


**SUBJECT: SCIENCE**

Year Group	YEAR 10					
Rationale	Students build on the content studied in key stage three. Pupils continue to develop their knowledge and understanding of Biology, Chemistry and Physics, tackling more challenging concepts to a greater depth than they have done previously. Students continue to develop scientific skills, directly linked to the required practicals including forming hypotheses, writing methods, using scientific equipment effectively as well as presenting and analysing results. Pupils will also continue to develop their understanding of the key scientific terms related to working scientifically. Pupils work through the units in rotation during the course of the year.					
	Autumn Term 1	Autumn Term 2	Spring Term 1	Spring Term 2	Summer Term 1	Summer Term 2
Topic/Unit	<b>Biology:</b> Cell Biology  <b>Chemistry:</b> Atomic Structure & the Periodic Table <b>Physics:</b> Energy	<b>Biology:</b> Organisation  <b>Chemistry:</b> Bonding, Structure & the Properties of Matter  <b>Physics:</b> Electricity	<b>Biology:</b> Infection & Response  <b>Chemistry:</b> Quantitative Chemistry	<b>Biology:</b> Bioenergetics  <b>Chemistry:</b> Chemical Changes <b>Physics:</b> Particle Model of Matter	<b>Chemistry:</b> Electrolysis & Energy changes  <b>Physics:</b> Atomic Structure	<b>Biology:</b> Ecology  <b>Chemistry:</b> The Rate & Extent of Chemical Change
Knowledge	<b>Biology</b> <ul style="list-style-type: none"> <li>Animal, Plant and Bacterial Cells</li> <li>Cell Specialisation and Differentiation</li> <li>Using Microscopes</li> <li>Cell Division and Mitosis</li> <li>Stem Cells</li> <li>Transport in Cells</li> </ul> <b>Chemistry</b> <ul style="list-style-type: none"> <li>Atomic Structure</li> <li>Chemical Formula</li> <li>Separating Mixtures</li> <li>Atoms, Ions and Isotopes</li> <li>Development of the Atom</li> <li>The Periodic Table</li> <li>History of the Periodic Table</li> <li>Balancing Symbol Equations</li> </ul> <b>Physics</b> <ul style="list-style-type: none"> <li>Energy Stores</li> <li>Energy Transfers</li> <li>Conservation and Dissipation of Energy</li> <li>Thermal Conductivity</li> <li>National and Global Energy Resources</li> </ul>	<b>Biology</b> <ul style="list-style-type: none"> <li>Animal Tissues, Organs and Organ Systems</li> <li>Digestive System and Enzymes</li> <li>Food Tests</li> <li>Heart and Blood Vessels</li> <li>Blood</li> <li>Heart Disease</li> </ul> <b>Chemistry</b> <ul style="list-style-type: none"> <li>States of Matter</li> <li>Ionic Bonding</li> <li>Covalent Bonding</li> <li>Fullerenes and Graphene</li> <li>Metallic Bonding</li> <li><i>Nanoparticles (Chemistry Only)</i></li> </ul> <b>Physics</b> <ul style="list-style-type: none"> <li>Current, Potential Difference and Resistance</li> <li>Series and Parallel Circuits.</li> <li>Ohm's Law</li> <li>Domestic Uses and Safety</li> <li>Electrical Energy Transfers.</li> <li><i>Static Electricity (Physics only).</i></li> </ul>	<b>Biology</b> <ul style="list-style-type: none"> <li>Health and Non-Communicable Diseases</li> <li>Pathogens and Communicable Diseases</li> <li>Defence against Disease</li> <li>Treatment of Disease</li> <li>Cancer</li> <li>Developing Drugs and Drug Trials</li> <li><i>Culturing Micro-organisms (Biology Only)</i></li> <li><i>Plant Diseases and Defences (Biology Only)</i></li> <li><i>Monoclonal Antibodies (Biology Only)</i></li> </ul> <b>Chemistry</b> <ul style="list-style-type: none"> <li>Isotopes</li> <li>Conservation of Mass</li> <li>Relative Formula Mass</li> <li>Moles</li> <li>Limiting Reactants</li> <li>Concentration</li> </ul>	<b>Biology</b> <ul style="list-style-type: none"> <li>Plant Tissues, Organs and Organ Systems</li> <li>Transport in Plants</li> <li>Photosynthesis</li> <li>Aerobic Respiration</li> <li>Anaerobic Respiration</li> <li>Metabolism</li> </ul> <b>Chemistry</b> <ul style="list-style-type: none"> <li>Reactivity of Metals</li> <li>Oxidation and Reduction</li> <li>Extraction of Metals</li> <li>Metal and Acid Reactions</li> <li>Acids, Alkalis and pH Scale</li> <li>Neutralisation</li> <li>Making Soluble Salts</li> </ul> <b>Physics</b> <ul style="list-style-type: none"> <li>Changes of State and the Particle Model.</li> <li>Density.</li> <li>Internal Energy.</li> <li>Specific Heat Capacity and Specific Latent Heat.</li> <li>Particle Model and Pressure.</li> <li><i>Pressure in Gases (Physics only).</i></li> </ul>	<b>Chemistry</b> <ul style="list-style-type: none"> <li>Electrolysis</li> <li>Endothermic and Exothermic Reactions</li> <li>Reaction Profile Diagrams</li> <li>Bond Energies</li> <li><i>Chemical Cells and Batteries (Chemistry Only)</i></li> <li><i>Fuel Cells (Chemistry Only)</i></li> </ul> <b>Physics</b> <ul style="list-style-type: none"> <li>Atoms and Isotopes.</li> <li>Nuclear Radiation.</li> <li><i>Hazards and Uses of Radiation (Physics only).</i></li> <li><i>Background Radiation (Physics only).</i></li> <li><i>Nuclear Fission and Fusion (Physics only).</i></li> </ul>	<b>Biology</b> <ul style="list-style-type: none"> <li>Ecosystems and Feeding Relationships</li> <li>Biotic and Abiotic Factors</li> <li>Plant and Animal Adaptations</li> <li>Using Quadrats and Transects</li> <li>Water and Carbon Cycle</li> <li>Biodiversity and Waste Management</li> <li>Deforestation</li> <li>Peat Bogs</li> <li>Global Warming</li> <li><i>Decomposition (Biology Only)</i></li> <li><i>Impact of Environmental Change (Biology Only)</i></li> <li><i>Trophic Levels and Pyramids of Biomass (Biology Only)</i></li> <li><i>Food Production (Biology Only)</i></li> </ul> <b>Chemistry</b> <ul style="list-style-type: none"> <li>Rate of Reaction</li> <li>Calculating Rate of Reaction</li> <li>Increasing Rate of Reaction</li> </ul>



