

**SCIENCE – YEAR 9 CURRICULUM OVERVIEW 2020 / 2021**

TOPIC TITLE	TOPIC OVERVIEW	KNOWLEDGE & SKILLS	ASSESSMENT	WIDER LINKS
<p><b>Year 9 - Term 1</b></p> <p><b>B1 Cells Structure and Transport</b></p>	<p><b>Cells and Microscopes</b></p> <ul style="list-style-type: none"> <li>• How are prokaryotic and eukaryotic cells different?</li> <li>• How can we calculate the size of a cell using a microscope?</li> <li>• How do substances enter and leave cells?</li> </ul>	<p><b>Cells and Microscopes</b></p> <ul style="list-style-type: none"> <li>• Review the sub-cellular structures in animal and plant cells.</li> <li>• Use microscope to observe and draw cells.</li> <li>• Apply the formula to calculate magnification.</li> <li>• Explain what happens to cell differentiation.</li> <li>• Describe and explain diffusion, osmosis and active transport.</li> </ul> <p><b>Key Skills</b></p> <ul style="list-style-type: none"> <li>• Using microscopes.</li> </ul>	<p><b>Cells and Microscopes</b></p> <p>Weekly homework which includes research and exam style questions</p> <p>Students will complete an end of topic test each half term. These tests contain a mixture of recall and application questions based on the current topic.</p>	<p><b>Cells and Microscopes</b></p> <p><u>Literacy:</u> Writing methods.</p> <p><u>Numeracy:</u> Measurement of cells</p> <p><u>Key links to other units:</u></p> <p>Year 7 – Cells Year 8 – Healthy Living Year 10 – Cells and microscopes Year 10 – Cell division</p>
<p><b>B2 Cell Division</b></p>	<p><b>Cell Division</b></p> <ul style="list-style-type: none"> <li>• What happens at different stages in the cell cycle?</li> <li>• How can stem cells be useful?</li> </ul>	<p><b>Cell Division</b></p> <ul style="list-style-type: none"> <li>• Describe mitosis.</li> <li>• Explain how stem cells can be used.</li> <li>• Discuss the controversy surrounding the use of stem cells in medicine.</li> </ul>	<p><b>Cell Division</b></p> <p>Weekly homework which includes research and exam style questions</p> <p>Students will complete an end of topic test each half term. These tests contain a mixture of recall and application questions based on the current topic.</p>	<p><b>Cell Division</b></p> <p><u>Literacy:</u> Method writing.</p> <p><u>Key links to other units:</u></p> <p>Year 7 – Cells Year 8 – Healthy Living Year 9 – Cells and microscopes Year 9 – Cell division Year 11 - Genetics</p>
<p><b>B3 Organisation of the digestive system</b></p>	<p><b>Organisation and Digestion</b></p> <p>In the second short biology topic this module,</p>	<p><b>Organisation and Digestion</b></p> <ul style="list-style-type: none"> <li>• Review the organs of the digestive system.</li> <li>• Explain how enzymes work.</li> </ul>	<p><b>Organisation and Digestion</b></p> <p>Weekly homework which includes research and exam style questions</p>	<p><b>Organisation and Digestion</b></p> <p>Year 8 – Human organ systems.</p>

