




	Year:	10	Subject:	Combined Science	Spring 2	Summer 1	Summer 2		
Intent	Subject Concepts (Substantive knowledge)		• Biology	<p>(B10, B11) Homeostasis and response</p> <p><u>Practical opportunities</u> Investigate the effect of a factor on human reaction time</p>	<p>Prior Knowledge:</p> <ul style="list-style-type: none"> <li>Define a Healthy lifestyle</li> <li>Describe the role of the nervous system</li> <li>Identify Specialised cells</li> </ul>	<p>Ecology (B15, B16, B17)</p> <p><u>Practical opportunities</u> Measure the population size of a common species in a habitat</p> <p>Investigate competition in plants</p>	<p>Prior Knowledge:</p> <ul style="list-style-type: none"> <li>Write the word equation for photosynthesis</li> <li>Describe the role of photosynthesis</li> <li>Draw food chains and food webs and explain factors affecting removal of organisms</li> <li>Describe some adaptations in plants and animals</li> </ul>	<p>Ecology (B15, B16, B17)</p> <p><u>Practical opportunities</u> Measure the population size of a common species in a habitat</p>	<p>Prior Knowledge:</p> <ul style="list-style-type: none"> <li>Write the word equation for photosynthesis <ul style="list-style-type: none"> <li>Describe the role of photosynthesis</li> <li>Draw food chains and food webs and explain factors affecting removal of organisms</li> <li>Describe some adaptations in plants and animals</li> </ul> </li> </ul>
					<p>Takeaway Learning:</p> <ul style="list-style-type: none"> <li>Explain the role of the endocrine system</li> <li>Compare the nervous and hormonal responses and systems</li> <li>Explain how the body controls blood glucose level</li> <li>Describe the role of hormones in reproduction and contraception</li> </ul>		<p>Takeaway Learning:</p> <ul style="list-style-type: none"> <li>Explain adaptation and competition in plants and animals</li> <li>Explain biodiversity</li> <li>Undertake different sampling methods</li> <li>Recognise that carbon atoms are moved around the Earth (recycled).</li> <li>Describe the carbon and water cycle</li> <li>Identify ecological relationships</li> </ul>		<p>Takeaway Learning:</p> <ul style="list-style-type: none"> <li>Explain adaptation and competition in plants and animals</li> <li>Explain biodiversity</li> <li>Undertake different sampling methods</li> <li>Recognise that carbon atoms are moved around the Earth (recycled).</li> <li>Describe the carbon and water cycle</li> <li>Identify ecological relationships</li> </ul>
			• Chemistry	<p>(C7) Energy Changes</p> <p><u>Practical opportunities</u> Investigating temperature change</p>	<p>Prior Knowledge:</p> <ul style="list-style-type: none"> <li>State how to identify a chemical reaction</li> <li>Describe the Properties of metals</li> <li>Describe how to use the pH scale</li> </ul>	<p>(C6) Electrolysis</p> <p><u>Practical opportunities</u> Investigate the electrolysis of a solution</p> <p>Move onto Rates and equilibrium (C8)</p>	<p>Prior Knowledge:</p> <ul style="list-style-type: none"> <li>Describe neutralisation</li> <li>Explain how to make salts</li> <li>State the reactions of acids with metals</li> </ul>	<p>(C8) Rates and equilibrium</p> <p><u>Practical opportunities</u> Investigating the effect of concentration on rate of reaction</p>	<p>Prior Knowledge:</p> <ul style="list-style-type: none"> <li>Explain the differences between heat and temperature for the collision theory</li> <li>Describe how you know a chemical reaction is taking place</li> <li>Write word and symbol equations</li> </ul>
		<p>Takeaway Learning:</p> <ul style="list-style-type: none"> <li>Identifying endo and exothermic reactions</li> <li>Calculate bond energy</li> <li>Describe reaction profiles</li> <li>Use energy transfer diagrams appropriately</li> </ul>		<p>Takeaway Learning:</p> <ul style="list-style-type: none"> <li>Explain electrolysis</li> <li>Describe the differences between dissolved and molten, electrolysis of binary compounds</li> <li>Identify substances formed at the cathode and anode in a reaction</li> </ul>		<p>Takeaway Learning:</p> <ul style="list-style-type: none"> <li>Explain the collision theory</li> <li>Describe what activation energy is</li> <li>Explain the factors affecting the rate of a chemical reaction</li> <li>Define equilibrium and reversible reactions.</li> <li>Practical application of rate of reaction industry</li> </ul>			
