

Chemistry

Year 7

School Vision	Challenging all of our students supportively to become confident and curious enhancing lives now and in the future		
Faculty Intent	“To engender a desire and passion to learn and be Inspired in STEM subjects, experiencing STEM outside the class - applying learning in unfamiliar situations. “		
Subject Intent	“To develop a love of science in all and a thirst for knowledge of the world around them.”		
	Term 1	Term 2	Term 3
Topic Name	Matter 1	Reactions 1	Earth 1
Key Content	<i>Particle model, changes of state and how to physically separate substances</i>	<i>Metals and non-metals. Reactions of acids and alkalis.</i>	<i>Understanding the structure of the Earth and the Rock Cycle, and looking at the organisation of the Universe</i>
Intent			
How does this link to your intent?	Students will develop what they learned about states of matter in Key Stage 2 to explain the properties of solids, liquids and gases using the particle model and use it to classify materials in the world around them. They will learn to apply the model to explain particular phenomena, such as changes of state, thermal expansion, diffusion, density, concentration and pressure. Students will extend and further develop their ideas on separation from KS2 and develop practical skills and problem-solving skills through the context of separating mixtures.	Students will develop what they learned about the properties of materials at KS2 to explore the physical and chemical properties of metals and non-metals, linking these to real-life uses. Students will learn about the characteristics of chemical change and explore some specific types of chemical reaction and how they are used in the real world, for example neutralisation in the treatment of heartburn. Students are also introduced to the concept of representing chemical reactions in word and symbol equations, and understanding how particles are rearranged, linking to Matter 1.	Students look at what is beneath and above them and gain understanding into how The Earth and Universe are formed from matter. They will build on knowledge of the seasons and day/night from KS2 using a variety of models to explain the changes.
Sequencing			
Why this and why now?	Understanding that everything is made of particles is fundamental to whole of science.	Builds on ideas from Matter 1 and introduces the concept of particles being	Provides students with the opportunity to revisit concepts they may have

		rearranged during chemical reactions developing the fundamental skills of writing word and symbol equations.	learned in other subjects such as Geography and Physics
National Curriculum Audit			
Particulate nature of matter	✓		
Atoms elements and compounds	✓		
Pure and impure substances	✓		
Chemical reactions		✓	
Energetics			
Periodic Table			
Materials			
Earth & Atmosphere			✓
Key concepts / Vocabulary			
12 or less	• Solid • Liquid • Gas • Melting • Boiling • Evaporate • Condense • Diffusion	• Magnetic • Salt • Acid • Base • Alkali • Concentration • Indicator • Neutralisation	• Sedimentary • Igneous • Metamorphic • Crust • Core • Weathering • Tectonic Plate • Seasons

Assessment			
Type	Mid and end of topic test – multiple choice and short answer questions	Mid and end of topic test – multiple choice and short answer questions	Mid and end of topic test – multiple choice and short answer questions
Why this style of assessment and why now?	Prepare students for the assessment format used at KS4	Prepare students for the assessment format used at KS4	Prepare students for the assessment format used at KS4

Year 8

School Vision	Challenging all of our students supportively to become confident and curious enhancing lives now and in the future		
Faculty Intent	“To engender a desire and passion to learn and be Inspired in STEM subjects, experiencing STEM outside the class - applying learning in unfamiliar situations. “		
Subject Intent	“To develop a love of science in all and a thirst for knowledge of the world around them.”		
	Term 1	Term 2	Term 3
	Matter 2	Reactions 2	Earth 2
Key Content	<i>The Periodic Table; Atoms, elements, compounds and mixtures; materials and their uses</i>	<i>Energy changes in exothermic and endothermic reactions</i>	<i>The Atmosphere; Human Impact on the Atmosphere and how it can be managed</i>
Intent			
How does this link to your intent?	Students gain an appreciation of how scientific ideas change and develop over time. They explore different groups in the periodic table and how elements properties link to common uses, for example chlorine. They develop the skill of writing word and	Students study how chemical reactions occur and why certain reactions have certain characteristics. They use combustion and thermal decomposition as examples and consider the differences between the two and applications of	Students learn about the composition of the Earth’s atmosphere and how it has changed over time. They learn how human activities have affected the Earth and its resources and how