	<p>we will explore:</p> <ul style="list-style-type: none"> <li>• How does our digestive system work?</li> <li>• How can we show the nutrients in different foods?</li> <li>• What are the optimum conditions for different enzymes?</li> </ul>	<ul style="list-style-type: none"> <li>• Carry out food tests to investigate different foods.</li> <li>• Carry out an investigation into the rate of an enzyme controlled reaction.</li> </ul>	<p>Students will complete an end of topic test each half term. These tests contain a mixture of recall and application questions based on the current topic.</p>	
<b>C1 Atomic Structure</b>	<p><b>Atomic Structure</b></p> <ul style="list-style-type: none"> <li>• What are atoms made from?</li> <li>• How do we balance equations?</li> <li>• What is the history of the atom?</li> <li>• What is an ion?</li> <li>• What is an isotope?</li> </ul>	<p><b>Atomic Structure</b></p> <ul style="list-style-type: none"> <li>• Describing the structure of an atom</li> <li>• Explaining the development of our ideas about atoms.</li> <li>• Explaining the conservation of mass.</li> <li>• Explaining what occurs when electrons are lost or gained from atoms.</li> <li>• Explain how atoms of the same proton number can have varying numbers of neutrons.</li> </ul>	<p><b>Atomic Structure</b></p> <p>Weekly homework which includes research and exam style questions</p> <p>Students will complete an end of topic test each half term. These tests contain a mixture of recall and application questions based on the current topic.</p>	<p><b>Atomic Structure</b></p> <p>Year 7 – Separating mixtures Year 8 – Periodic table Year 9 – Chemistry Fundamentals Year 10 – Structure and bonding</p>
<b>C2 The Periodic Table</b>	<p><b>The Periodic Table</b></p> <ul style="list-style-type: none"> <li>• How are the elements arranged in the periodic table?</li> <li>• Why are there trends in reactivity in groups 1 and 7?</li> <li>• What are the properties of the Noble Gases?</li> <li>• How was the periodic table developed?</li> </ul>	<p><b>The Periodic Table</b></p> <ul style="list-style-type: none"> <li>• Revise the properties of metals and non-metals</li> <li>• Explore the alkali metals, halogens and noble gases.</li> <li>• Relate the reactivity of these elements to their electronic structure.</li> <li>• Describe how the periodic table was developed.</li> </ul> <p><b>Key Skills</b></p> <ul style="list-style-type: none"> <li>• Applying equations in physics.</li> <li>• Interpreting experiment results.</li> <li>• Evaluation.</li> </ul>	<p><b>The Periodic Table</b></p> <p>Weekly homework which includes research and exam style questions</p> <p>Students will complete an end of topic test each half term. These tests contain a mixture of recall and application questions based on the current topic.</p>	<p><b>The Periodic Table</b></p> <p>Year 7 - Particles Year 8 - The Periodic Table Year 9 - Periodic Table Year 10 - Extracting metals</p>

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<p><b>Year 9 - Term 2</b></p> <p><b>B4 Organising Animals and Plants</b></p>	<p><b>Organising Animals and Plants</b></p> <ul style="list-style-type: none"> <li>• What is the structure of plants?</li> <li>• What are the factors that affect photosynthesis?</li> <li>• How does the circulatory system work?</li> <li>• How does the respiratory system work?</li> <li>• How does the body respond to exercise?</li> </ul>	<p><b>Organising Animals and Plants</b></p> <ul style="list-style-type: none"> <li>• Know the structure of a leaf.</li> <li>• Investigate photosynthesis.</li> <li>• Describe what plants do with glucose.</li> <li>• Explain transpiration.</li> <li>• Describe the structure of the heart.</li> <li>• Describe the components of the blood. Review the structure of the lungs.</li> <li>• Explain aerobic and anaerobic respiration.</li> <li>• Describe metabolism.</li> </ul>	<p><b>Organising Animals and Plants</b></p> <p>Weekly homework which includes research and exam style questions</p> <p>Students will complete an end of topic test each half term. These tests contain a mixture of recall and application questions based on the current topic.</p>	<p><b>Organising Animals and Plants</b></p> <p><u>Literacy:</u> Answering longer describe questions.</p> <p><u>Numeracy:</u> Substitution into equations. Drawing results tables</p> <p><u>Key links to other units:</u> Year 7 – Variety of Life Year 9 – Organisation of animals and plants Year 10 - Ecology</p>
<p><b>P5 Electricity in The Home</b></p>	<p><b>Electricity in The Home</b></p> <ul style="list-style-type: none"> <li>• How do we generate electricity?</li> <li>• How is electricity transferred to our homes?</li> <li>• How do you calculate electrical power?</li> </ul>	<p><b>Electricity in The Home</b></p> <ul style="list-style-type: none"> <li>• Describe how to wire a plug</li> <li>• Apply equations to calculate electrical power.</li> <li>• Explain the efficiency of the national grid?</li> </ul>	<p><b>Electricity in The Home</b></p> <p>Weekly homework which includes research and exam style questions</p> <p>Students will complete an end of topic test each half term. These tests contain a mixture of recall and application questions based on the current topic.</p>	<p><b>Electricity in The Home</b></p> <p>Year 8 – Electricity and Magnetism Year 9 – Energy Transfers Year 10 – electrical circuits</p>
<p><b>P8 Forces in Balance</b></p>	<p><b>Forces in Balance</b></p> <p>In this second physics topic, students will explore:</p>	<p><b>Forces in Balance</b></p> <ul style="list-style-type: none"> <li>• Revise different forces.</li> <li>• Revise representing forces.</li> </ul>	<p><b>Forces in Balance</b></p> <p>Weekly homework which includes research and exam style questions</p>	<p><b>Forces in Balance</b></p> <p>Year 7 – Forces Year 8 - Motion Year 9 – Forces in Balance</p>