	• Physics	<p>Atomic structure (P7)</p> <p>Radioactivity</p>	<p>Prior Knowledge:</p> <ul style="list-style-type: none"> <li>Name the three sub-atomic particles found in an atom (proton, neutron, and electron).</li> <li>Identify the mass and atomic number</li> <li>Describe how isotopes are atoms of the same</li> </ul>	<p>Waves and electromagnetism (P11, P12, P13)</p> <p><u>Practical opportunities</u> Investigating plane waves in a triple tank and waves in a solid</p>	<p>Prior Knowledge:</p> <ul style="list-style-type: none"> <li>Describe the different types of waves, transverse and longitudinal waves</li> <li>Complete calculations using the wave equation</li> </ul>	<p>Waves and electromagnetism (P11, P12, P13)</p> <p><u>Practical opportunities</u></p>	<p>Prior Knowledge:</p> <ul style="list-style-type: none"> <li>Describe the different types of waves, transverse and longitudinal waves</li> <li>Complete calculations using the wave equation</li> </ul>		

			<ul style="list-style-type: none"> <li>• element with different mass numbers.</li> </ul>	<ul style="list-style-type: none"> <li>• Takeaway Learning: <ul style="list-style-type: none"> <li>• Identify the Rutherford (nuclear) model of an atom.</li> <li>• Identify the type of decay taking place from a nuclear equation.</li> <li>• Rank the three types of nuclear radiation in order of their penetrating power.</li> </ul> </li> </ul>	<p>Investigating infrared radiation</p>	<ul style="list-style-type: none"> <li>• Takeaway Learning: <ul style="list-style-type: none"> <li>• Describe the properties of EM waves</li> <li>• Display a graph to nuclear decay</li> <li>• Explain the uses of waves in communication.</li> </ul> </li> </ul>	<p>Investigating plane waves in a triple tank and waves in a solid</p> <p>Investigating infrared radiation</p>	<ul style="list-style-type: none"> <li>• Takeaway Learning: <ul style="list-style-type: none"> <li>• Describe the properties of EM waves</li> <li>• Display a graph to nuclear decay</li> <li>• Explain the uses of waves in communication.</li> </ul> </li> </ul>
<p><b>Disciplinary Knowledge</b></p>			<ul style="list-style-type: none"> <li>• Understand how scientific methods and theories develop over time</li> <li>• Appreciate the power and limitations of science and consider any ethical issues which may arise.</li> <li>• Explain everyday and technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments.</li> <li>• Use a variety of models such as representational, spatial, descriptive, computational and mathematical to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts.</li> <li>• Understand how scientific methods and theories develop over time.</li> <li>• Use a variety of models such as representational, spatial, descriptive, computational and mathematical to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts.</li> <li>• Explain everyday and technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments.</li> <li>• Evaluate risks both in practical science and the wider societal context, including perception of risk in relation to data and consequences.</li> <li>• Recognise the importance of peer review of results and of communicating results to a range of audiences.</li> </ul>	<ul style="list-style-type: none"> <li>• Use a variety of models such as representational, spatial, descriptive, computational and mathematical to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts.</li> <li>• 1.4 Explain everyday and technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments.</li> <li>• Evaluate risks both in practical science and the wider societal context, including perception of risk in relation to data and consequences.</li> <li>• Recognise the importance of peer review of results and of communicating results to a range of audiences.</li> <li>• Use a variety of models such as representational, spatial, descriptive, computational and mathematical to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts.</li> <li>• Use a variety of models such as representational, spatial, descriptive, computational and mathematical to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts.