teacher 2: Electricity: Students will study the topic of **electricity**. This	Teacher 1: Mechanics Students will continue their studies of mechanics by learning about Newtons laws of motion, moments, and momentum. Teacher 2: Waves Students will study the topic of **waves and the particle nature of light**. Students will focus on wave properties, interference and diffraction.	Students will sit their mock 1 exam Teacher 1: Materials Students will study the topic of **materials**. Students will focus on the properties of fluids. *CORE PRACTICAL 4 - Falling Ball – viscosity* Teacher 2: Waves Students will continue their study of waves by learning about reflection,	Teacher 1: Materials Students will continue their study of materials looking at Hooke's law and stress/strain graphs. *CORE PRACTICAL 5 - Young modulus* Teacher 2: Waves Students will continue their study of waves, focusing on quantum physics. Students will start their revision and will sit their mock 2 exams.	Revision. Students will sit final exams.	Students will sit final exams. Year 13 start: Teacher 1: Further mechanics Students will build on their **mechanics** knowledge via the topic of **further mechanics** *Core Practical 9 - Force & change in momentum* *Core Practical 10 - ICT to analyse collisions* Teacher 2: Space

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	topic will expand on their prior knowledge of current, voltage, resistance and power. It will also build on their prior knowledge of series and parallel circuits. *CORE PRACTICAL 2 - Resistivity* *CORE PRACTICAL 3 - EMF and internal resistance*	*CORE PRACTICAL 6 - Speed of sound* *CORE PRACTICAL 7 - Frequency of vibrating string*	refraction, lenses and polarisation. *CORE PRACTICAL 8 - Diffraction grating*			Students will study **space** and our universe.
Year 13	Students will learn about **nuclear and particle physics**. Students will then study **nuclear radiation.** This topic builds on students' prior knowledge of radiation and the atom. *CORE PRACTICAL 15 - Absorption of Gamma*	Students will study the topic of **thermodynamics.** *CORE PRACTICAL 12 - Calibrate a Thermistor* *CORE PRACTICAL 13 - Specific Latent Heat* *CORE PRACTICAL 14 - Boyles Law* Students will sit their mock 1 exam.	Students will build on their knowledge of **electricity** in the topic of **electric and magnetic fields.** *CORE PRACTICAL 11 - Use a Datalogger for p.d v C* Students will study **gravitational fields.** Students will study the topic of **oscillations**. *CORE PRACTICAL* 16 - Resonant Frequencies	Students will sit their mock 2 exams. Revision.	Revision. Students will sit final exams.	Students will sit final exams.