	symbol equations introduced in Matter 1 and Reactions 1. Students investigate the properties of common materials such as composites and ceramics and link these to their uses in real life.	each. They are also encouraged to think about the environmental impacts of combustion, linking to real-world issues such as climate change.	changes can be made to limit this impact.
Sequencing			
Why this and why now?	Builds on key concepts such as word and symbol equations introduced in Matter 1 and Reactions 1 which provides a strong foundation for balancing symbol equations in KS4.	Chemical reactions and energy changes are taught again at GCSE and this topic gives a basic understanding of key terminology and concepts.	Links to example of chemical reactions encountered in Reactions 2. Students are challenged to think about the impact they have on the world around them.
National Curriculum Audit			
Particulate nature of matter	✓		
Atoms elements and compounds	✓		
Pure and impure substances	✓		
Chemical reactions		✓	
Energetics		✓	
Periodic Table	✓		
Materials			✓
Earth & Atmosphere			✓

Key concepts / Vocabulary			
12 or less	• Periodic table • group • period • Chemical reaction • Reactivity • Physical properties • prediction • molecules	• Exothermic • Endothermic • Physical • Chemical • Bonds • Catalyst • Decomposition • Combustion	• Carbon Cycle • Photosynthesis • Respiration • Greenhouse effect • Correlation • Causation • Displacement • Finite
Assessment			
Type	Mid and end of topic test – multiple choice and short answer questions	Mid and end of topic test – multiple choice and short answer questions	Mid and end of topic test – multiple choice and short answer questions
Why this style of assessment and why now?	Prepare students for the assessment format used at KS4	Prepare students for the assessment format used at KS4	Prepare students for the assessment format used at KS4

Year 9

School Vision	Challenging all of our students supportively to become confident and curious enhancing lives now and in the future
Faculty Intent	“To engender a desire and passion to learn and be Inspired in STEM subjects, experiencing STEM outside the class - applying learning in unfamiliar situations. “
Subject Intent	“To develop a love of science in all and a thirst for knowledge of the world around them.”

	Term 1	Term 2	Term 3
	AQA GCSE Unit 1 – Atomic Structure and the Periodic Table		AQA GCSE Unit 2 – Bonding and Properties of Matter
Key Content	The periodic table provides chemists with a structured organisation of the known chemical elements from which they can make sense of their physical and chemical properties. The historical development of the periodic table and models of atomic structure provide good examples of how scientific ideas and explanations develop over time as new evidence emerges. The arrangement of elements in the modern periodic table can be explained in terms of atomic structure which provides evidence for the model of a nuclear atom with electrons in energy levels		Chemists use theories of structure and bonding to explain the physical and chemical properties of materials. Analysis of structures shows that atoms can be arranged in a variety of ways, some of which are molecular while others are giant structures. Theories of bonding explain how atoms are held together in these structures. Scientists use this knowledge of structure and bonding to engineer new materials with desirable properties. The properties of these materials may offer new applications in a range of different technologies.
Intent			
How does this link to your intent?	Students see how Scientific ideas develop over time and how atomic structure relates to the chemical properties of elements allowing them to understand why certain materials may be used for certain functions.		Students gain an understanding of why certain materials have certain properties and so why they are chosen for specific uses.
Sequencing			
Why this and why now?	Transition into GCSE Chemistry building on key concepts learnt in Matter 1 and 2		Transition into GCSE Chemistry building on key concepts learnt in Matter 1 and 2 and Reactions 1
National Curriculum Audit			
Particulate nature of matter	✓		
Atoms elements and compounds	✓		
Pure and impure substances	✓		