</li> <li>• Explain everyday and technological applications of science; evaluate associated personal, social, economic and environmental implications; and make decisions based on the evaluation of evidence and arguments.</li> <li>• Evaluate risks both in practical science and the wider societal context, including perception of risk in relation to data and consequences.</li> <li>• Plan experiments or devise procedures to make observations, produce or characterise a substance, test hypotheses, check data or explore phenomena.</li> <li>• Apply a knowledge of a range of techniques, instruments, apparatus, and materials to select those appropriate to the experiment.</li> <li>• Carry out experiments appropriately having due regard for the correct manipulation of apparatus, the accuracy of measurements and health and safety considerations</li> <li>• Make and record observations and measurements using a range of apparatus and methods.</li> <li>• Evaluate methods and suggest possible improvements and further investigations</li> <li>• Presenting observations and other data using appropriate methods.</li> <li>• Interpreting observations and other data (presented in verbal, diagrammatic, graphical, symbolic or numerical form), including identifying patterns and trends, making inferences and drawing conclusions.</li> </ul>	<ul style="list-style-type: none"> <li>• Use a variety of models such as representational, spatial, descriptive, computational and mathematical to solve problems, make predictions and to develop scientific explanations and understanding of familiar and unfamiliar facts.</li> <li>• 1.4 Explain everyday and technological applications of science; 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Implementation	<b>Common Misconceptions</b>		<ul style="list-style-type: none"> <li><a href="#">biology misconceptions</a></li> </ul>	<ul style="list-style-type: none"> <li>Plants are dependent on humans (e.g. watering, planting seeds)</li> <li>Plants cannot defend themselves against herbivores</li> <li>Food webs are interpreted as simple food chains, rather than a flow of energy</li> <li>Organisms higher in a food web, eat anything or everything that is lower in the food web.</li> <li>There are more herbivores than carnivores because people keep and breed herbivores</li> <li>Decomposers release some energy that is cycled back to plants</li> <li>Carnivores have more energy or power than herbivores do.</li> <li>Carnivores are big or ferocious, or both. Herbivores are small and passive.</li> </ul>	<ul style="list-style-type: none"> <li>Plants are dependent on humans (e.g. watering, planting seeds)</li> <li>Plants cannot defend themselves against herbivores</li> <li>Food webs are interpreted as simple food chains, rather than a flow of energy</li> <li>Organisms higher in a food web, eat anything or everything that is lower in the food web.</li> <li>There are more herbivores than carnivores because people keep and breed herbivores</li> <li>Decomposers release some energy that is cycled back to plants</li> <li>Carnivores have more energy or power than herbivores do.</li> <li>Carnivores are big or ferocious, or both. Herbivores are small and passive.</li> </ul>
	<b>Enabling or Adapting the Curriculum</b>	<b>SEND Students</b>	<ul style="list-style-type: none"> <li>Vocabulary sheets</li> <li>Scaffolding – writing frames/use of booklets</li> <li>Teach keyword vocabulary and break down ie photo – light, lysis to split <ul style="list-style-type: none"> <li>Breaking text into chunks on powerpoints</li> <li>Dual coding - visual clues</li> <li>Scaffolding for long text, graphing</li> <li>Use coloured slides</li> <li>Modelling</li> <li>Subtitles on any videos</li> </ul> </li> <li>Provide writing frames and support for answer 6 mark questions</li> </ul>	<ul style="list-style-type: none"> <li>Vocabulary sheets</li> <li>Scaffolding – writing frames/use of booklets</li> <li>Teach keyword vocabulary and break down ie photo – light, lysis to split <ul style="list-style-type: none"> <li>Breaking text into chunks on powerpoints</li> <li>Dual coding - visual clues</li> <li>Scaffolding for long text, graphing</li> <li>Use coloured slides</li> <li>Modelling</li> <li>Subtitles on any videos</li> </ul> </li> <li>Provide writing frames and support for answer 6 mark questions</li> </ul>	<ul style="list-style-type: none"> <li>Vocabulary sheets</li> <li>Scaffolding – writing frames/use of booklets</li> <li>Teach keyword vocabulary and break down ie photo – light, lysis to split <ul style="list-style-type: none"> <li>Breaking text into chunks on powerpoints</li> <li>Dual coding - visual clues</li> <li>Scaffolding for long text, graphing</li> <li>Use coloured slides</li> <li>Modelling</li> <li>Subtitles on any videos</li> </ul> </li> <li>Provide writing frames and support for answer 6 mark questions</li> </ul>
