



Curriculum Map

Subject: Science

Year Group: 9

	Autumn 1/Autumn 2	Autumn 2	Autumn 2/Spring 1	Spring 2	Summer 1	Summer 2
<p>Content</p> <p>'Know What'</p>	<p>1 Independent Study and Maths Skills Graphs – bar charts, line graphs Calculations and algebra Standard form Powers</p> <p>2 Chemistry: Atomic Structure and Separating Mixtures The structure of the atom Sub atomic particles ions Electron configuration Chemical equations Separating mixtures – distillation, filtration, crystallisation, chromatography, fractional distillation The history of our understanding of the atom</p>	<p>1 Biology: Non-Communicable Diseases -Health and the effects of lifestyle on non communicable diseases -Causes and types of cancers</p>	<p>1 Physics: Waves Waves in air, fluids and solids 2.Properties of waves</p>	<p>2 Chemistry: Periodic Table (Groups) Learn how the Periodic Table developed over time Learn about the chemistry and properties of the elements in Groups 0, 1 and 7 of the Periodic Table. Identify patterns in the properties of elements and learn how to use the periodic table to predict properties</p>	<p>1 Biology: Biodiversity How the human population has grown over time Different types of pollution – land, air, water, deforestation, peat destruction – the causes, effects, and possible ways of reducing the impact.</p> <p>2 Physics: Electromagnetic Waves Types of EM waves Properties of EM waves Uses and applications of EM waves</p>	<p>1 Biology: B16 Organising an Ecosystem Feeding relationships Carbon Cycle Decay Cycle Water Cycle 3 STEM – Careers 4 Literacy in Science</p>

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Skills 'Know How'	Explain the structure of an atom Work out protons, neutrons, electrons, atomic number and mass number for different elements. Work out electron configuration for the first 20 elements Safely carry out experiments to separate different mixtures – become proficient at filtration, evaporation and crystallisation, chromatography and simple distillation experiments	Record, present and interpret observations and data, including identifying patterns and using observations, measurement and data to draw conclusions	Equation application 1.Students should be able to apply equations for: Period/frequency the wave equation Practical Experiments 1.Observations about apparatus for measuring speed, frequency and wavelength 2.Investigate reflection of light	Use the periodic table to predict properties of elements in groups 1, 7 and 0 Write word equations and balanced symbol equations for a variety of chemical reactions Explain trends down groups and across periods in the periodic table	Equation Application 1.Students should be able to apply equations for: Period/frequency the wave equation Practical Experiments Investigate amount of infra-red absorbed/radiated at a surface	Record, present and interpret observations and data, including identifying patterns and using observations, measurement and data to draw conclusions. <ul style="list-style-type: none"> • Use appropriate techniques, apparatus, and materials during fieldwork and laboratory work, paying attention to health and safety. • Select, plan, and carry out the most appropriate types of scientific enquiries to test predictions, including identifying independent, dependent, and control variables, where appropriate. • Make predictions using

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						scientific knowledge and understanding. <ul style="list-style-type: none"> • Present reasoned explanations, including explaining data in relation to predictions and hypotheses.
Key questions	How are atoms different from each other? How can we separate mixtures? How and why has the atomic model changed over time?	What are non-communicable diseases? What are lifestyle factors and causal mechanisms? What are the impacts of non-communicable diseases?	How do we measure waves and how fast do they travel? What are the properties of transverse waves and longitudinal waves? What is the relationship between speed, frequency and wavelength? How can we explain reflection and refraction of waves? How can we investigate the properties of sound waves?	How has the Periodic Table developed over time? How is an element's position in the Periodic Table linked to its atomic number and electronic structure? What are the trends in properties and behaviour in group 1, 7 and 0 elements?	1 What is biodiversity and why is it important? What effects have human population growth had on biodiversity? What can we learn about the causes and effects of different types of pollution? How can we maintain bioiversity? 2 What are the different parts of the electromagnetic spectrum? What are the properties and uses of each	What are feeding relationships? What is the relationship between predators and prey? How are carbon, nitrogen and water constantly recycled?

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					different type of wave in the electromagnetic spectrum?	
Assessment	Low stakes Knowledge Test at end of topics to build a secure base of scientific knowledge Literacy and numeracy tasks within topics.	Knowledge test at end of topic to build a secure base of scientific knowledge. Literacy and numeracy tasks within topics. Summative End of Term Exam to assess knowledge, understanding and application.	Knowledge test at end of topics to build a secure scientific knowledge base. Literacy and numeracy tasks within topics	Knowledge test at end of topic to build a secure knowledge base. Literacy and numeracy tasks within each topic. Summative end of Term Exam to assess knowledge, understanding and application.	Knowledge test at end of topics to build a secure base of scientific knowledge. Literacy and numeracy tasks within each topic.	Low Stakes Knowledge test at end of topic to build a secure knowledge base. Literacy and numeracy tasks within each topic. Summative end of Term Exam to assess knowledge, understanding and application.
Literacy/ Numeracy/ SMSC/ Character	Literacy – explain the difference between atoms and molecules, elements, and between compounds and mixtures. Write about the history of the atom and how our understanding has developed over time. Numeracy – balance symbol equations; calculate	Literacy -Higher tier vocabulary on specific diseases. - Develop extended answers through practice of 6 mark questions. - Development of comprehension skills through research using a variety of sources. Numeracy - Understanding of size and scale - Analysis of numerical data when considering	Literacy - Appropriate use of tier three vocabulary. - Develop extended answers through practice of 6 mark questions. -Plan experiments or devise procedures to make observations - Development of comprehension skills through research using a variety of sources. Numeracy	Literacy Using scientific models to explain trends in the periodic table. Using historical information to explain the importance of Mendeleev's ideas. Numeracy – sub atomic particles, mass number, atomic number.	Literacy – extended writing about various problems caused by different types of pollution, and possible solutions. Numeracy – interpreting scientific data from tables and graphs. Explaining trends in such data. SMSC/Character – gain an appreciation of how our society and activities are	Record, present and interpret observations and data, including identifying patterns and using observations, measurement and data to draw conclusions.

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	<p>neutrons, protons and electrons using mass number and atomic number.</p> <p>Work out electronic structure of atoms of different elements.</p> <p>SMSC/Character – develop practical skills and apply scientific knowledge in practical situations to solve problems.</p>	<p>risk factors - Interpretation of graphs e.g. scatter graphs to identify correlations SMSC - Evaluating lifestyle choices -Sensitivity to others when discussing topics such as diseases - Evaluating which treatments should be available on the NHS Character -Tolerance - Showing tolerance to other people and their lifestyle choices</p>	<p>Calculations using scientific equations</p> <p>Rearranging equations</p> <p>Powers</p> <p>Standard Form</p> <p>Calculating means</p> <p>Translating numerical data into graphical forms</p> <p>Character - Confidence - Building confidence in practical skills with the completion of a required practical.</p>		<p>harming the planet and propose sensible solutions.</p>	