



This year in Physics we will be answering these key questions:		This links to:	Key Vocabulary:	
5P	Core Physics <ul style="list-style-type: none"> What is our universe made from? How do Atoms Interact? How is Energy Stored? How is Energy Transferred? How do Forces Transfer Energy? What makes a good scientific investigation? 	Students should have a basic grasp of the names of some energy stores and pathways, the concept of matter, forces and energy. They will already have seen some of these ideas in the context of everyday examples and spent time doing scientific investigation in years 7 and 8.	<ul style="list-style-type: none"> Mass Atom Charge Proton Neutron Electron Nucleus 	<ul style="list-style-type: none"> Electromagnetic Accelerate Efficiency Power Work Valid Temperature
		Following this topic, the ideas of matter, forces and energy pervade through the rest of the course until the end of year 13 and underpin much of modern scientific thinking.		
6P	The Particle Model of Matter <ul style="list-style-type: none"> How does the particle model of matter help to explain the properties of solids, liquids and gases? What does it mean for a material to be dense? How do particles change as a material changes temperature and changes state? How can we reduce the rate of energy loss out of our homes? How much thermal energy does a hot object store? What is latent heat and how do we calculate it? 	Students should already know that all matter is made up of invisibly small particles interacting by forces. They should be aware of the names and descriptions of the 3 states of matter.	<ul style="list-style-type: none"> Volume Density Displacement Kinetic energy Potential energy Internal energy Conductivity vaporisation, fusion 	<ul style="list-style-type: none"> Temperature Thermal energy Thermometer Insulation Specific heat capacity Change of state Specific latent heat,
		Laying out the particle model at this stage links well to students' own experiences and provides a good grounding for future topics which often reference changes in internal energy, material properties or temperature. Understanding that matter is formed of invisible particles is essential. We build on KS3 particles by increasing the mathematical demand, giving more rigour to explanations and by extending with the idea of latent heat. We will return to the specific heat capacity practical again when we have covered electricity.		
7P	Forces between objects <ul style="list-style-type: none"> How are objects affected by gravity? How do levers change the effect of a force? How does the tension in and energy stored in a spring depend on the length of that spring? Why might a spring not return its original shape?" How much energy does a stretched spring store? How can we describe an object's motion? How do forces affect motion? 	Students should already know that there are contact and non-contact forces acting between objects which are measured in newtons. They also know that forces can alter an object's shape or motion.	<ul style="list-style-type: none"> Newtons Kilograms Gravitational potential energy Centre of mass Gravitational field strength Weight Equilibrium Moment 	<ul style="list-style-type: none"> Extension Limit of proportionality Directly proportional Spring constant Elastic potential energy Speed Velocity Resultant force
		The aim of this unit is to grapple with the nature of the invisible forces between objects and how this can cause energy to be stored by the potential that a force has to do work. We will also begin to unpick how the resultant force on an object affects its motion using Newton's laws. This unit lays the groundwork for GCSE forces, where we apply these principles to cars, crashes and skydivers.		
8P	Mechanical Waves <ul style="list-style-type: none"> "How can we describe waves? How do we measure waves? What happens to a wave when it meets a boundary? How is the reflection of sound useful? How can Seismic waves be useful? 	From 3P in Year 8, students should have a grasp of how waves are made, how sound waves propagate and the meanings of words like frequency, wavelength, reflect and refract.	<ul style="list-style-type: none"> Frequency Oscillate Period Wave speed Hertz Amplitude Wavelength Longitudinal Mechanical Electromagnetic 	<ul style="list-style-type: none"> Compression Rarefaction Reflect Wavefront Refract Ultrasound Boundary Seismic, P-waves S-waves
		Mechanical waves pass on energy by vibrations in a medium. Knowing about the nature of particles and the forces between particles will help to make sense of this. This unit is here to build on what was learnt in year 8 and become more numerate and fluent at describing and measuring waves. All students will return to waves and look more closely at the electromagnetic spectrum in Year 10, with triple award taking this into lenses and colour.		

Target Grade:

AP1:

AP2:

AP3: