



Thomas Mills
High School & Sixth Form

GCSE Physics Curriculum Intent Statement

At Thomas Mills High School, our GCSE Physics curriculum is designed to provide all pupils with a deep understanding of key physical principles, equipping them with the knowledge, skills, and confidence to explain the world around them. Following the OCR A specification, our curriculum builds upon prior learning, ensuring pupils develop scientific literacy and the ability to apply Physics to real-world contexts.

Our intent is to:

Develop Scientific Knowledge and Understanding: We aim to ensure that pupils gain a thorough understanding of core Physics topics, including forces, energy, waves, electricity, radioactivity, and space. These concepts are taught progressively, allowing pupils to make connections between topics and apply their knowledge to new and unfamiliar situations.

Enhance Mathematical, Problem-Solving, and Practical Skills: The study of Physics at GCSE level requires strong mathematical skills, including algebra, ratio, and graph work. We explicitly develop these skills alongside problem-solving strategies, enabling pupils to approach Physics questions logically and systematically. Through required practicals and hands-on investigations, pupils refine their ability to design experiments, collect accurate data, and analyse results critically.

Prepare for A-Level and Beyond: Our curriculum ensures that pupils are well-prepared for further study in Physics and related disciplines, including engineering and other STEM fields. By emphasising the relevance of Physics in modern technology and industry, we inspire pupils to appreciate its significance in shaping the future. Our focus on analytical thinking and scientific inquiry equips pupils with transferable skills that benefit them in further education and beyond.



Unit	Topic	Knowledge and Skills	Useful Links
1	P1: Matter	Knowledge and Understanding Pupils will learn about the history of atomic theory, including key discoveries by Dalton, Rutherford, and Bohr, as well as the particle model of matter, which explains the properties of solids, liquids, and gases. They will develop an understanding of density, including its definition, calculations, and experimental measurements. The concept of changes of state will be explored, covering melting, freezing, boiling, condensing, and sublimation, along with an introduction to internal energy and temperature, highlighting the differences between heat and temperature. Specific heat capacity will be introduced, allowing pupils to explore its formula, calculations, and real-world applications, followed by specific latent heat, where they will learn how energy changes can occur without a change in temperature. Gas pressure and volume will also be investigated, focusing on Boyle's Law and kinetic theory. Skills Development Pupils will develop mathematical skills, including the use of SI units, significant figures, rearranging equations, and interpreting graphs. They will refine their practical skills through experimental work such as measuring density, specific heat capacity, and pressure. In addition, they will enhance their ability to carry out scientific enquiries by designing experiments, collecting and analysing data, and drawing valid conclusions from their results.	Unit: Particle explanations of density and pressure KS4 Combined science Oak National Academy The particle model - GCSE Physics (Single Science) - BBC Bitesize
Assessments		Standardised assessments: Topic Summary Check Lists – Pupils use these to review progress and self-reflect on content taught Online Homework Tasks – Pupils have their own online account with EDUCAKE, and online learning platform.	



		Mid Unit Assessment – An informal task that requires pupils to answer a series of questions in different styles, ranging from multiple choice, calculate and extended writing. End of Unit Test – Formal, in class, exam style assessment on content covered in this unit.	
2	P2: Forces	Knowledge and Understanding Pupils will explore the fundamental principles of motion and forces, starting with speed, distance, and time calculations and their graphical representations. They will develop an understanding of acceleration and learn how to interpret velocity-time graphs. Newton's Laws of Motion will be examined, covering inertia, force, and acceleration, along with an introduction to vectors and scalars to distinguish between quantities with and without direction. Terminal velocity will be discussed in relation to forces acting on falling objects, and the principle of conservation of momentum will be applied to collisions. Pupils will study the concepts of work done and energy transfer using the equation $W = F \times d$ and investigate Hooke's Law by exploring force-extension relationships in elastic materials. They will also learn about weight and gravitational potential energy, kinetic energy calculations using $KE = \frac{1}{2}mv^2$, and how moments, hydraulics, and gears play a role in mechanical systems. Skills Development Pupils will enhance their mathematical skills by practising equation rearrangement, applying SI units correctly, and analysing graphs. Practical skills will be further developed through hands-on experiments involving measuring speed, acceleration, force, and energy transfer. They will gain experience in experimental techniques such as conducting risk assessments, collecting accurate data, investigating forces, and evaluating results to improve scientific inquiry skills.	Forces - GCSE Physics (Single Science) - BBC Bitesize Unit: Measuring and calculating motion KS4 Combined science Oak National Academy Unit: Energy of moving objects KS4 Combined science Oak National Academy Unit: Forces make things change KS4 Combined science Oak National Academy
Assessments			



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