


Year 9 Overview						The year 9 science journey continues to follow the 10 big ideas of science. It will revisit and build on units that have been covered in years 7 and 8.					
	Trinity 2		Michaelmas 1		Michaelmas 2		Lent 1		Lent 2		Trinity 1
Topic/Big Question	June Types of reactions	July Earth's resources and climate	Sept Photosynthesis and respiration	Oct Magnetism	Nov Work, heating and cooling	Dec Evolution and inheritance	Jan Waves	Feb Cell Biology - Structure Atomic structure	Mar Energy Organisation - Health	Apr Cell biology - Transport Periodic table	May Energy Organisation - Tissues
Theme(s)	Reactions	Earth	Ecosystems	Electromagnetism	Energy	Genes	Waves	Organisms Matter	Energy Organisms	Organisms Matter	Energy Organisms
Key Knowledge	<ul style="list-style-type: none"> <li>what happens to the particles during a chemical reaction</li> <li>conservation of mass</li> <li>the products of combustion and thermal decomposition</li> <li>exothermic and endothermic reactions and how to represent them in energy level diagrams.</li> </ul> 	<ul style="list-style-type: none"> <li>impact of human activity on the atmosphere</li> <li>the importance of the carbon cycle</li> <li>the ways that we use the Earth's resources and how we can reduce this to preserve them</li> <li>polymers, composite materials and ceramics</li> </ul>	<ul style="list-style-type: none"> <li>aerobic and anaerobic respiration</li> <li>the effects of exercise of respiration and respiration in yeast</li> <li>the process of photosynthesis</li> <li>how to prove photosynthesis has occurred</li> <li>how to measure the rate of photosynthesis and the adaptations that enable the process to be efficient</li> </ul>	<ul style="list-style-type: none"> <li>properties of magnets, magnetism and magnetic fields</li> <li>electromagnets and investigate how to increase their strength and how this links to their uses.</li> </ul>	<ul style="list-style-type: none"> <li>simple machines</li> <li>measuring the work done</li> <li>energy and temperature</li> <li>the processes of conduction convection and radiation.</li> </ul>	<ul style="list-style-type: none"> <li>the process of natural selection and how it leads to evolution</li> <li>extinction and methods to preserve biodiversity</li> <li>the structure of DNA, genetics, inheritance and genetic modification.</li> </ul>	<ul style="list-style-type: none"> <li>key properties of waves</li> <li>how microphones and loudspeakers use waves</li> <li>ultrasound</li> <li>the electromagnetic spectrum</li> <li>the uses of the different waves in the spectrum and what happens when waves interact with each other.</li> </ul>	<ul style="list-style-type: none"> <li>the structure of animal and plant cells</li> <li>the function of cell organelles</li> <li>the differences between eukaryotic and prokaryotic cells</li> <li>the use of microscopes</li> <li>specialised cells</li> <li>stem cells and their uses</li> <li>the process of mitosis.</li> <li>representing reactions through equations</li> <li>the structure of the atom</li> <li>electron arrangement isotopes</li> <li>the development of the atomic model.</li> </ul>	<ul style="list-style-type: none"> <li>different energy stores</li> <li>pathways between stores</li> <li>energy dissipation and efficiency</li> <li>energy resources and how to prevent energy transfer in homes.</li> <li>levels of organisation in living organisms</li> <li>the components of blood</li> <li>the blood vessels</li> <li>structure of the heart</li> <li>heart diseases and treatments</li> <li>types, causes and effects of cancer.</li> </ul>	<ul style="list-style-type: none"> <li>movement of substances in cells through diffusion, osmosis and active transport.</li> <li>exchange surfaces and their adaptations</li> <li>development of the periodic table</li> <li>the properties of the elements in groups 1, 7, 0 and the transition metals.</li> </ul>	<ul style="list-style-type: none"> <li>amount of energy in kinetic stores, gravitational stores, elastic stores and thermal stores</li> <li>work done, power and how these link to energy.</li> <li>the digestive system</li> <li>nutrients in a balanced diet</li> <li>the role of enzymes in digestions</li> <li>structure of plants</li> <li>the movement of substances through transpiration and translocation.</li> </ul>
Key Skills	How to collect data and analyse it to allow them to draw suitable conclusions, use scientific models and key vocabulary to explain scientific concepts.	Use scientific vocabulary, models and diagrams to explain scientific concepts, evaluate the impact of human activities and discuss the methods that are being used to tackle these issues.	Identify variables in an investigation, collect data, analyse data and make conclusions, link observations to key substantive knowledge.	Identify variables in an investigation, collect data, analyse data and make conclusions, use scientific models and key vocabulary to explain scientific concepts.	Identify variables, collect and analyse data to allow them to draw suitable conclusions, use scientific models and key vocabulary to explain scientific concepts.	Use scientific models and key vocabulary to explain scientific concepts, explain how models and theories change over time with new evidence and the importance of peer review.	Recognise, interpret and construct wave diagrams and draw conclusions from them, use scientific models and key vocabulary to explain scientific concepts.	Use scientific models, diagrams and key vocabulary to explain scientific concepts, identify variables in an investigation, collect data, analyse data to draw conclusions, consider the ethical arguments surrounding scientific developments.  Identify variables in an investigation, collect data, analyse data and make conclusions, use scientific models, diagrams and key vocabulary to explain scientific concepts and link observations to key substantive knowledge, evaluate the advantages and disadvantages of scientific developments.	Identify variables in an investigation, collect data and analyse data to make a conclusion, make repeatable measurements, use an appropriate number of significant figures, calculate mean averages and use a range of mathematical techniques to enable them to answer a scientific question. Use SI units and to convert measurements when necessary, use scientific models, diagrams and key vocabulary to explain scientific concepts and link observations to key substantive knowledge.	Use scientific models, diagrams and key vocabulary to explain scientific concepts, identify variables in an investigation, collect data, analyse data to draw conclusions, consider the ethical arguments surrounding scientific developments.  Identify variables in an investigation, collect data, analyse data and make conclusions, use scientific models, diagrams and key vocabulary to explain scientific concepts and link observations to key substantive knowledge, evaluate the advantages and disadvantages of scientific developments.	Identify variables in an investigation, collect data and analyse data to make a conclusion, make repeatable measurements, use an appropriate number of significant figures, calculate mean averages and use a range of mathematical techniques to enable them to answer a scientific question. Use SI units and to convert measurements when necessary, use scientific models, diagrams and key vocabulary to explain scientific concepts and link observations to key substantive knowledge.  Identify variables in an investigation, collect data, analyse data and make conclusions, use scientific models, diagrams and key vocabulary to explain

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