	<ul style="list-style-type: none"> <li>• How do you calculate resultant forces?</li> <li>• How does gravity affect weight?</li> <li>• How do springs store energy?</li> </ul>	<ul style="list-style-type: none"> <li>• Calculate resultant forces.</li> <li>• Explain how forces relate to energy transfer.</li> <li>• Apply the equation to calculate weight?</li> <li>• Investigate the extension of a spring.</li> </ul> <p><b>Key Skills</b></p> <ul style="list-style-type: none"> <li>• Applying equations.</li> </ul>	<p>Students will complete an end of topic test each half term. These tests contain a mixture of recall and application questions based on the current topic</p>	<p>Year 10 – Energy Extras Year 11 – Forces in Motion</p>
<b>C5 Chemical Changes</b>	<p><b>Chemical Changes</b></p> <ul style="list-style-type: none"> <li>• What is the reactivity series and how can you interpret it.</li> <li>• Explain the position and role of carbon in the reactivity series.</li> <li>• How are different metals extracted from their ores?</li> <li>• How to make salts.</li> <li>• What are acids and alkalis.</li> </ul>	<p><b>Chemical Changes</b> Investigate the temperature changes in reactions.</p> <ul style="list-style-type: none"> <li>• Review the reactivity of the group 1 metals.</li> <li>• Recall the reactivity series.</li> <li>• Describe displacement, oxidation and reduction reactions.</li> <li>• Explain how metals can be extracted by reduction.</li> <li>• Explain how to make salts from the reaction of acids and metals.</li> <li>• Explain a neutralisation reaction.</li> <li>• Describe how to identify the pH of a solution.</li> </ul>	<p><b>Chemical Changes</b> Weekly homework which includes research and exam style questions</p> <p>Students will complete an end of topic test each half term. These tests contain a mixture of recall and application questions based on the current topic.</p>	<p><b>Chemical Changes</b> Year 7 – Acids and Alkalis Year 8 – Chemical Reactions Year 9 – Separating Mixtures Year 10 – Salts</p>

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<p><b>Year 9 – Term 3</b></p> <p><b>B16 Adaptation &amp; Interdependence</b></p>	<p><b>Adaptation &amp; Interdependence</b></p> <ul style="list-style-type: none"> <li>• How are living things dependent on each other?</li> <li>• How are ecosystems organised?</li> <li>• How do we measure distribution and abundance in an ecosystem?</li> </ul>	<p><b>Adaptation &amp; Interdependence</b></p> <ul style="list-style-type: none"> <li>• Explain what interdependence is and how it can impact an ecosystem.</li> <li>• Define and give examples of biotic and abiotic factors.</li> <li>• Describe how to carry out a quadrat survey and a line transect.</li> <li>• Explain how organisms are adapted to survive?</li> </ul>	<p><b>Adaptation &amp; Interdependence</b> Weekly homework which includes research and exam style questions</p> <p>Students will complete an end of topic test each half term. These tests contain a mixture of recall and application questions based on the current topic.</p>	<p><b>Adaptation &amp; Interdependence</b> <u>Literacy:</u> Answering longer describe questions.</p> <p><u>Numeracy:</u> Substitution into equations. Drawing results tables.</p> <p><u>Key links to other units:</u> Year 7 – Variety of Life Year 9 – Organisation of animals and plants</p>
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	<ul style="list-style-type: none"> <li>• What do animals and plants compete for?</li> <li>• What is an adaptation?</li> </ul>			Year 11 – Ecology.
<b>B17 Organising an Ecosystem</b>	<b>Organising an Ecosystem</b> <ul style="list-style-type: none"> <li>• How is energy transferred in an ecosystem?</li> <li>• How is water cycled through habitats?</li> <li>• How is carbon transferred through ecosystems?</li> <li>• What is decomposition?</li> </ul>	<b>Organising an Ecosystem</b> <ul style="list-style-type: none"> <li>• Explain the relationships shown in food webs.</li> <li>• Define key terms such as: producer, consumer, herbivore, carnivore, omnivore and decomposer</li> <li>• Describe how nutrients are recycled in ecosystems.</li> </ul>	<b>Organising an Ecosystem</b> Weekly homework which includes research and exam style questions  Students will complete an end of topic test each half term. These tests contain a mixture of recall and application questions based on the current topic.	<b>Organising an Ecosystem</b> <u>Literacy:</u> Answering longer describe questions.  <u>Numeracy:</u> Drawing results tables  <u>Key links to other units:</u> Year 7 – Variety of Life Year 9 – Organisation of animals and plants Year 11 - Ecology
<b>B18 Biodiversity &amp; Ecosystems</b>	<b>Biodiversity &amp; Ecosystems</b> <ul style="list-style-type: none"> <li>• What is biodiversity and why is it important?</li> <li>• How has the human population explosion impacted biodiversity?</li> <li>• What are the types of pollution?</li> <li>• What is global warming?</li> </ul>	<b>Biodiversity &amp; Ecosystems</b> <ul style="list-style-type: none"> <li>• Identify what biodiversity is.</li> <li>• Describe the impact of human population on biodiversity.</li> <li>• Explain the impacts of land, water and air pollution.</li> <li>• Explain the key contributing factors to climate change.</li> <li>• Explain trophic levels and biomass within ecosystems.</li> <li>• Explain what can be done to protect biodiversity.</li> </ul>	<b>Biodiversity &amp; Ecosystems</b> Weekly homework which includes research and exam style questions  Students will complete an end of topic test each half term. These tests contain a mixture of recall and application questions based on the current topic.	<b>Biodiversity &amp; Ecosystems</b>  <u>Literacy:</u> Answering longer describe questions.  <u>Numeracy:</u> Drawing results tables. Interpretation of graph data  <u>Key links to other units:</u> Year 7 – Variety of Life Year 9 – Organisation of animals and plants Year 11 – Ecology.
<b>P3 Energy Resources</b>	<b>Energy Resources</b> <ul style="list-style-type: none"> <li>• What is a renewable and non-renewable energy resource?</li> </ul>	<b>Energy Resources</b> <ul style="list-style-type: none"> <li>• Explain sustainable development.</li> <li>• Compare different energy resources used to generate electricity.</li> </ul>	<b>Energy Resources</b> Weekly homework which includes research and exam style questions	<b>Energy Resources</b> <u>Literacy:</u> Answering longer describe questions.  <u>Numeracy:</u> Substitution into equations.

