

**INTENT-**

- To develop knowledge and understanding of key Biology, Chemistry and Physics topics
- Students to apply this knowledge and explain key ideas within Science, applying them to a range of typical and frequent assessment points.
- To develop basic practical skills and data analysis.

**The bigger picture:**

The year 9 curriculum continues to develop an understanding of key scientific concepts needed throughout the curriculum and creating a building block for later years. The curriculum is also designed to start developing an enquiring mind through key practical's that will allow for skills needed for Required practical's at GCSE to be built on.

**Bilton School Planning for Progress over Time  
Programme of Study 2024/25**

**IMPLEMENTATION**

|   | Term 1<br>Genetics & Variation,<br>Metals & Reactivity,<br>Electrolysis Project   |            |            |            |            |            |            |            | Term 2<br>Electrolysis Project,<br>Sound,<br>Unicellular Organisms   |            |            |            |            |            |            |            | Term 3<br>Unicellular Organisms,<br>Enzymes Project,<br>Types of Reaction   |            |            |            |            |            |            |                            | Term 4<br>Types of Reaction,<br>Pressure   |            |            |            |            |            |            |                             | Term 5<br>Pressure,<br>Acceleration Project,<br>Magnetism   |            |            |            |                            |            |            |            | Term 6<br>Light,<br>GCSE Transition Lessons   |            |            |            |  |  |  |  |
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| <b>KS3</b>  | 02/09/2024  | 09/09/2024 | 16/09/2024 | 23/09/2024 | 30/09/2024 | 07/10/2024 | 14/10/2024 | 21/10/2024 | <b>HOLIDAY:<br/>1 WEEK</b>   | 04/11/2024 | 11/11/2024 | 18/11/2024 | 25/11/2024 | 02/12/2024 | 09/12/2024 | 16/12/2024 | <b>HOLIDAY:<br/>2 WEEKS</b>   | 06/01/2025 | 13/01/2025 | 20/01/2025 | 27/01/2025 | 03/02/2025 | 10/02/2025 | <b>HOLIDAY:<br/>1 WEEK</b> | 24/02/2025   | 03/03/2025 | 10/03/2025 | 17/03/2025 | 24/03/2025 | 31/03/2025 | 07/04/2025 | <b>HOLIDAY:<br/>2 WEEKS</b> | 28/04/2025  | 05/05/2025 | 12/05/2025 | 19/05/2025 | <b>HOLIDAY:<br/>1 WEEK</b> | 02/06/2025 | 09/06/2025 | 16/06/2025 | 23/06/2025  | 30/06/2025 | 07/07/2025 | 14/07/2025 |  |  |  |  |
| <b>Year 9</b>   | TTD x 2, Genetic & Variation L1, 2<br>Genetics & Variation L3, 4, 4.5 (Mid Review)<br>Genetics & Variation L5, 6, 7RP.<br>Gen & Var L8RP, 9 (Revision), Metals & Reactivity L1<br><b>ETT</b> Metals & Reactivity L2, 3<br>Metals & Reactivity L4, 4.5 (Mid Review), 5<br>Metals & Reactivity L6, 7RP, 8RP, 9 (Revision)<br>Metals & Reactivity L9 (Revision), Electrolysis Project L1, 2  |            |            |            |            |            |            |            | Electrolysis Project L3, 4, 5<br>Electrolysis Project L6 (Review), <b>ETT</b><br>Sound L1, 2, 3<br>Sound L4, 4.5 (Mid review), 5<br>Sound L6, 7RP, 8RP, 9 (Review)<br>Sound L9 (Review), Unicellular Organisms L1, 2<br>Unicellular Organisms L3, 4, 4.5 (Mid Review)  |            |            |            |            |            |            |            | Unicellular Organisms L5, 6, 7+8RP<br>Uni Organisms, 9 (Revision), Enzymes Project L1, 2<br>Enzymes Project L3, 4, 5<br>Enzymes project L6, 7 (revision), <b>ETT</b><br>Types of Reaction L1, L2, L3<br>Types of Reaction L4, L4.5 (mid-review), L5   |            |            |            |            |            |            |                            | Types of reaction L6, L7RP, <b>Science Week Lesson</b><br>Types of Reaction L8RP, 9 (Revision), Pressure L1<br>Pressure L2, 3, 4<br>Pressure L4.5 (Mid review), 5, 6<br>Pressure L7+8RP, 9 (Revision), Acceleration Project L1<br>Acceleration Project L2, 3, 4<br>Acceleration Project L5, 6 (Review), <b>ETT</b> |            |            |            |            |            |            |                             | Magnetism L1, 2, 3<br>Magnetism L4, 4.5 (mid Review), 5<br>Magnetism L6, 7+8RP, 9 (Revision)<br>EOY Assessment Revision x 3   |            |            |            |                            |            |            |            | EOY Assessment Revision x 3<br><b>EOY Assessment</b> , Light L1, 2<br>Light L3, 4, EOY Assessment Review<br>Light L4.5, 5, 6<br>Light L7RP, 8RP, 9 (Revision)<br>GCSE Transition Lessons<br>GCSE Transition Lessons |            |            |            |  |  |  |  |
