



CURRICULUM MAP (Long term plan)

SUBJECT : Science (Combined)

YEAR GROUP 10

	Cycle 1 Autumn	Cycle 2 Spring	Cycle 3 Summer
Substantive knowledge – Essential knowledge & conceptual understanding of the National Curriculum.	CB4 Evolution and Genetic Modifications CC9 Quantitative Chemistry SC14-16 Quantitative analysis (triple only) CP4-5 Waves & EM spectrum	CB5 Health & Disease CC8 Acids and Alkalis SC25-25-16 Qualitative analysis (triple only) CP6 Radioactivity	CB6 Photosynthesis CC16- 17 Fuels and Atmosphere CP7-8 Energy & Forces

<p>Disciplinary knowledge - what skills are practised?</p>	<p>CB4 Interpret diagrams relating evolution and which species originated from what. Interpret observations and 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 data, showing awareness of potential sources of random and systematic error. Understands 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. CC9 Apply mathematical concepts and calculate results CP4-5 The use of conventions in scientific communication. Apply mathematical concepts and calculate results. Present observations and data using appropriate methods, including tables and graphs Interpret observations and data, including identifying patterns and using observations, measurements and data to draw conclusions.</p>	<p>CB5 Understands 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. interpret observations and 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 data, showing awareness of potential sources of random and systematic error. CC8 interpret observations and 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 data, showing awareness of potential sources of random and systematic error. CP6 Interpreting of half life curves Understands 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.</p>	<p>CB6 understands 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. CC16-17 interpret observations and 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 data, showing awareness of potential sources of random and systematic error. CP7-8 interpret observations and 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 data, showing awareness of potential sources of random and systematic error. The use of conventions in scientific communication. Apply mathematical concepts and calculate results</p>
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<p>Key questions (What is the learning about?)</p>	<p>CB4 Can I use fossils and stone tools to provide evidence for human evolution? Can I describe how natural selection leads to evolution & explain the evidence which supports Darwin's theory? Can I use some evidence from scientists to support the idea of Natural selection including the pentadactyl limb? (triple only) Can I describe how organisms are classified into smaller and larger groups based on their characteristics? Can I describe genetic modification with an example? Can I provide evidence for evolution? Can I describe and explain the stages in genetic engineering? Can I explain the advantages of using tissue culture in medical research and the advantages of using tissue culture in plant breeding? Can I explain how crop plants can be modified to make them resistant to insects? What are the advantages and disadvantages of producing GM organisms? Can I explain what biological control is? What are the advantages and disadvantages of using biological control and using fertilisers on crops? (triple only) CC9 Can I calculate the relative molecular mass (Mr) of a compound given appropriate relative atomic masses(Ar)? Can I Predict & explain the law of conservation of mass applied to a closed system? Can I predict & explain the law of conservation of mass applied to a non-enclosed system involving a gas? Can I explain what is meant by a 'mole' and be able to calculate moles and mass using a formula. Can I calculate the molar ratio of a</p>	<p>CB5 Can I define health and distinguish between communicable and non communicable disease? Can I explain what communicable diseases have in common? Can I explain what causes Cardiovascular disease? Can I explain which pathogens cause some common infections? Can I explain how pathogens spread? Can I describe the physical and chemical barriers of the body to protect against infection? Can I explain how the immune system protects against pathogens? Can I create a storyboard to outline the human immune response? Can I explain how antibiotics can treat bacterial infections? Can I carry out the core practical? Can I understand what monoclonal antibodies are and how they are used? Can I describe the life cycle of a virus? Can I understand how plants defend against disease? Can I understand how plants defend against disease? (triple only) CC8 Can I recap Acids, Alkalis and Indicators? Can I explain the difference between dilute and concentrated solutions? Can I explain what is happening in a neutralisation reaction including acids and metal oxides? Can I understand alkalis and balance equations? Can I find if the pH of an acid changes when powdered magnesium hydroxide is added? Can I explain alkalis and neutralisation? Can I explain what happens when an acid reacts with a metal carbonate?