Chemical reactions		
Energetics		
Periodic Table	✓	
Materials		✓
Earth & Atmosphere		
Key concepts / Vocabulary		
12 or less	• Atomic number • Proton • Neutron • Electron • Isotope • Alkali metals • Noble gases • Halogens	• Ionic • Covalent • Charge • Ion • Melting Point • Boiling Point • Conductivity • Formula
Assessment		
Type	Mid and end of topic test – multiple choice, short answer and 6 mark questions from past papers.	Mid and end of topic test – multiple choice, short answer and 6 mark questions from past papers.
Why this style of assessment and why now?	Practice exam technique and application of knowledge which is what most students tend to struggle with.	Practice exam technique and application of knowledge which is what most students tend to struggle with. How they will be assessed formally at the end of the course.

	How they will be assessed formally at the end of the course.	
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Year 10

School Vision	Challenging all of our students supportively to become confident and curious enhancing lives now and in the future					
Faculty Intent	“To engender a desire and passion to learn and be Inspired in STEM subjects, experiencing STEM outside the class - applying learning in unfamiliar situations. “					
Subject Intent	“To develop a love of science in all and a thirst for knowledge of the world around them.”					
Exam Board & Specification						
	Term 1		Term 2		Term 3	
	1	2	3	4	5	6
Topic Name	Quantitative Chemistry	Chemical Changes	Chemical Changes	Energy Changes	The Rate and extent of chemical change	The rate and extent of chemical change
Key Content	Relative moles and mass Conservation of mass Reacting Masses Yield and atom Economy Gas volumes Concentration of solutions	Reactions of metals Extraction of metals	Reactions of acids Making salts Electrolysis	Exothermic and endothermic reactions Chemical cells and fuel cells	Rates of Reaction	Dynamic equilibrium
Intent						

How does this link to your intent?	Students see how Scientific ideas develop over time and how atomic structure relates to the chemical properties of elements allowing them to understand why certain materials may be used for certain functions	Students gain an understanding of why certain materials have certain properties and so why they are chosen for specific uses.	Students will gain an analytical knowledge of the world around them. They will learn the mathematical skills to learn how to perform a range of calculations.	Students will learn that chemistry is all about making useful substances from everyday resources and to do this we need to carry out chemical reactions.	Students will explore how some chemical reactions release thermal energy and increase the temperature while other reactions lower the temperature and make links with the world around us.	Students will develop an understanding about how some chemical reactants are reversible and can be controlled by changing conditions.
Sequencing						
Why this and why now?	Transition into AS level Chemistry building on key concepts learnt in Matter 1 and Matter 2	Transition into AS Chemistry building on key concepts learnt in Matter 1 and 2 and Reactions 1	Transition into AS Chemistry building on key concepts learnt in Reactions 2	Transition into AS Chemistry building on key concepts learnt in Reactions 2	Transition into AS Chemistry building on key concepts learnt in Earth 2	Transition into AS Chemistry building on key concepts learnt in Earth 2
Key concepts / Vocabulary						
12 or less	• Atom • Nucleus • Energy level/shell • Atomic number • Mass number • Relative atomic Mass • Electron • Proton		• Giant Lattice • Ionic bonding • Molecules • Covalent bond	• Relative atomic mass • Relative formula mass • Mole • Avagadro constant	• Oxidation • Reduction • Displacement • Ores • Acid • Alkali • Electrolytes	• Exothermic • Endothermic • Activation Energy • Cell • Battery • Fuel cell

