Year 8 Chemistry Curriculum – 2022-2023

	Autumn Term		Spring Term		Summer Term	
	1	2	1	2	1	2
Key Concepts	Matter		Reactions		Earth	
National Curriculum Knowledge & Understanding	**Atoms, Elements and Compounds** * A simple (Dalton) atomic model * Differences between atoms, elements and compounds * Chemical symbols and formulae for elements and compounds * Representing chemical reactions using formulae and using equations * Polymers and composites	**The Periodic Table** * The varying physical and chemical properties of different elements * The principles underpinning the Mendeleev Periodic Table * Periods and groups; metals and non-metals * How patterns in reactions can be predicted with reference to the Periodic Table	**Types of reaction** * Chemical reactions as the rearrangement of atoms * Combustion, thermal decomposition and displacement reactions * Conservation of mass changes of state and chemical reactions.	**Chemical Energy** * Energy changes on changes of state (qualitative) * Exothermic and endothermic chemical reactions (qualitative) * What catalysts do.	**Climate** * The carbon cycle * The composition of the atmosphere * The production of carbon dioxide by human activity and the impact on climate	**Earth's Resources** * The order of metals and carbon in the reactivity series * The use of carbon in obtaining metals from metal oxides * Earth as a source of limited resources and the efficacy of recycling
Assessment	SKIMP (Southmoor Key Informative Marking Point) Elements and Compounds	End of Term / Unit Assessment Chemistry	SKIMP Chemical Energy	End of Term / Unit Assessment Chemistry	SKIMP Earth's Resources	End of Year Assessment Chemistry 1hr per paper
Why this?	Atoms, Elements	Pupils have met	This topic builds	This topic is	By this point,	The final topic is

Why now?	and Compounds is taught at this point as pupils now understand that all substances are made from particles. This will now be developed further to relate to the atom as well as making prior links with concepts from Metals and Non-metals and the basic structure of the periodic table. Further links are made back to the Earths Structure module, where pupils were introduced to the notion of properties of compounds. Pupils have previously studied word equations in the topic Acids and Alkalis, Metals and Non-metals, which will now	several concepts underpinning the big picture of this Periodic Table topic of learning. For example, atoms and elements from the previous module, Pure and Impure Substances at the beginning of year 7 and Metals and Non-metals from later in year 7. Conclusions can be drawn, while opening new areas of learning in year 9, where pupils will investigate how the Periodic Table was developed.	on knowledge from the Year 7 overarching modules from Chemical Reactions in terms of Acids and Alkalis. It further practices chemical equations and from Metals and Non-metals where the reactions of metals with acids was studied. This will now develop the rearrangement of atoms linking it to the conservation of mass, while also being an introduction to studying reactions and changes in energy in the following topic of Chemical Energy. .	taught later in year 8 as concepts within are becoming increasingly more complex to include energy level diagrams, of which an understanding of energy from the year 7 Physics topic of Energy is drawn i.e. Energy as a quantity that can be quantified and calculated where they will link this to endothermic and exothermic reactions by making calculations is needed. It introduces the definition of a catalyst and how a catalytic converter works which will then be linked to the later topic of Climate when will see how this equipment can be used to	pupils will know from the Periodic Table earlier in the year that carbon is a non-metal element and from the Atoms, Elements and Compounds topic that it is also a constituent of the compound carbon dioxide. In year 7 Interdependence module pupils studied food chains and this is a precursor for the understanding of the carbon cycle. Earlier in year 8 from the biology topic of Cellular Respiration pupils will know that carbon dioxide is produced in respiration, and from the topic Photosynthesis that it is a reactant for the process of photosynthesis.	taught at this point as it has prior links to year 7 Metals and Non-metals such as properties of metals also to Earth's Structure in year 7, where pupils met the concept of recycling rocks. This was the starting point for discovering where these metals originate from i.e. in the Earths crust. As pupils now comprehend chemical reactions, they can now apply this to understand how metal extraction depends on chemical reactions. Further to this they will make links back to the previous topic of Climate to explain that the recycling of

	increase in complexity as they are introduced to chemical formulae to represent elements, compounds and molecules. This will be carried across to the biology topic Cellular Respiration which is taught later in year 8 so pupils can build on the word equation and can subsequently challenge their knowledge to use chemical formulae to show the relevant equations, rather than just using word equations.			reduce the impact humans have on the environment.	This module will draw on these cross curricular key themes so that the processes behind the recycling of carbon can be studied. It also incorporates knowledge of radiation from the earlier topic in Year 8, Heating and Cooling in Physics.	metals is more advantageous to the environment in terms of reducing carbon footprint.
Skills & Characteristics	**Listening** Pupils will have opportunities to develop their listening skills throughout the academic year, specifically when being given instructions for investigative work for e.g. displacement reactions. They will also listen to each other throughout group work and opportunities for presenting their work. **Problem Solving** Pupils will use problem solving skills when evaluating the results from investigative processes. They will work collaboratively to explain the results of their practical experiments using scientific reasoning.					