		<b>Disadvantaged Students</b>	<ul style="list-style-type: none"> <li>Bring career links into lessons (aspirational)</li> <li>External trips – linked with STEM co-ordinator?</li> <li>Access to revision guides</li> <li>Support with exam questions through use of displays and key terminology</li> <li>Support long answer questions with sentence starters</li> <li>Use of CGP books to support in PLC lessons</li> </ul>	<ul style="list-style-type: none"> <li>Bring career links into lessons (aspirational)</li> <li>External trips – linked with STEM co-ordinator?</li> <li>Access to revision guides</li> <li>Support with exam questions through use of displays and key terminology</li> <li>Support long answer questions with sentence starters</li> <li>Use of CGP books to support in PLC lessons</li> </ul>	<ul style="list-style-type: none"> <li>Bring career links into lessons (aspirational)</li> <li>External trips – linked with STEM co-ordinator?</li> <li>Access to revision guides</li> <li>Support with exam questions through use of displays and key terminology</li> <li>Support long answer questions with sentence starters</li> <li>Use of CGP books to support in PLC lessons</li> </ul>
		<b>More Able Students</b>	<ul style="list-style-type: none"> <li><a href="#">Debate on issues relating to fertility and ethics</a></li> <li>Build into lessons well-designed extension tasks</li> <li>promote higher-order skills such as speculation, inference, prediction, hypothesis and synthesis, as well as nurturing independence and self-knowledge.</li> <li>Asking probing questions</li> <li>Encourage effective discussion between teacher and pupil</li> <li>open-ended tasks that do not have one right answer</li> <li>Set an independent task, such as a further investigation</li> <li>invite students to decide how they would like to demonstrate their learning to you or the rest of the class after an agreed length of time.</li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Investigate extremophiles</a></li> <li>Build into lessons well-designed extension tasks</li> <li>promote higher-order skills such as speculation, inference, prediction, hypothesis and synthesis, as well as nurturing independence and self-knowledge.</li> <li>Asking probing questions</li> <li>Encourage effective discussion between teacher and pupil</li> <li>open-ended tasks that do not have one right answer</li> <li>Set an independent task, such as a further investigation</li> <li>invite students to decide how they would like to demonstrate their learning to you or the rest of the class after an agreed length of time.</li> </ul>	<ul style="list-style-type: none"> <li>Build into lessons well-designed extension tasks</li> <li>promote higher-order skills such as speculation, inference, prediction, hypothesis and synthesis, as well as nurturing independence and self-knowledge.</li> <li>Asking probing questions</li> <li>Encourage effective discussion between teacher and pupil</li> <li>open-ended tasks that do not have one right answer</li> <li>Set an independent task, such as a further investigation</li> <li>invite students to decide how they would like to demonstrate their learning to you or the rest of the class after an agreed length of time.</li> </ul>
	<b>Literacy/Numeracy Skills</b> 	<b>LITERACY</b>	<ul style="list-style-type: none"> <li><a href="#">Biology keywords</a></li> <li><a href="#">Chemistry keywords</a></li> <li><a href="#">Physics keywords</a></li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Biology keywords</a></li> <li><a href="#">Chemistry keywords</a></li> <li><a href="#">Physics keywords</a></li> </ul>	<ul style="list-style-type: none"> <li><a href="#">Biology keywords</a></li> <li><a href="#">Chemistry keywords</a></li> <li><a href="#">Physics keywords</a></li> </ul>