	• Neutron • Ion • Element • Compound		• Intermolecular forces • Polymer • State • Malleable • alloy		• Conservation of mass • Thermal decomposition • Excess • Limiting factor • Percentage yield	•	
Description	Use of Seneca Use of workbook Past exam questions.	Use of Seneca Use of workbook Past exam questions.	Use of Seneca Use of workbook Past exam questions.	Use of Seneca Use of workbook Past exam questions.	Use of Seneca Use of workbook Past exam questions.	Use of Seneca Use of workbook Past exam questions.	Use of Seneca Use of workbook Past exam questions.
Assessment							
Type	Formative assessment in lessons with prior knowledge challenged. Summative end of topic test.	Formative assessment in lessons with prior knowledge challenged. Summative end of topic test.	Formative assessment in lessons with prior knowledge challenged. Summative end of topic test.	Formative assessment in lessons with prior knowledge challenged. Summative end of topic test.	Formative assessment in lessons with prior knowledge challenged. Summative end of topic test.	Formative assessment in lessons with prior knowledge challenged. Summative end of topic test.	Formative assessment in lessons with prior knowledge challenged. Summative end of topic test.
Why this style of assessment and why now?	Tracking of student progress.	Tracking of student progress.	Tracking of student progress.	Tracking of student progress.	Tracking of student progress.	Tracking of student progress.	Tracking of student progress.

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Exam Board & Specification						
	Term 1		Term 2		Term 3	
	1	2	3	4	5	6
Topic Name	Organic Chemistry	Chemical Analysis	Chemistry of the Atmosphere	Formulae and Equations	Revision and Exam Practice	Revision and Exam Practice
Key Content	Crude Oil and Alkanes Cracking and Alkenes Alcohols Carboxylic acids and Esters Polymers Biochemistry	Purity Formulations and chromatography Identification of common gases Common atmospheric pollutants	Using the Earths Resources Using the earths resources The use of water Metals and other materials Making fertilisers	Writing formulae Classifying substances Common reactions Balancing equations Ionic equations Half equations		
Intent						
How does this link to your intent?	The number of organic compounds that exist is greater than all other compounds put together. The world around us is full of medicines, detergents, fibres and	There are many mixtures on this earth including blood. It is very important that we can identify these substances and how much of them are present.	Students will gain an understanding of the earths atmosphere and how it has evolved over time. This will give them the knowledge to	Chemists use formulae and equations as a quick way of identifying substances and showing what happens in chemical reactions.		

	polymers which are all carbon compounds also our bodies.	Analysis is a key area of chemistry used to measure and identify the purity of substances.	make informed decisions regarding climate change.			
Sequencing						
Why this and why now?	Transition into AS level Chemistry building on key concepts learnt in Matter 1 and Matter 2	Transition into AS level Chemistry building on key concepts learnt in Matter 1 and Matter 2	Transition into AS level Chemistry building on key concepts learnt in Chemical reactions 2	Transition into AS level Chemistry building on key concepts learnt in chemical reactions 2	Revision and exam practice for GCSE exams	Revision and exam practice for GCSE exams
Key concepts / Vocabulary						
12 or less	• Crude oil • alkane • alkene • Fractional distillation • Homologous series • biomass • hydrocarbon • Combustion • viscosity		• Pure substance • formulation • chromatography • precipitate • Rf value • antifreeze • analysis • mixture	• Diatomic • Spectator ions • Precipitation • Electrolysis •		

Description	Use of Seneca Use of workbook Past exam questions	Use of Seneca Use of workbook Past exam questions	Use of Seneca Use of workbook Past exam questions	Use of Seneca Use of workbook Past exam questions	Use of Seneca Use of workbook Past exam questions	Use of Seneca Use of workbook Past exam questions
Assessment						
Type	Formative assessment in lessons with prior knowledge challenged. Summative end of topic test. Mock Exams	Formative assessment in lessons with prior knowledge challenged. Summative end of topic test. Mock exams	Formative assessment in lessons with prior knowledge challenged. Summative end of topic test. Mock exams	Formative assessment in lessons with prior knowledge challenged. Summative end of topic test. Mock exams	Formative assessment in lessons with prior knowledge challenged. Summative end of topic test. Mock exams	Formative assessment in lessons with prior knowledge challenged. Summative end of topic test. Mock exams
Why this style of assessment and why now?	Tracking of student progress	Tracking of student progress	Tracking of student progress	Tracking of student progress	Tracking of student progress	Tracking of student progress

