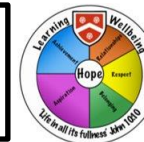




Academic Learning Plan 2023-2024

Year 9 science

Intent : Science in year 9 intends: to build on student’s enthusiasm and excitement from earlier in Year 7 and 8 and build on the skills required to achieve at GCSE. We aim to introduce them to the fundamental skills needed to do well at GCSE with the core concepts of GCSE as well as the practical skills they need to achieve.



Year 9 Units	Term 1	Term 2	Term 3
	Maths Skills Unit – preparation for GCSE mathematical concepts	B1 - Cells (a-d)	B1 - Enzymes and Food Tests (e-h)
Biology Concepts	<ul style="list-style-type: none"> Standard Form used for cell size, magnification equations Graph Skills Frequency Percentages 	<p>In this unit you will learn:</p> <ul style="list-style-type: none"> how developments in microscopy have allowed us to find out more about the sub-cellular structures found in plant, animal and bacterial cells about the importance of enzymes in nutrition, growth and development how enzymes are affected by pH and temperature and why each enzyme only works on a certain type of molecule how to carry out food tests and calorimetry 	<p>In this unit you will learn:</p> <ul style="list-style-type: none"> how developments in microscopy have allowed us to find out more about the sub-cellular structures found in plant, animal and bacterial cells about the importance of enzymes in nutrition, growth and development how enzymes are affected by pH and temperature and why each enzyme only works on a certain type of molecule how to carry out food tests and calorimetry
Year 9 Units	Term 4	Term 5	Term 6
	B1 - Transport across membranes (i-j)	B5 - Health and Disease pt 1 (a-e)	B5 - Health and Disease pt 1 (f - k) & Catch up
	<p>In this unit you will learn:</p> <ul style="list-style-type: none"> how developments in microscopy have allowed us to find out more about the sub-cellular structures found in plant, animal and bacterial cells about the importance of enzymes in nutrition, growth and development how enzymes are affected by pH and temperature and why each enzyme only works on a certain type of molecule how to carry out food tests and calorimetry how substances are carried by diffusion, osmosis and active transport. 	<p>In this unit you will learn:</p> <ul style="list-style-type: none"> about how we define health about some pathogens, the diseases they cause, and how their spread can be reduced or prevented 	<p>In this unit you will learn:</p> <ul style="list-style-type: none"> about how we define health about some pathogens, the diseases they cause, and how their spread can be reduced or prevented about the lifecycle of viruses how plants defend themselves from pests and pathogens how the body is protected against infection about the immune system how antibiotics work about aseptic techniques for culturing microorganisms how new medicines are developed

Year 9 Units	Term 1	Term 2	Term 3
	Maths Skills Unit – preparation for GCSE mathematical concepts	P14 - Molecules and Matter	P1 - Motion
Physics Concepts	<ul style="list-style-type: none"> Standard Form used for dimensions in space, speed of light rearranging equations Graph Skills Percentages SI units 	<p>In this unit you will learn:</p> <ul style="list-style-type: none"> how to explain different densities of substances and how to calculate density 	<p>In this unit you will learn:</p> <ul style="list-style-type: none"> the difference between vector and scalar quantities how to calculate speed and acceleration how to represent journeys on distance/time and velocity/time graphs how to use graphs to calculate speed, acceleration and distance travelled.
Year 9 Units	Term 4	Term 5	Term 6
	P2 - Newton's Laws	P3 - Energy	P3 – Energy Resources & Catch up
	<p>In this unit you will learn:</p> <ul style="list-style-type: none"> about Newton's Laws of Motion how to calculate the weight of an object from its mass about the factors that affect the stopping distance of a vehicle how to use ideas about energy transfers to calculate braking distances about the dangers of large decelerations H how to calculate momentum, and apply ideas about momentum to collisions. 	<p>In this unit you will learn:</p> <ul style="list-style-type: none"> how energy is stored and transferred how to represent energy transfers using diagrams how to calculate efficiency how to reduce transfers of wasted energy how to calculate the amount of gravitational potential energy or kinetic energy stored in objects about the different renewable and non-renewable resources we use to make electricity, for heating and cooking, and for transport. 	<p>In this unit you will learn:</p> <ul style="list-style-type: none"> how energy is stored and transferred how to represent energy transfers using diagrams how to calculate efficiency how to reduce transfers of wasted energy how to calculate the amount of gravitational potential energy or kinetic energy stored in objects about the different renewable and non-renewable resources we use to make electricity, for heating and cooking, and for transport.