		<b>Reading:</b>	<ul style="list-style-type: none"> <li><a href="#">Diabetes and stem cell treatment article</a></li> <li>Class textbooks</li> <li>BBC bitesize</li> <li>Revision guides</li> </ul>	<ul style="list-style-type: none"> <li>Class textbooks</li> <li>BBC bitesize</li> <li>Revision guides</li> </ul>	<ul style="list-style-type: none"> <li>Class textbooks</li> <li>BBC bitesize</li> <li>Revision guides</li> </ul>
		<b>Writing:</b>	<ul style="list-style-type: none"> <li>Definition quizzes – all three key areas</li> <li>6 mark questions</li> <li>End of topic tests</li> </ul>	<ul style="list-style-type: none"> <li>Definition quizzes – all three key areas</li> <li>6 mark questions</li> <li>End of topic tests</li> </ul>	<ul style="list-style-type: none"> <li>Definition quizzes – all three key areas</li> <li>6 mark questions</li> <li>End of topic tests</li> </ul>
		<b>Oracy:</b>	<ul style="list-style-type: none"> <li><a href="#">Class discussion/debate on advantages and disadvantages of IVF</a></li> <li>Cold calling, answering questions in class</li> <li>Class discussion on topic areas being addressed</li> </ul>	<ul style="list-style-type: none"> <li>Cold calling, answering questions in class</li> <li>Class discussion on topic areas being addressed</li> <li>Reading out loud</li> <li>Answering questions</li> </ul>	<ul style="list-style-type: none"> <li>Cold calling, answering questions in class</li> <li>Class discussion on topic areas being addressed</li> <li>Reading out loud</li> <li>Answering questions</li> </ul>

			<ul style="list-style-type: none"> <li>• Reading out loud</li> <li>• Answering questions</li> <li>• Feedback through discussion and debates</li> </ul>	<ul style="list-style-type: none"> <li>• Feedback through discussion and debates</li> </ul>	<ul style="list-style-type: none"> <li>• Feedback through discussion and debates</li> </ul>
		<b>NUMERACY</b>	<ul style="list-style-type: none"> <li>• Analysis of data</li> <li>• Bond energy calculations</li> <li>• Symbol and word equations</li> <li>• Identify mass and atomic number</li> <li>• Half life calculations</li> <li>• Data analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Mean, mode, median – quadrats</li> <li>• Analysis of data</li> <li>• Drawing graphs</li> <li>• Symbol and word equations</li> <li>• Writing half equations</li> <li>• Calculate frequency and rearrange the equation</li> <li>• Recording data</li> </ul>	<ul style="list-style-type: none"> <li>• Mean, mode, median – quadrats</li> <li>• Analysis of data</li> <li>• Drawing graphs</li> <li>• Calculating rates</li> <li>• Analysis of data</li> <li>• Graph drawing</li> <li>• Use of standard form</li> <li>• Word and symbol equations</li> <li>• Calculating tangents on graphs</li> <li>• Calculate frequency and rearrange the equation</li> <li>• Recording data</li> </ul>
	<b>Digital Strategy</b>		<ul style="list-style-type: none"> <li>• Use of animations</li> <li>• Interactive whiteboards for ipads - <a href="https://whiteboard.fi/">https://whiteboard.fi/</a></li> <li>• Use of ipads to complete forms quiz to support PLC and teacher assessment</li> <li>• Interactive physics simulation and questions - <a href="#">phycis concept builder</a></li> <li>• <u>phet simulations - all three sciences</u></li> </ul>	<ul style="list-style-type: none"> <li>• Use of animations</li> <li>• Interactive whiteboards for ipads - <a href="https://whiteboard.fi/">https://whiteboard.fi/</a></li> <li>• Use of ipads to complete forms quiz to support PLC and teacher assessment</li> <li>• Interactive physics simulation and questions - <a href="#">phycis concept builder</a></li> <li>• <u>phet simulations - all three sciences</u></li> </ul>	<ul style="list-style-type: none"> <li>• Interactive whiteboards for ipads - <a href="https://whiteboard.fi/">https://whiteboard.fi/</a></li> <li>• Use of ipads to complete forms quiz to support PLC and teacher assessment</li> <li>• Interactive physics simulation and questions - <a href="#">phycis concept builder</a></li> <li>• <u>phet simulations - all three sciences</u></li> </ul>
<b>Home Learning</b>					
<b>Impact</b>	<b>Composite Assessment</b>		Date: <input type="text"/> Content: <input type="text"/>	Date: <input type="text"/> Content: <input type="text"/>	Date: <input type="text"/> Content: <input type="text"/>