Y12

School Vision	Challenging all of our students supportively to become confident and curious enhancing lives now and in the future					
Faculty Intent	“To engender a desire and passion to learn and be Inspired in STEM subjects, experiencing STEM outside the class - applying learning in unfamiliar situations. “					
Subject Intent	“To develop a love of science in all and a thirst for knowledge of the world around them.”					
Exam Board & Specification						
	Term 1		Term 2		Term 3	
	1	2	3	4	5	6
Topic Name	Atomic Structure Models of atomic	Ionic Bonding Covalent Bonding	Periodicity	Alkanes and Halogenoalkanes	Addition Polymers Alcohols	Exam practice

Key Content	structure Relative Mass and mass spectrometer Electronic Structure Ionisation Energy Trends in ionisation energy The mole Equations and calculations Titrations Formula, yield and atom economy	Shape of molecules Polarisation and intermolecular forces Metallic bonding and properties of materials Enthalpy changes Calorimetry Hess's Law Reaction Rates Reversible reactions Equilibrium constant Redox Reactions	Group 2 and group 7 elements Halide ions Tests for ions Introduction to organic chemistry isomerism	Alkanes and petroleum Alkanes as fuels Chloroalkanes and CFC's Halogenoalkanes Alkenes	Ethanol production Oxidation of alcohols Tests for functional groups Analytical techniques	
Intent						
How does this link to your intent?	A revision from GCSE about the idea of the atom and evidence of subatomic particles. The student extends their knowledge with the introduction of the mass spectrometer and evidence for the arrangement of electrons. Students gain an opportunity to incorporate maths skills into experiments.	This topic revisits the three main types of bonds studied at GCSE. This is extended by how various types of forces are responsible for different states of matter and how electrons contribute to the shape of molecules and ions.	This topic looks further at the periodic table and its trends with a focus on group 2 and 7 elements. Students will be introduced to organic chemistry and the principals of the special naming system	This topic builds on the knowledge of alkanes and alkenes studied at GCSE. It goes into more detail of how alkanes can be cracked to produce more useful molecules and deals with the combustion of carbon.	This topic builds on polymerisation studied at GCSE and considers the different properties of polymers and recycling.	

			of organic compounds.			
Sequencing						
Why this and why now?	This will form the foundation for students to go to A level.	This will form the foundation for students to go to A level	This will form the foundation for students to go to A level	This will form the foundation for students to go to A level	This will form the foundation for students to go to A level	This will form the foundation for students to go to A level
Key concepts / Vocabulary						
12 or less	• Mass • Charge • Electrostatic forces • isotopes • Carbon dating • Mass spectra • Quantum mechanics • Atomic orbitals		• Relative atomic mass • Avogadro • Ideal gas equation • Formulae • Moles • Atom economy • Yield • titration	• Alkane • Alkene • Cracking • Combustion • Nucleophile • Electrophile • Elimination • Substitution	• Polymer	
Description	Use of Seneca Use of workbook Past exam questions.		Use of Seneca Use of workbook Past exam questions.	Use of Seneca Use of workbook Past exam questions.	Use of Seneca Use of workbook Past exam questions.	Use of Seneca Use of workbook Past exam questions.

	Preparing presentations on topics and creating revision resources. Reading and Research		Preparing presentations on topics and creating revision resources. Reading and Research	Preparing presentations on topics and creating revision resources. Reading and Research	Preparing presentations on topics and creating revision resources. Reading and Research	Preparing presentations on topics and creating revision resources. Reading and Research
Assessment						
Type	Formative assessment in lessons with prior knowledge challenged. Summative end of topic test. Mock Exams		Formative assessment in lessons with prior knowledge challenged. Summative end of topic test. Mock exams	Formative assessment in lessons with prior knowledge challenged. Summative end of topic test. Mock Exams	Formative assessment in lessons with prior knowledge challenged. Summative end of topic test. Mock Exams	Formative assessment in lessons with prior knowledge challenged. Summative end of topic test. Mock Exams
Why this style of assessment and why now?	Exam skills		Exam skills	Exam skills	Exam skills	Exam skills