| <b>Progress and assessment</b>  | End of topic test (ETT)<br>Follow on questions to test previous knowledge through the Unit.<br>FAR completed approximately every 6 lessons.   |            |            |            |            |            |            |            | End of topic test (ETT)<br>Follow on questions to test previous knowledge through the Unit.<br>FAR completed approximately every 6 lessons.  |            |            |            |            |            |            |            | End of topic test (ETT)<br>Follow on questions to test previous knowledge through the Unit.<br>FAR completed approximately every 6 lessons.   |            |            |            |            |            |            |                            | Follow on questions to test previous knowledge through the Unit.<br>FAR completed approximately every 6 lessons.   |            |            |            |            |            |            |                             | End of topic test (ETT)<br>Follow on questions to test previous knowledge through the Unit.<br>FAR completed approximately every 6 lessons.   |            |            |            |                            |            |            |            |   |            |            |            |  |  |  |  |
| <b>Required Practical (RP)</b>  | Genetics and Variation: Variation in Seedlings<br>Analysing Data<br>Metals and Reactivity: Extracting Copper<br>Writing a risk assessment.  |            |            |            |            |            |            |            | Electrolysis Investigation<br>Sound: Investigating Waves<br>Making Observations  |            |            |            |            |            |            |            | Unicellular Organisms: Skills<br>Accuracy, Precision and Resolution.<br>Enzyme Investigation  |            |            |            |            |            |            |                            | Types of Reaction: Rate of Reaction<br>Comparing to Secondary Data<br>Pressure: Investigating Pressure<br>Calculations   |            |            |            |            |            |            |                             | Acceleration Investigation<br>Magnetism: Making Electromagnets<br>Graph/Method Writing  |            |            |            |                            |            |            |            | Light: Skills Variables   |            |            |            |  |  |  |  |
| <b>Homework</b><br><i>(ensure that this is NOT stand alone, but clearly advances or embeds knowledge and understanding)</i> | Educake Homework  |            |            |            |            |            |            |            | Educake Homework   |            |            |            |            |            |            |            | Educake Homework  |            |            |            |            |            |            |                            | Educake Homework   |            |            |            |            |            |            |                             | Educake Homework  |            |            |            |                            |            |            |            |   |            |            |            |  |  |  |  |
| <b>Key Vocabulary/literacy opportunities</b>  | Genetics and Variation: Variation, Inherited Variation, Environmental Variation, Continuous Variation, Discontinuous Variation, Genes, Adaptation, Competition, Natural Selection, Evolution, Extinction, Inherited Disorders, Cloning<br>Metals and Reactivity: Chemical change, Physical Change, Word Equation, Reactants, Products, Endothermic, Exothermic, Displacement, Ceramic, Polymer.<br><b>Guided Reading Activity:</b> Exploration of what it means for a species to be endangered and how this can happen. |            |            |            |            |            |            |            | Electrolysis: Electrolysis, Electrode, Electrolyte, Anode, Cathode, Ions.<br>Sound: Sound, Vibration, Waves, Longitudinal, Transverse, Amplitude, Pitch, Frequency, Ear, Echo, Ultrasound<br>Unicellular Organisms: Organism, Unicellular, Multicellular, Antibiotic, Budding.<br><b>Guided Reading Activity:</b> Exploration of the work of Edward Jenner and how his work contributed to the development of vaccinations still in use today. |            |            |            |            |            |            |            | Unicellular Organisms: Organism, Unicellular, Multicellular, Antibiotic, Budding.<br>Enzymes: Digestion, Digestive System, Enzyme, Protein, Active Site, Substrate, Product, Denature.<br>Types of Reaction: Chemical change, Physical Change, Word Equation, Reactants, Products, Fuel, Combustion, Conservation of Mass, Rate of Reaction, Thermal Decomposition. |            |            |            |            |            |            |                            | Types of Reaction: Chemical change, Physical Change, Word Equation, Reactants, Products, Fuel, Combustion, Conservation of Mass, Rate of Reaction, Thermal Decomposition.<br>Pressure: Pressure, Particle, Solid, Liquid, Gas, Fluid, Atmosphere, Surface Area, Floating, Sinking.                                 |            |            |            |            |            |            |                             | Magnets and Electromagnets: Magnet, Electromagnet, Magnetic Field, Coil, Current, Static Electricity<br>Light: Light, Wave, Reflection, Refraction, Spectrum, Convex, Concave, Eye.<br><b>Guided Reading Activity:</b> Exploration of what an electromagnet and how much of the modern technology we use depends on electromagnets. |            |            |            |                            |            |            |            | Light: Light, Wave, Reflection, Refraction, Spectrum, Convex, Concave, Eye.   |            |            |            |  |  |  |  |