	<ul style="list-style-type: none"> <li>• How can we use Earth's resources sustainably?</li> <li>• How is the increased use of fossil fuels contributing to global climate change?</li> </ul>	<ul style="list-style-type: none"> <li>• Explain the social, economic and political influences in the UK energy mix.</li> </ul> <p><b>Key Skills</b></p> <ul style="list-style-type: none"> <li>• Variables in investigations.</li> </ul>	<p>Students will complete an end of topic test each half term. These tests contain a mixture of recall and application questions based on the current topic.</p>	<p>Drawing results tables.</p> <p><u>Key links to other units:</u>  Year 8: Energy  Year 8: Sound  Year 8: Light  Year 8: Earth  Year 10: Earth's atmosphere</p>
<b>P12 Electromagnet Waves</b>	<p><b>Electromagnetic Waves</b></p> <ul style="list-style-type: none"> <li>• What are the uses of the parts of the electromagnetic spectrum?</li> </ul>	<p><b>Electromagnetic Waves</b></p> <ul style="list-style-type: none"> <li>• Describe the electromagnetic spectrum and its uses?</li> </ul>	<p><b>Electromagnetic Waves</b></p> <p>Weekly homework which includes research and exam style questions</p> <p>Students will complete an end of topic test each half term. These tests contain a mixture of recall and application questions based on the current topic.</p>	<p><b>Electromagnetic Waves</b></p> <p>Year 7 – Sound  Year 8 – Light</p>
<b>C8 Rates of Reaction</b>	<p><b>Rates of Reaction</b></p> <ul style="list-style-type: none"> <li>• What are chemical reactions and how can they be useful?</li> </ul>	<p><b>Rates of Reaction</b></p> <ul style="list-style-type: none"> <li>• Describe what is meant by a chemical reaction.</li> <li>• How reaction rates affected by changing conditions.</li> <li>• Describe the role of catalysts in reaction rates.</li> </ul>	<p><b>Rates of Reaction</b></p> <p>Weekly homework which includes research and exam style questions</p> <p>Students will complete an end of topic test each half term. These tests contain a mixture of recall and application questions based on the current topic</p>	<p><b>Rates of Reaction</b></p> <p>Year 8 – Chemical Reactions  Year 9 – Structure and Bonding  Year 10 – Energy Changes</p> <p>Literacy:  Writing methods</p> <p>Numeracy:  Using equations.</p>

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