Y13

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Exam Board & Specification						
	Term 1		Term 2		Term 3	
	1	2	3	4	5	6
Topic Name Key Content	Thermodynamics Enthalpy definitions Lattice enthalpy Born Harber cycle Enthalpies of solution Entropy Free Energy change Rate Equations Rate experiments The rate determining step The Arrhenius Equation Gas equilibria and Kp	Electrode potentials Electrochemical series Batteries and fuel cells Acids, bases and Kw PH calculations PH curves and indicators Titration calculations Buffer action	Elements and oxides Transition metals Complex ions Formation of coloured ions Substitution reactions Variable oxidation states Titrations and transition metals Catalysts Metal-aqua ions	Optical isomerism Aldehydes and ketones Carboxylic acids and esters Acyl Chlorides Purifying organic compounds Aromatic compounds Amines and amides Condensation polymers Disposing of polymers	Amino acids Proteins and enzymes DNA Organic synthesis NMR Spectroscopy H NMR Chromatography Exam prep	Exam prep
Intent						
How does this link to your intent?	Builds on the ideas introduced in AS Chemistry	Periodicity builds on knowledge from GCSE and Y12. It looks at the	Students learn about the unique chemical properties of the	This knowledge builds on knowledge gained at AS level looking at the		

	and looks at how you can calculate enthalpy changes that are hard or impossible to measure directly. Kinetics is about rates of reactions. Students learn the rate equation using the concentrations of different species in a reaction mixture. Students apply the equilibria law and Le Chatelier's principle to reversible reactions learned in Y12.	properties period 3 elements and some of their compounds to establish patterns.	transition metals. These include coloured complexes, complex formation and catalytic activity along with variable oxidation states.	reactions of organic compounds. It also has strong links with Biology as it explores polymerisation and amino acids, proteins and DNA. It shows how a series of organic reactions can be linked together to make a target molecule from a given starting material. It also uses NMR for structure determination.		
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Sequencing						
Why this and why now?						
Key concepts / Vocabulary						
12 or less	• Enthalpy • Hydration • Entropy • Polarised • Gibbs Free Energy • Kinetic Factors • Rate • Constant • Electrode potentials		• Ionisation • dissociation • Equivalence point • Buffer • Weak acid • Strong acid • Titration • pH	• Isomerism • Polarimeter • Chirality • Aldehydes • Ketones • Carbonyl • Nucleophilic addition • Fehling's test	• Zwitterions • Protonated • Amide linkage • Hydrolysis • Chromatography • Stereospecificity • Monomer • Polymerisation • Cisplatin • NMR	
Description	Use of Seneca Use of workbook Past exam questions.	Use of Seneca Use of workbook Past exam questions. Preparing presentations on topics	Use of Seneca Use of workbook Past exam questions. Preparing presentations on	Use of Seneca Use of workbook Past exam questions.	Use of Seneca Use of workbook Past exam questions.	Use of Seneca Use of workbook Past exam questions.

	Preparing presentations on topics and creating revision resources. Reading and Research.	and creating revision resources. Reading and Research.	topics and creating revision resources. Reading and Research.	Preparing presentations on topics and creating revision resources. Reading and Research.	Preparing presentations on topics and creating revision resources. Reading and Research.	Preparing presentations on topics and creating revision resources. Reading and Research.
Assessment						
Type	Formative assessment in lessons with prior knowledge challenged. Summative end of topic test. Mock Exams	Formative assessment in lessons with prior knowledge challenged. Summative end of topic test. Mock Exams	Formative assessment in lessons with prior knowledge challenged. Summative end of topic test. Mock Exams	Formative assessment in lessons with prior knowledge challenged. Summative end of topic test. Mock Exams	Formative assessment in lessons with prior knowledge challenged. Summative end of topic test. Mock Exams	Formative assessment in lessons with prior knowledge challenged. Summative end of topic test. Mock Exams
Why this style of assessment and why now?	Exam skills	Exam skills	Exam skills	Exam skills	Exam skills	Exam skills