



<b>KS2</b>	<p><b>Animals, humans &amp; plants-</b> Pupils gain an understanding of major organs in plants and animals, systems including respiratory, circulatory, digestive, skeletal and reproductive. Pupils also explore classifying organisms. Pupils gain an understanding of inheritance and inherited traits as well as the discovery of fossils to link with evolution</p> <p><b>Interactions &amp; energy-</b> Pupils gain an understanding of communities, factors affecting habitats, changes in the environment, food chains, health and nutrition.</p>	<p><b>Earth &amp; Systems-</b> Pupils gain an understanding of physical properties of solids, liquids and gases, including properties of rocks and the rock cycle,</p> <p><b>Matter-</b> Builds upon properties of everyday materials studied in KS1 and links to the states of matter and processes such as freezing, boiling, condensation and evaporation. This is built on later in KS2 when pupils study dissolving, separating techniques, reversible changes.</p>	<p><b>Energy-</b> Pupils gain an understanding of Light in terms of reflection, structure of the eyes, shadow formation. In sound pupils explore how sounds is made, how it travels and the difference between amplitude and frequency relating to volume and pitch of sound. Lots of the content is put into context using musical instruments as examples. Electricity is studied later on as it is more conceptually difficult where pupils explore basic circuits and components</p> <p><b>Forces-</b> Pupils gain an understanding of Earth &amp; Space and gravity as a non-contact force, Earth's rotation- day and night, our solar system and spherical bodies. This unit also links to seasonal changes in Biology. Pupils also study Magnetism- attraction and repulsion, contact forces such as friction and using forces in levers, pulleys and gears</p>	<p><b>Asking questions-</b> Pupils can ask relevant questions and plan different types of enquiry to answer questions, recognising and controlling variables</p> <p><b>Test Hypotheses-</b> Pupils can set up simple practical enquiries, making systematic and careful observations and take accurate measurements using standard units, use a range of equipment including thermometers and dataloggers</p> <p><b>Gathering &amp; Recording-</b> Pupils can record findings, use simple scientific language in diagrams, bar charts and tables and present data in a variety of ways to help answer scientific questions</p> <p><b>Analysis-</b> Pupils can use test results to make further predictions and use scientific evidence to support or refute arguments</p> <p><b>Communication-</b> Pupils can report and present findings from enquires including conclusions, causal relationships and explanations and a degree of trust in results, in oral and written forms</p>
<b>KS3</b>	<b>Biology</b>	<b>Chemistry</b>	<b>Physics</b>	<b>Working Scientifically</b>
	<b>Students apply their deep knowledge to unfamiliar contexts</b>			
<b>Transfer knowledge and skills</b>	<p>Possible unfamiliar contexts include:</p> <ul style="list-style-type: none"> <li>Chlamydomonas, Euglena, Paramecium- identifying as plan or animal cells or identifying organelles in unfamiliar cells</li> <li>Interpretation of physiological data e.g. heart rate, breathing rate etc</li> <li>Energy and efficiency of unfamiliar food chains</li> <li>Predator-prey interpretation or population changes based on unfamiliar food web/chain</li> <li>Suggest adaptations of an unknown organism</li> <li>Applying knowledge of human reproduction to other mammals</li> <li>Evaluating government strategies on promoting healthy eating</li> </ul>	<p>Possible unfamiliar contexts include:</p> <ul style="list-style-type: none"> <li>Correctly constructing the formula of an unknown substance when given a model and key to use</li> <li>Suggest melting points for unknown substances based on unfamiliar data or information</li> <li>Suggest a separation technique for an unfamiliar substance</li> <li>Suggest products or reactants of an unfamiliar reaction</li> <li>Suggest an order of reactivity/ reactivity of unfamiliar element(s)</li> <li>Balance unfamiliar equations</li> <li>Applying conservation of mass to reactions that contradict it</li> </ul>	<p>Possible unfamiliar contexts include:</p> <ul style="list-style-type: none"> <li>Selecting/ identifying an equation and using it correctly in a calculation</li> <li>Suggesting pathways