<table>
<tr><td></td><td colspan="6">Aiming High
All pupils will set clear, tangible goals and which can especially be met during investigative work when following methods and use of level ladders in tasks.
Teamwork: Pupils will be required to work in a group whilst carrying out practical work or problem-solving activities showing that these skills are necessary in the world of work irrespective of career choice.</td></tr>
<tr><td rowspan="2">Aspirations & Careers</td><td>The science involved in this area correlates with:-
* Chemical engineer
* Energy manager
* Production manager</td><td>The science involved in this area correlates with:-
* Furniture designer
* Chemical metallurgist
* Chemist</td><td>The science involved in this area correlates with:-
* Chemical technician
* Teacher of chemistry
* Forensic scientist</td><td>The science involved in this area correlates with:-
* Product design
* Chemical engineer
* Research scientist</td><td>The science involved in this area correlates with:-
* Gardener
* Farmer
* Environmental scientist</td><td>The science involved in this area correlates with:-
* Recycling operative
* Chartered engineer
* Mining</td></tr>
<tr><td colspan="6">CEIAG
Medical Experience days
Careers Fairs
Work Experience
Cultural Capital
Pupils are encouraged to make links between current events, such as using hybrid vehicles and climate change and our Chemistry learning in the classroom.
All pupils take advantage of our excellent links with the RSC and Newcastle University for off site visits and in school activities.
Extracurricular
Stem Club
Durham University
Chemistry Lecture series</td></tr>
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Year Group	Basic (Lower Ability End Points)	Clear (Middle Ability End Points)	Detailed (Higher Ability End Points)

8	Pupils use knowledge and understanding of materials, their properties and the Earth to sort materials into groups in a variety of ways, according to their properties. They explain the ways in which some materials are suited to specific purposes such as glass for windows or copper for electrical cables. They classify changes in materials as reversible, such as water freezing, and non-reversible, such as baking of cakes. They use simple scientific ideas with evidence they have collected to give explanations of their observations, linking cause and effect, for example the evaporation of water. They recognise and explain the purpose of a variety of scientific and technological developments in their everyday lives, for example sustainable packaging. **Working Scientifically** Pupils respond to suggestions and put forward their own ideas about how to investigate an idea or find answers to questions. They recognise why it is important to collect data to investigate ideas and answer questions, and use texts to find information. They begin to recognise risks with help. They make relevant observations and measure quantities, such as length or mass, selecting and using a range of simple equipment. They carry out fair tests with some help, recognising and explaining what makes them fair. They record findings in a variety of ways, including tables or charts. They give explanations for observations and for patterns in measurements they have made and recorded. They communicate in a scientific way what they have found out and suggest improvements in their work.	Pupils recall simple scientific knowledge and terminology of the properties and classification of materials such as rocks. They describe some phenomena and processes, such as separation methods, drawing on scientific knowledge and understanding. They recognise that evidence can support or refute scientific ideas, for example the classification of reactions as reversible and irreversible. They recognise some applications and implications of science, such as the safe use of acids and alkalis. **Working Scientifically** Pupils decide on an appropriate approach, including using a fair test to answer a question, and select suitable equipment and information from that provided. They select and use methods that are adequate for the task. Following instructions, they take action to control obvious risks to themselves. They make a series of observations and measurements and vary one factor while keeping others the same. They record their observations, comparisons and measurements using tables and bar charts and begin to plot points to form simple graphs. They interpret data containing positive and negative numbers. They begin to relate their conclusions to patterns in data, including graphs, and to scientific knowledge and understanding. They communicate their conclusions using appropriate scientific language. They suggest improvements in their work, giving reasons.	Pupils recall straightforward scientific knowledge and terminology of materials and their properties. They describe phenomena and processes, drawing on abstract ideas. They explain processes and phenomena such as the development of the periodic table using more than one step or using a model. They apply and use knowledge and understanding in familiar contexts, such as identifying changes of state. They recognise that both evidence and creative thinking contribute to the development of scientific ideas, such as basing separation methods for mixtures on physical and chemical properties. They describe applications and implications of science, such as the uses of metals based on their specific properties. **Working Scientifically** Pupils decide appropriate approaches to a range of tasks, including selecting sources of information and apparatus. They select and use methods to obtain data systematically. They recognise hazard symbols and make, and act on, simple suggestions to control obvious risks to themselves and others. They use line graphs to present data, interpret numerical data and draw conclusions from them. They analyse findings to draw scientific conclusions that are consistent with the evidence. They communicate these using scientific and mathematical conventions and terminology. They evaluate their working methods to make practical suggestions for improvements.