</p>	<p>CB6 Can I describe and explain how plants make their own food? Can I describe the factors that affect Photosynthesis? Can I complete the CB6 core practical all about light intensity and photosynthesis? Can I explain the mechanisms by which plants absorb water & minerals? Can I explain how plants transport water and nutrients? Can I explain how the structure of a leaf is adapted for photosynthesis and gas exchange? Can I explain positive, negative phototropisms and Gravitropisms? How do auxins cause tropisms in shoots and roots? Can I explain how auxins are used by plant growers? What are the uses of gibberellins? (Triple only) CC16-17 Can I Explain what hydrocarbons are and their uses? Can I Understand how crude oil is separated into useful fractions, their names, properties and uses? Can I Understand the features of a homologous series of compounds? Can I understand what happens in complete and incomplete combustion of a hydrocarbon? Can I Explain the forms of pollution hydrocarbon fuels produce and their effects? Can I understand what cracking is and why it is needed? Can I explain what evidence is there for the composition of the earth's early atmosphere? Can I explain how primitive organisms changed carbon dioxide and oxygen levels? Can I explain and evaluate the link between fossil fuel combustion and climate change? Can I Explain how human activities influence the climate? CP7-8 Can I recall and use the equation</p>
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Assessment	PPC mid topic, based on a scientific skill, marked and then fix it time to improve End of unit assessment	PPC mid topic, based on a scientific skill, marked and then fix it time to improve End of unit assessment	PPC mid topic, based on a scientific skill, marked and then fix it time to improve End of unit assessment
Literacy (L), Numeracy (N), Oracy (O) opportunities	<p>Literacy & Communication skills distinguish between information and explanation text, use information and explanation texts to answer different types of questions</p> <p>Maths skills use appropriate units for area measurements, and calculate area for a variety of shapes, including rectangles and cuboids.</p> <p>Maths skills interpreting more complex graphs, substituting into formulae.</p>	<p>Literacy & Communication skills distinguish between information and explanation text, use information and explanation texts to answer different types of questions</p> <p>Maths skills use appropriate units for area measurements, and calculate area for a variety of shapes, including rectangles and cuboids.</p> <p>Maths skills interpreting more complex graphs, substituting into formulae.</p> <p>types of questions</p>	<p>Literacy & Communication skills distinguish between information and explanation text, use information and explanation texts to answer different types of questions</p> <p>Maths skills use appropriate units for area measurements, and calculate area for a variety of shapes, including rectangles and cuboids.</p> <p>Maths skills interpreting more complex graphs, substituting into formulae.</p>
Cross Curricular Opportunities		Resistant materials: properties of metals and metal alloys	
Careers	<p>HT1 How to become a pharmacologist: Mah Hussain's story - BBC Bitesize</p> <p>HT2 How to become a professor of Materials Chemistry: Saiful Islam's story - BBC Bitesize</p>	<p>HT1 BBC Bitesize - Medical careers: What qualifications do I need?</p> <p>HT2 Formula 1 engineers: How to work in F1 - BBC Bitesize</p>	<p>HT1 How to become an ecologist: Gabrielle's story - BBC Bitesize</p> <p>HT2 How to become a physicist: Mark Richards' story - BBC Bitesize</p>
Super Curriculum (personal development)	Astronomy Club for enrichment possibly leading to GCSE STEM challenge	Astronomy Club for enrichment possibly leading to GCSE STEM challenge	Astronomy Club for enrichment possibly leading to GCSE STEM Challenge
Equality and Diversity Gender Disability Religion Race Sexuality	<p>Diverse representation within text/ videos/website links shared.</p> <p>Display shows a variety of scientists of different genders and from different ethnicities</p> <p>Inspiring scientists: Sanjeev Gupta's story</p> <p>How to become a physicist: Mark Richards' story - BBC Bitesize</p> <p>Diversity and the Science Curriculum - BDSIP</p>	<p>Diverse representation within text/ videos/website links shared.</p> <p>Display shows a variety of scientists of different genders and from different ethnicities</p> <p>Diversity in science</p> <p>Guidance on Diversity and Equality</p>	<p>Diverse representation within text/ videos/website links shared.</p> <p>Diversity Matters in Education</p> <p>The Development of Children's Gender-Science Stereotypes: A Meta-analysis of 5 Decades of U.S. Draw-A-Scientist Studies - Miller - 2018</p> <p>Promoting Equality and Diversity in the Classroom Principles</p>

SMSC
Character Education

Character

Integrity : during practical work

Resilience: using equations & data handling

Confidence: participation during classroom discussions