			<ul style="list-style-type: none"> <li>• <i>Titrations (Chemistry Only)</i></li> <li>• <i>Percentage Yield (Chemistry Only)</i></li> <li>• <i>Atom Economy (Chemistry Only)</i></li> <li>• <i>Volume of Gas (Chemistry Only)</i></li> </ul>			<ul style="list-style-type: none"> <li>• Reversible Reactions</li> <li>• Dynamic Equilibrium</li> </ul>
<b>Skills</b>	<p><b>Biology:</b> Microscopy: - Pupils will use a light microscope to observe, draw and label biological specimens. Osmosis: - Pupils will investigate the effect of a range of concentrations of salt or sugar solutions on the mass of plant tissue.</p> <p><b>Physics:</b> Thermal insulation (Physics Only) - Pupils will investigate the effectiveness of different materials as thermal insulators and the factors that may affect the thermal insulation properties of a material.</p>	<p><b>Biology:</b> Food Tests: - Pupils will use qualitative reagents to test for a range of carbohydrates, lipids and proteins. including: Benedict's test for sugars, iodine test for starch and Biuret reagent for protein. Enzymes: - Pupils will investigate the effect of pH on the rate of reaction of amylase enzyme.</p> <p><b>Physics:</b> Resistance - Pupils will use circuit diagrams to set up and check appropriate circuits to investigate the factors that affect the resistance of an electrical circuit. - Pupils will use circuit diagrams to construct appropriate circuits to investigate the I-V characteristics of a variety of circuit elements including a filament lamp, a resistor and a diode at constant temperature.</p>	<p><b>Biology:</b> Microbiology (Biology Only): - Pupils will investigate the effect of antiseptics or antibiotics on bacterial growth using agar plates and measuring zones of inhibition.</p>	<p><b>Biology:</b> Photosynthesis: - Pupils will investigate the effect of light intensity on the rate of photosynthesis using an aquatic organism such as pondweed.</p> <p><b>Chemistry:</b> Making Salts - Pupils will prepare a pure, dry sample of a soluble salt from an insoluble oxide or carbonate using a Bunsen burner to heat dilute acid and a water bath to evaporate the solution. <i>Neutralisation (Chemistry Only)</i> - Pupils will determine the reacting volumes of solutions of a strong acid and a strong alkali by titration.</p> <p><b>Physics:</b> Density - Pupils will use appropriate apparatus to make and record the measurements needed to determine the densities of regular and irregular solid objects and liquids. Specific Heat Capacity</p>	<p><b>Chemistry:</b> Electrolysis - Pupils will investigate what happens when aqueous solutions are electrolysed using inert electrodes. Temperature changes - Pupils will Investigate the variables that affect temperature change in chemical reactions</p>	<p><b>Biology:</b> Field Investigations: - Pupils will measure the population size of a common species in a habitat, using sampling techniques to investigate the effect of a factor on the distribution of this species. <i>Decay (Biology Only)</i> - Pupils will investigate the effect of temperature on the rate of decay of fresh milk by measuring pH change.</p> <p><b>Chemistry:</b> Rates of reaction - Pupils will investigate how changes in concentration affect the rates of reactions by both measuring the volume of a gas produced and monitoring a change in colour or turbidity.</p>