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| <p><b>National Curriculum Links</b></p> | <p><b>Genetics and Variation:</b></p> <ul style="list-style-type: none"> <li>heredity as the process by which genetic information is transmitted from one generation to the next</li> <li>a simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model</li> <li>differences between species</li> <li>the variation between individuals within a species being continuous or discontinuous, to include measurement and graphical representation of variation</li> <li>the variation between species and between individuals of the same species means some organisms compete more successfully, which can drive natural selection</li> <li>changes in the environment may leave individuals within a species, and some entire species, less well adapted to compete successfully and reproduce, which in turn may lead to extinction</li> <li>the importance of maintaining biodiversity and the use of gene banks to preserve hereditary material.</li> </ul> <p><b>Metals and Reactivity</b></p> <ul style="list-style-type: none"> <li>chemical reactions as the rearrangement of atoms</li> <li>representing chemical reactions using formulae and using equations</li> <li>the order of metals and carbon in the reactivity series</li> <li>the use of carbon in obtaining metals from metal oxides</li> <li>properties of ceramics, polymers and composites (qualitative).</li> <li>the chemical properties of metal and non-metal oxides with respect to acidity.</li> <li>exothermic and endothermic chemical reactions (qualitative).</li> <li>reactions of acids with metals to produce a salt plus hydrogen</li> </ul> | <p><b>Sound:</b></p> <ul style="list-style-type: none"> <li>frequencies of sound waves, measured in hertz (Hz); echoes, reflection and absorption of sound</li> <li>sound needs a medium to travel, the speed of sound in air, in water, in solids</li> <li>sound produced by vibrations of objects, in loud speakers, detected by their effects on microphone diaphragm and the ear drum; sound waves are longitudinal</li> <li>auditory range of humans and animals.</li> </ul> <p><b>Unicellular Organisms:</b></p> <ul style="list-style-type: none"> <li>the structural adaptations of some unicellular organisms</li> </ul> | <p><b>Unicellular Organisms:</b></p> <ul style="list-style-type: none"> <li>the structural adaptations of some unicellular organisms</li> </ul> <p><b>Types of Reaction:</b></p> <ul style="list-style-type: none"> <li>chemical reactions as the rearrangement of atoms</li> <li>representing chemical reactions using formulae and using equations</li> <li>combustion, thermal decomposition, oxidation and displacement reactions</li> </ul> | <p><b>Types of Reaction:</b></p> <ul style="list-style-type: none"> <li>chemical reactions as the rearrangement of atoms</li> <li>representing chemical reactions using formulae and using equations</li> <li>combustion, thermal decomposition, oxidation and displacement reactions</li> </ul> <p><b>Pressure:</b></p> <ul style="list-style-type: none"> <li>atmospheric pressure, decreases with increase of height as weight of air above decreases with height</li> <li>pressure in liquids, increasing with depth; upthrust effects, floating and sinking</li> <li>pressure measured by ratio of force over area – acting normal to any surface.</li> </ul> | <p><b>Magnets and Electromagnets:</b></p> <ul style="list-style-type: none"> <li>magnetic poles, attraction and repulsion</li> <li>magnetic fields by plotting with compass, representation by field lines</li> <li>Earth's magnetism, compass and navigation</li> <li>the magnetic effect of a current, electromagnets, D.C. motors (principles only).</li> </ul> <p><b>Light:</b></p> <ul style="list-style-type: none"> <li>the similarities and differences between light waves and waves in matter</li> <li>light waves travelling through a vacuum; speed of light</li> <li>the transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface</li> <li>use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye</li> <li>light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras</li> <li>colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection.</li> </ul> | <p><b>Light:</b></p> <ul style="list-style-type: none"> <li>the similarities and differences between light waves and waves in matter</li> <li>light waves travelling through a vacuum; speed of light</li> <li>the transmission of light through materials: absorption, diffuse scattering and specular reflection at a surface</li> <li>use of ray model to explain imaging in mirrors, the pinhole camera, the refraction of light and action of convex lens in focusing (qualitative); the human eye</li> <li>light transferring energy from source to absorber leading to chemical and electrical effects; photo-sensitive material in the retina and in cameras colours and the different frequencies of light, white light and prisms (qualitative only); differential colour effects in absorption and diffuse reflection.</li> </ul> |