of light when given an unfamiliar object</li> <li>Applying knowledge of electromagnets to unseen situations e.g. car park barrier, children's mobile toy, church bell</li> <li>Correctly interpret distance time graph for unseen contexts</li> <li>Suggest how energy can be conserved in an unfamiliar example</li> </ul>	<p>Possible unfamiliar contexts include:</p> <ul style="list-style-type: none"> <li>Different method used for a particular practical</li> <li>Alternative equipment used and reason why</li> <li>Determining values using a graph e.g. gradients, extrapolation and predicting values</li> <li>Successfully drawing conclusions from unfamiliar practical work</li> <li>Suggesting a prediction for unfamiliar practical work</li> <li>Suggest how to improve the accuracy of results</li> <li>Suggest how to improve reliability of results</li> </ul>
<b>Deep Knowledge and skills</b>	<ul style="list-style-type: none"> <li>Understand the interdependence of organisms in a food chain/ web</li> <li>Describe key processes in plants and animals (e.g. respiration, photosynthesis, digestion)</li> <li>Describe how and why individual</li> <li>Explain how lifestyle choices can affect health and behaviour</li> <li>Description of differences between species</li> <li>Explain how changes in the environment can lead to evolution/ extinction</li> </ul>	<ul style="list-style-type: none"> <li>Describe different methods in which mixtures can be separated</li> <li>Understand how elements and compounds can react (e.g. combustion, decomposition, acid-base)</li> <li>Understand energy transfers during reactions</li> <li>Understand how metals react differently, linked to their method of extraction</li> <li>Describe how rock and carbon cycles affect other organisms and the environment</li> </ul>	<ul style="list-style-type: none"> <li>Describe how energy is transferred from one store to another and how it is conserved</li> <li>Explain how energy is used in a domestic context</li> <li>Evaluate energy resources</li> <li>Measure current and potential difference in different types of circuit</li> <li>Describe the properties of light and sound waves and how they are detected by the body</li> <li>Describe how forces can affect objects through direct contact and from a distance</li> <li>Describe relationships between the Sun and Earth (e.g. seasons, day and night and light years)</li> <li>Be able to perform calculations when given the equation</li> </ul>	<ul style="list-style-type: none"> <li>Evaluate investigative methods and apparatus</li> <li>Present reasoned explanations</li> <li>Understand how scientific theories/ models are developed over time</li> <li>How to use and derive simple equations and calculate results (including anomalies)</li> <li>Appreciate what constitutes reliable data</li> <li>Constructing graphs from data</li> <li>Reading values off a graph</li> <li>Explaining why variables need to be controlled</li> <li>Describing trends on a graph</li> </ul>
<b>Surface Knowledge and skills</b>	<ul style="list-style-type: none"> <li>Identify key elements of food chains</li> <li>Have an understanding of structure and function of cells and organ systems</li> <li>Know the components of a healthy diet</li> <li>Have an understanding of DNA and its organisation into genes and chromosomes</li> </ul>	<ul style="list-style-type: none"> <li>Show an understanding of the particle model of matter and simple atomic structure</li> <li>Understand differences between element, compound and mixtures</li> <li>Understand differences between pure and impure substances</li> <li>Be familiar with the Earth's structure and types of rocks</li> </ul>	<ul style="list-style-type: none"> <li>Identify different energy stores and resources</li> <li>How to use the words charge, current, potential difference, electron, resistance in the context of current electricity</li> <li>Identify waves as transverse or longitudinal</li> <li>Identify different types of forces</li> <li>Describe important celestial bodies in the Universe</li> </ul>	<ul style="list-style-type: none"> <li>Record observations and identify correlations in data</li> <li>Show an understanding of variables and controlling variables where appropriate</li> <li>Undertake basic data analysis</li> <li>Show an understanding of basic calculation and equations</li> <li>Plotting data on given axes</li> <li>Identifying basic trends on a graph</li> </ul>