

## SCIENCE – Long term Plan 2024/2025

AO1 – **Demonstrate**: Knowledge and understanding of scientific ideas, scientific techniques and procedures.

AO2 – **Apply/explain**: Knowledge and understanding of scientific ideas, scientific enquiry, techniques and procedures.

AO3 – **Analyse/evaluate**: information and ideas to interpret and evaluate, make judgements and draw conclusions, develop and improve experimental procedures.

### **Working scientifically**

Through the content across all three disciplines, pupils should be taught to:

- Apply Scientific attitudes and pay attention to objectivity and show an aptitude for accuracy, precision, repeatability and reproducibility in accordance with the National Curriculum guidelines
- They should understand that scientific methods and theories develop as earlier explanations are modified to take account of new evidence and ideas, together with the importance of publishing results and peer review.
- Evaluate risks. Learn experimental skills and how to investigate issues.
- Regularly ask questions and develop a line of enquiry based on their observations of the real world, alongside prior knowledge and experience.
- Make predictions using scientific knowledge and understanding.
- Select, plan and carry out the most appropriate types of scientific enquiries to test any predictions, including identifying independent, dependent and control variables, where appropriate.
- Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety.
- Make and record observations and measurements using a range of methods for different investigations; and evaluate the reliability of methods and suggest possible improvements.
- Apply sampling techniques with analysis and evaluation.
- Apply mathematical concepts and calculate results and present observations and data using appropriate methods, including tables and graphs. This would be in line with cross curriculum criteria such as Maths, English and other subjects.
- Interpret any observations and resulting data, including identifying patterns and using observations, measurements and data to draw conclusions.
- Present reasoned explanations, including explaining data in relation to predictions and hypotheses
- Evaluate the resulting data, showing awareness of potential sources of random and systematic error.

- Develop a science based curiosity and identify further questions arising from their results.
- Understand and use the international system of units (SI units and IUPAC (International Union of Pure and Applied Chemistry)) and chemical naming protocols.
- Use and derive simple equations and carry out appropriate calculations (in keeping with cross curriculum for Maths).
- Undertake basic data analysis including simple statistical techniques

**AIMS** – The national curriculum for science aims to ensure that all pupils develop scientific knowledge and conceptual understanding through the specific disciplines of Chemistry, Biology and Physics. They will also develop understanding of the nature, processes and methodology of science through different types of science enquiries that help them to answer scientific questions about the real world that is around them. That they are also equipped with the scientific knowledge required to understand the uses and implications of science today and in the future.

**Term specific criteria including the progress to next year group and towards GCSE specific content.**

<u>Term</u>	<u>Yr 7</u> (ELC – Single) <u>Topics</u>	<u>Yr 8</u> (ELC- Double) <u>Topics</u>	<u>Yr9</u> (KS3- Intro to GCSE) <u>Topics</u>	<u>Yr 10</u> (GCSE) <u>Topics</u>	<u>Yr 11</u> (GCSE) <u>Topics</u>
<b>Term 1.1</b> (Autumn Term).  Chemistry	<ul style="list-style-type: none"> <li>• The Particulate nature of matter</li> <li>• Atoms, Elements and Compounds.</li> <li>• Pure and Impure Substances.</li> </ul>	<ul style="list-style-type: none"> <li>• Chemical Reactions</li> <li>• Acids and Alkalis</li> <li>• Metals and Non-metals</li> </ul>	<ul style="list-style-type: none"> <li>• Chemical and Energy Changes</li> </ul>	<ul style="list-style-type: none"> <li>• Atomic structure</li> <li>• The Periodic Table</li> <li>• Bonding, Structure and the properties of matter</li> </ul>	<ul style="list-style-type: none"> <li>• Rate and extent of Chemical Change</li> </ul>
<b>Term 1.2</b> (Autumn Term).  Chemistry	<ul style="list-style-type: none"> <li>• Atomic Structure</li> <li>• The Periodic Table</li> </ul>	<ul style="list-style-type: none"> <li>• Chemical Bonding</li> <li>• Chemical Changes</li> <li>•</li> </ul>	<ul style="list-style-type: none"> <li>• Energy Changes</li> <li>• Rate and Extend of Chemical Change</li> </ul>	<ul style="list-style-type: none"> <li>• Particle Model of Matter</li> <li>• Atomic Structure and Nuclear Radiation</li> <li>• Chemical Analysis</li> </ul>	<ul style="list-style-type: none"> <li>• Chemical and Allied Industries</li> <li>• Earth and Atmospheric Science</li> </ul>

<p><b>Term 2.1</b> (Spring Term).</p> <p><b>Biology</b></p>	<ul style="list-style-type: none"> <li>• Cells and Organisation</li> <li>• Skeletal and Muscular Systems</li> <li>• Reproduction (Both Plants and Animals)</li> </ul>	<ul style="list-style-type: none"> <li>• Respiration</li> <li>• Photosynthesis</li> </ul>	<ul style="list-style-type: none"> <li>• Cells and Transport</li> <li>• Organ Systems</li> </ul>	<ul style="list-style-type: none"> <li>• The Digestive System</li> <li>• Circulatory System</li> <li>• Plant Transport System</li> </ul>	<ul style="list-style-type: none"> <li>• Ecosystems</li> <li>• Evolution, Inheritance and Variation</li> </ul>
<p><b>Term 2.2</b> (Spring Term)</p> <p><b>Biology</b></p>	<ul style="list-style-type: none"> <li>• Ecosystems and Relationships</li> <li>• Genetics and Evolution</li> </ul>	<ul style="list-style-type: none"> <li>• Gas Exchange Systems</li> <li>• Cellular Respiration and Photosynthesis</li> <li>• Nutrition and Digestion</li> </ul>	<ul style="list-style-type: none"> <li>• Health and Lifestyles</li> <li>• Health, disease and the development of Medicines</li> </ul>	<ul style="list-style-type: none"> <li>• Transport Systems</li> <li>• Coordination and Control</li> </ul>	<ul style="list-style-type: none"> <li>• Evolution, Inheritance and Variation</li> </ul>
<p><b>Term 3.1</b> (Summer Term).</p> <p><b>Physics</b></p>	<ul style="list-style-type: none"> <li>• Waves</li> <li>• Sound Waves</li> <li>• Light Waves</li> </ul>	<ul style="list-style-type: none"> <li>• Current Electricity</li> <li>• Magnetism and Electromagnetism</li> </ul>	<ul style="list-style-type: none"> <li>• Energy</li> <li>• Forces</li> </ul>	<ul style="list-style-type: none"> <li>• Forces and Motion</li> <li>• Wave Motion</li> </ul>	<ul style="list-style-type: none"> <li>• Structure of Matter</li> <li>• Atomic Structure – Nuclear Model</li> <li>• Space Physics</li> </ul>
<p><b>Term 3.2</b> (Summer Term).</p> <p><b>Physics</b></p>	<ul style="list-style-type: none"> <li>• Earth Structure</li> <li>• The Universe (Space Physics)</li> </ul>	<ul style="list-style-type: none"> <li>• Motion and Forces</li> <li>• Pressure In Fluids</li> </ul>	<ul style="list-style-type: none"> <li>• Energy and Waves</li> <li>• Sound Waves</li> <li>• Light Waves</li> </ul>	<ul style="list-style-type: none"> <li>• Electricity</li> <li>• Magnetism and Electromagnetism</li> </ul>	<ul style="list-style-type: none"> <li>• Matter</li> <li>• Physical Changes</li> <li>• Particle Model</li> </ul>