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| <p><b>Connected knowledge</b></p>                    | <p><b>Maths</b><br/>To interpreting graphs<br/>To draw scatter graphs<br/>To identify correlation</p> <p><b>KS4 Links</b><br/>Links to Inheritance, variation and evolution<br/>Links to DNA<br/>Links to Chemical changes<br/>Links to Types of reaction</p>  | <p><b>History</b><br/>Links to Edward Jenner and development of first antibiotics</p> <p><b>KS4 Links</b><br/>Links to chemical changes<br/>Links to Waves<br/>Links to Cell Biology</p> | <p><b>KS3 Links</b><br/>Links to Digestive system</p> <p><b>KS4 Links</b><br/>Links to Organisation<br/>Links to chemical changes</p>  | <p><b>Maths</b><br/>To find compound measures - speed, pressure and density</p> <p><b>KS3 Links</b><br/>Links to Forces and motion (Year 8)</p> <p><b>KS4 Links</b><br/>Links to Forces</p> | <p><b>Maths</b><br/>To calculate different quantities using formulae</p> <p><b>KS3 Links</b><br/>Links to Sound</p> <p><b>KS4 Links</b><br/>Links to Waves</p> | <p><b>Maths</b><br/>To calculate different quantities using formulae</p> <p><b>KS3 Links</b><br/>Links to Sound</p> <p><b>KS4 Links</b><br/>Links to Waves</p> |
| <p><b>Spiritual, Moral, Social and cultural.</b></p> | <p>Linking their understanding to the chemicals around them in everyday life.</p> <p>Understand the issues linked to plastic usage and the environment.</p>  |  | <p>Appreciating the work of scientists and the impact that they have had on life, society and culture – Edward Jenner.</p> <p>Linking their understanding to the chemicals around them in everyday life.</p>   | <p>Linking their understanding to the chemicals around them in everyday life.</p>   |  |  |
| <p><b>British Values</b></p>                         | <p>Respect and tolerance, collaboration during experiments and group work.</p> <p>Following the laboratory rules when conducting practical work.</p> <p>Understanding where variation comes from and having a mutual respect for those who are different from us.</p> <p>Recognise how our actions have an impact on others and the environment around us.</p> | <p>Respect and tolerance, collaboration during experiments and group work.</p> <p>Following the laboratory rules when conducting practical work.</p>                                     | <p>Respect and tolerance, collaboration during experiments and group work.</p> <p>Following the laboratory rules when conducting practical work.</p>   | <p>Respect and tolerance, collaboration during experiments and group work.</p> <p>Following the laboratory rules when conducting practical work.</p>  | <p>Respect and tolerance, collaboration during experiments and group work.</p> <p>Following the laboratory rules when conducting practical work.</p>           | <p>Respect and tolerance, collaboration during experiments and group work.</p> <p>Following the laboratory rules when conducting practical work.</p>           |
| <p><b>Cultural Capital</b></p>                       | <p>Science - Careers display on W side corridor.</p> <p>Understand how the plastics we use and the waste that we create affects the environment around us.</p>   | <p>Science - Careers display on W side corridor.</p> <p>Understand the impact of the advances in medicines/ diseases on everyday life.</p>   | <p>Science - Careers display on W side corridor.</p> <p>Understand the impact of the advances in medicines/ diseases on everyday life.</p> <p>Understand how scientific advancements have an impact in everyday life - Silverstone Trip (Science and Maths).</p> | <p>Science - Careers display on W side corridor.</p> <p>Understand where chemicals reactions impact their everyday life – e.g self-heating cans, handwarmers, cool packs etc.</p>           | <p>Science - Careers display on W side corridor.</p>   | <p>Science - Careers display on W side corridor.</p>   |