

Curriculum Overview: Science

Year	7	8	9	10	11		
Stage	Building on KS2 Foundations	Building and developing	Developing and embedding	Embedding and applying	Applying and Practise		
	Pupils are introduced to the basic scientific skills and invaluable knowledge they will need to use throughout the next five years, to access the GCSE specification and better understand the world around them. They will gain knowledge and understanding of the key ideas (cells, forces, particles and energy) in science.	Pupils will continue to develop and build on the skills and invaluable knowledge introduced in Year 7. They will gain a more in-depth knowledge and understanding of the key ideas (cells, forces, particles and energy) in science.	Pupils will continue developing their skills and invaluable knowledge linked to the key science ideas and begin to embed them to prepare for the GCSE curriculum.	Having successfully acquired the skills and invaluable knowledge needed pupils will begin to deepen their scientific understanding of the key ideas and scientific skills and apply them to the GCSE curriculum. This will also allow pupils to fine tune their skills to enable them to answer GCSE exam questions	During Year 11 pupils will complete their study of the key GCSE curriculum and review the required practicals in the GCSE curriculum. They will continue to practice exam techniques using the skills and invaluable knowledge they have acquired over the five years of study		
Implementation	Term	1	<p><b>Substances and Particles</b> Pupils will understand what all matter is made up of, how different substances have different properties and that these can be used for different uses. Pupils will also be taught about laboratory safety, equipment and learn vital practical skills during this topic which they will then use throughout their science lessons.</p>	<p><b>Organisms and their environment</b> This topic again builds on from the knowledge gained at KS2. It focusses on habitats, communities and feeding relationships within these habitats and ecosystems. It then moves on to look at how organisms have adapted and evolved over time</p>	<p><b>Transport in cells, tissues and organs</b>  During this topic pupils will build on their knowledge of cells and how the body is organised to understand how important substances needed to live are moved around the body by different organs and organ systems including the digestive system and the heart.</p>	<p><b>Ecology</b> This topic builds on invaluable knowledge of habitats and feeding relationships from KS3 and then focusses on the world around us and how our actions can have an impact on the world including climate change, increasing populations, deforestation and pollution.  <b>Infection and response</b> In this topic pupils will understand diseases and how they are caused, spread and how to reduce the risk of infection.</p>	<p><b>Inheritance, variation, and evolution</b> This topic looks at how organisms have evolved through the idea of survival of the fittest and how and why some organisms are extinct. It also focusses on how reproduction allows for the inheritance of genes, and how some disorders can be inherited. This topic also looks at how the farming industry uses selective breeding and genetic engineering to produce food.</p>
		2	<p><b>Cellular basis of life</b> Cells are the basic units of life, studying this topic will give a better understanding of how all living things live and the systems that they are made of.</p>	<p><b>Elements and the periodic table</b> This topic builds on knowledge from Year 7 about substances and starts to look at what an element is, how it can be represented using symbols and how they are arranged in the periodic table. This topic also helps pupils to understand that scientific models develop over time and that things can change in the light of new evidence is an important concept.</p>	<p><b>Forces and elasticity</b> This topic builds on the idea of forces and energy and looks at pressure in fluids, how to calculate it and how it can be used in our everyday lives and springs. This topic also looks at what levers are and how they make our lives easier by reducing the amount of work done or energy transferred.</p>	<p><b>Rates of reaction and extent of change</b> In this topic pupils will focus on how the rate of a chemical reaction can be altered to make the product quicker and why this might be useful in industry.</p>	<p><b>Quantitative Chemistry</b> During this topic pupils will use their maths skills to calculate chemical masses and use calculations to calculate the amount of reactants needed or products made during a reaction. <b>Electrolysis</b> This topic looks at how compounds can be separated or purified using electricity <b>Energy changes</b> This topic builds on the invaluable knowledge learnt in KS3 about energy and energy transfers and how this happens in chemical reactions and how these can be useful in our everyday lives.</p>