Year 9 Units	Term 1	Term 2	Term 3
	Maths Skills Unit – preparation for GCSE mathematical concepts	C3 Atomic Structure	C4 Periodic Table
Chemistry Concepts	<ul style="list-style-type: none"> Standard Form used for atoms. Mole's equations Graph Skills Rates Percentages 	<p>In this unit you will learn:</p> <ul style="list-style-type: none"> how our ideas about atoms have changed what a relative atomic mass is H how to calculate relative atomic mass for an element. 	<p>In this unit you will learn:</p> <ul style="list-style-type: none"> how Mendeleev arranged the elements known at the time in a periodic table how Mendeleev predicted the existence and properties of undiscovered elements how Henry Moseley helped to confirm Mendeleev's ideas how the elements are arranged in the modern periodic table how to use the periodic table to predict and model the arrangement of electrons in atoms.

Year 9 Units	Term 4	Term 5	Term 6
	C20 - Earth's Atmosphere	C18 - Rates	C19 -Energy in Reactions
	<p>In this unit you will learn:</p> <ul style="list-style-type: none"> about how the Earth's atmosphere has changed in the past and how it is changing now more about the causes and effects of climate change. 	<p>In this unit you will learn:</p> <ul style="list-style-type: none"> how changes in conditions can affect the rates of reactions about the energy transfers that can occur during chemical reactions. 	<p>In this unit you will learn:</p> <ul style="list-style-type: none"> how changes in conditions can affect the rates of reactions about the energy transfers that can occur during chemical reactions.

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Literacy	Key Mathematical Terms defined in books	B1 Key Concepts C3 & C4 atoms & Elements P14 & P15 Particles	B1 Key Concepts C3 & C4 atoms & Elements P1 Motion	B1 Key Concepts C20 Earth's Atmosphere P2 Forces & Motion	B5 Health & Disease C18 Rates P3 Conservation of Energy	B5 Health & Disease C19 Energy in Reactions P3 Energy Resources
Knowledge organiser	Mathematical Skills & How Science Works	B1 Key Concepts C3 & C4 atoms & Elements P14 & P15 Particles	B1 Key Concepts C3 & C4 atoms & Elements P1 Motion	B1 Key Concepts C20 Earth's Atmosphere P2 Forces & Motion	B5 Health & Disease C18 Rates P3 Conservation of Energy	B5 Health & Disease C19 Energy in Reactions P3 Energy Resources
Assessment	There will be a combined assessment of the 3 units completed per term once these units have been taught. This will be completed when the teacher feels the students are ready					The end of year assessment grade will be based on an average of the assessments throughout the year.
GCSE AO Link (or other) if applicable	<p>In science the assessment objectives are:</p> <p>AO1 Demonstrate knowledge and understanding.</p> <p>AO2 Apply knowledge and understanding.</p> <p>AO3 Analyse information and ideas.</p> <p>These are all covered in each block of three modules.</p>					
Homework	One piece of homework per week, for up to 45 minutes . Tasks to include, key word tasks, reading comprehension, quizzes and assessment questions					
CEIAG- STEM careers that link to these topics:	Microbiologist Hydrologist Analytical Chemist Nutritionist Power plant specialist	Physiotherapist Chemist Pharmacology Electrician	Vet Quantum physicist Meteorologist Mechanical Engineer	Ecologist Sound engineer	Botanist Submariner Marine Engineer	
Enrichment	Students begin to look at GCSE concepts...Year 9 to be offered the chance to become Stem ambassadors moving forward					