				- Pupils will determine the specific heat capacity of one or more materials.		
<b>Assessments</b>	<p><b>Biology:</b> Cells Biology Exam Style Questions Assessment</p> <p><b>Chemistry:</b> Atomic Structure &amp; the Periodic Table Exam Style Questions Assessment</p> <p><b>Physics:</b> Energy Exam Style Questions Assessment</p>	<p><b>Biology:</b> Organisation Exam Style Questions Assessment</p> <p><b>Chemistry:</b> Bonding, Structure &amp; the Properties of Matter Exam Style Questions Assessment</p>	<p><b>Biology:</b> Infection &amp; Response Exam Style Questions Assessment</p> <p><b>Chemistry:</b> Quantitative Chemistry Exam Style Questions Assessment</p> <p><b>Physics:</b> Electricity Exam Style Questions Assessment</p>	<p><b>Biology:</b> Bioenergetics Exam Style Questions Assessment</p> <p><b>Chemistry:</b> Chemical Changes Exam Style Questions Assessment</p> <p><b>Physics:</b> Particle Model of Matter Exam Style Questions Assessment</p>	<p><b>Chemistry:</b> Electrolysis &amp; Energy Changes Exam Style Questions Assessment</p> <p><b>Physics:</b> Atomic Structure Exam Style Questions Assessment</p> <p><b>End of Year Ten Exam:</b> Pupils will complete three exam papers, one in biology, one in chemistry and one in physics covering the GCSE paper one content.</p>	<p><b>Biology:</b> Ecology Exam Style Questions Assessment</p> <p><b>Chemistry:</b> The Rate &amp; Extent of Chemical Change Exam Style Questions Assessment</p>
<b>Homework</b>	<p>All pupils will be set a number of 20 question educake quizzes to complete online using the <a href="http://www.educake.co.uk">www.educake.co.uk</a> website related to the content they are studying.</p> <p>Pupils may be set independent practice questions to complete in their science booklets for these units. They can use the content and guided practice sections of the booklet to support them to complete the work.</p> <p>Pupils are also expected to regularly test themselves on the retrieval quizzes in their booklets, to support them to learn the key content of the units.</p>	<p>All pupils will be set a number of 20 question educake quizzes to complete online using the <a href="http://www.educake.co.uk">www.educake.co.uk</a> website related to the content they are studying.</p> <p>Pupils may be set independent practice questions to complete in their science booklets for these units. They can use the content and guided practice sections of the booklet to support them to complete the work.</p> <p>Pupils are also expected to regularly test themselves on the retrieval quizzes in their booklets, to support them to learn the key content of the units.</p>	<p>All pupils will be set a number of 20 question educake quizzes to complete online using the <a href="http://www.educake.co.uk">www.educake.co.uk</a> website related to the content they are studying.</p> <p>Pupils may be set independent practice questions to complete in their science booklets for these units. They can use the content and guided practice sections of the booklet to support them to complete the work.</p> <p>Pupils are also expected to regularly test themselves on the retrieval quizzes in their booklets, to support them to learn the key content of the units.</p>	<p>All pupils will be set a number of 20 question educake quizzes to complete online using the <a href="http://www.educake.co.uk">www.educake.co.uk</a> website related to the content they are studying.</p> <p>Pupils may be set independent practice questions to complete in their science booklets for these units. They can use the content and guided practice sections of the booklet to support them to complete the work.</p> <p>Pupils are also expected to regularly test themselves on the retrieval quizzes in their booklets, to support them to learn the key content of the units.</p>	<p>All pupils will be set a number of 20 question educake quizzes to complete online using the <a href="http://www.educake.co.uk">www.educake.co.uk</a> website related to the content they are studying.</p> <p>Pupils may be set independent practice questions to complete in their science booklets for these units. They can use the content and guided practice sections of the booklet to support them to complete the work.</p> <p>Pupils are also expected to regularly test themselves on the retrieval quizzes in their booklets, to support them to learn the key content of the units.</p>	<p>All pupils will be set a number of 20 question educake quizzes to complete online using the <a href="http://www.educake.co.uk">www.educake.co.uk</a> website related to the content they are studying.</p> <p>Pupils may be set independent practice questions to complete in their science booklets for these units. They can use the content and guided practice sections of the booklet to support them to complete the work.</p> <p>Pupils are also expected to regularly test themselves on the retrieval quizzes in their booklets, to support them to learn the key content of the units.</p>



	Revision for end of unit assessments.	Revision for end of unit assessments.	support them to learn the key content of the units.  Revision for end of unit assessments.	Revision for end of unit assessments and year ten exams.	Revision for end of unit assessments and year ten exams.	Revision for end of unit assessments.
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All pupils have their own username and password for the [www.educake.co.uk](http://www.educake.co.uk) website where they can complete the online quizzes set for homework. If pupils are struggling to access the website, they should speak to one of their science teachers. Pupils can also set themselves quizzes on specific topics on the educake website to support them with their revision.