		3	<p><b>Forces and motion</b> Forces are all around us and affect everything we do. This topic looks at what forces can do to objects and it also looks at energy and energy transfers linked to forces.</p>	<p><b>Health and disease</b> This topic builds on knowledge from KS2 focussing on how a healthy lifestyle and life choices can affect a person's physical, social and mental well-being. The topic looks at what a balanced diet is, how to test for different food groups in the laboratory. It also looks at the effects of drugs, alcohol and smoking have on the body and what communicable diseases are and how they are caused.</p>	<p><b>Atoms, the periodic table, chemical analysis and bonding</b> During this topic pupils will build on their knowledge of atoms and chemical reactions to understand how chemicals bonds and use this to explain many of the chemical and physical properties of substances and chemical phenomena. Pupils will also learn how to identify chemical substances using a range of analytical techniques.</p>	<p><b>Homeostasis and response</b> This topic focusses on how our body protects itself using internal regulatory systems and reflex actions. It also looks at diabetes and how to protect ourselves from sexually transmitted infections and unwanted pregnancies.</p>	<p><b>Newton's Laws</b> In this topic pupils will review their knowledge of forces and learn how these are linked to Newton's laws and examples can be found everywhere we look  <b>Required practical revision</b> Pupils will have the opportunity to practise the required practical needed for their GCSE exams including chromatography, energy transfers, food test, field work skills specific heat capacity of materials and acceleration.</p>
		4	<p><b>Chemical Reactions</b> This topic looks at how new compounds and materials are made. It looks at metals and non-metals and how they react, and what acids and alkalis are and how they are used in everyday life.</p>	<p><b>Electricity and magnets</b> Electricity plays an important role in all our lives during this topic pupils will learn what an electrical current and voltage are as well as how to make electrical circuits. They will learn what magnets are and how they are used in our everyday lives.</p>	<p><b>Atoms, the periodic table, chemical analysis and bonding</b> During this topic pupils will build on their knowledge of atoms and chemical reactions to understand how chemicals bonds and use this to explain many of the chemical and physical properties of substances and chemical phenomena. Pupils will also learn how to identify chemical substances using a range of analytical techniques.  <b>Health, disease, infection and response</b> This topic builds on knowledge from KS2 focussing on how a healthy lifestyle and life choices can affect a person's physical, social and mental well-being. It also looks at what communicable diseases are, how they are caused, how they can be prevented and what vaccinations are.</p>	<p><b>Magnetism and electromagnetism</b> In this topic pupils will build on their knowledge of magnetism and learn how they are used in our everyday lives.</p>	<p>Revision and intervention to address weaknesses identified from assessments</p>
		5	<p><b>Matter</b> This topic builds on the ideas of particles and substances from earlier in the year to develop understanding of energy transfers in particles and pressure. <b>The solar system</b> This topic builds on knowledge from KS2 and looks at the universe, the moon, planets and the difference between mass and weight.</p>	<p><b>Chemical energetics</b> This topic builds on the invaluable knowledge learnt in year 7 about energy and energy transfers and how this happens in chemical reactions. They will also investigate how these reactions can be useful in our everyday lives.  <b>Inheritance and variation</b> During this topic pupils will build on their knowledge of cells and learn how characteristics are passed on from parent to offspring and why this is important for survival.</p>	<p><b>Health, disease, infection and response</b> This topic builds on knowledge from KS2 focussing on how a healthy lifestyle and life choices can affect a person's physical, social and mental well-being. It also looks at what communicable diseases are, how they are caused, how they can be prevented and what vaccinations are.  <b>Organic chemistry and rates of reaction</b> This topic looks at how we can separate a useless mixture (crude oil) to get a variety of useful products we use everyday. It will also focus on</p>	<p><b>Using resources</b> In this topic pupils will understand that all the Earth's resources are finite and how we can reduce the use of these resources.</p>	<p>Revision and intervention to address weaknesses identified from assessments</p>

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		<b>6</b>	<p><b><u>Organisms and their environment</u></b> This topic again builds on from the knowledge gained at KS2. It focusses on habitats, communities and feeding relationships within these habitats and ecosystems. It then moves on to look at how organisms have adapted and evolved over time.</p>	<p><b><u>Pressure, moments, and energy</u></b> This topic builds on the idea of forces and energy and looks at pressure in fluids, how to calculate it and how it can be used in our everyday lives. This topic also looks at what levers are and how they make our lives easier by reducing the amount of work done or energy transferred.</p>	<p><b><u>Organic chemistry and rates of reaction</u></b> This topic looks at how we can separate a useless mixture (crude oil) to get a variety of useful products we use every day. It will also focus on how the rate of a chemical reaction can be altered to make the product quicker and why this might be useful in industry.</p>	<p><b><u>Particle model of matter</u></b> The particle model is widely used to predict the behaviour of solids, liquids and gases and this has many applications in everyday life. It helps us to explain a wide range of observations and engineers use these principles when designing vessels to withstand high pressures and temperatures, such as submarines and spacecraft.</p>	