



Curriculum Map for Triple Science Chemistry Year 10

YEAR 10	Autumn 1	Autumn 2
Topics	Structure & Bonding Energy Changes	Chemical Analysis The Earth's Resources Using The Earth's Resources
Substantive Knowledge – The Knowledge and Content Taught By The Teacher	<ul style="list-style-type: none">Students will learn about the different types of bonding in Chemistry - namely ionic, covalent and metallic.They will do experiments around testing for different types of gases before moving onto the energy changes topic.Students learn about reactions that give off heat (exothermic) and take in heat (endothermic) through lots of practical work.They will complete reaction profiles for these situations.	<ul style="list-style-type: none">Students will learn about analytical techniques in Chemistry such as chromatography and its uses in industry and crime solving.Students will learn about the Earth's resources and how we can make water safe to drink around the world.Following on from this, students will learn about other materials such as alloys, polymers and transition metals and how we can use them sustainably to our advantage.
Disciplinary Knowledge – The Knowledge Scientists Need So They Can Collect, Understand and Evaluate Scientific Evidence	<ul style="list-style-type: none">The history and discovery of the states of matter and bonding.Exothermic and endothermic reactions in everyday life and discoveries that have changed the way we live (sports, emergency search and rescue).	<ul style="list-style-type: none">History of alloys (Bronze Age etc).Analysing chromatograms in forensics and how we use it to solve crime.History of polymers and their development.
Skills	<ul style="list-style-type: none">Visualising and representing 2D and 3D forms including two dimensional representations of 3D objects.Recognising, drawing and interpreting diagrams.Translating from data to a representation with a model.Using models in explanations, or matching features of a model to the data from experiments or observations that the model describes or explains.Making predictions or calculating quantities based on the model or show its limitations.Giving examples of ways in which, a model can be tested by observation or experiment.	<ul style="list-style-type: none">Students should be able to identify formulations given appropriate information.Investigating the conditions for rusting.

Links To Prior Learning	<ul style="list-style-type: none"> States of Matter Covered at Primary School and Year 7 Endothermic and Exothermic Reactions Mentioned at Year 8 	<ul style="list-style-type: none"> Chromatography Introduced at Year 7 Induction Introduced in Year 7
Literacy/ Numeracy	<ul style="list-style-type: none"> Numeracy - reaction profile drawing and interpretation, bond energy calculations. 	<ul style="list-style-type: none"> Numeracy - analysing chromatograms. Recognising and use expressions in decimal form. Using ratios, fractions and percentages. Making estimates of the results of simple calculations. Literacy - focus on risk assessment structure.
Cross Curricular	<ul style="list-style-type: none"> Geography - Salts PE - Endothermic and Exothermic Reactions Art - Graphite 	<ul style="list-style-type: none"> Art - Glass and Ceramics Technology - Polymers Forensics - Chromatography
Assessment	<ul style="list-style-type: none"> Bonding and Gas Tests Assessment Energy Changes Assessment 	<ul style="list-style-type: none"> Metals and Analysis Assessment

YEAR 10	Spring 1	Spring 2
Topics	<p>Structure & Bonding</p> <p>Chemical Calculations</p>	Chemical Changes
Substantive Knowledge – The Knowledge and Content Taught By The Teacher	<ul style="list-style-type: none"> Students will take the knowledge from bonding last term and follow on to look at new technology linking into this. Students will learn about nanoparticles and their applications in Science, as well as the structure and function of materials such as diamond and graphite. Students will learn about chemical calculations, linking the topics covered in Year 9 on atomic structure to calculating relative masses, moles and atom economy. Students will get to complete titrations here and do the subsequent calculations from them. 	<ul style="list-style-type: none"> Students will learn about the reactivity series using the periodic table and how it can affect chemical reactions. They will learn how we can get salts from metals and insoluble bases and how we can neutralise substances using knowledge of acids and alkalis. They will also complete practicals where we make different salts.
Disciplinary Knowledge – The Knowledge Scientists Need So They Can Collect, Understand and Evaluate Scientific Evidence	<ul style="list-style-type: none"> Development of nanoparticles and their uses over time. 	<ul style="list-style-type: none"> Development of the reactivity series and proof of where metals lie in the reactivity series. Uses of neutralisation and making salts.

Skills	<ul style="list-style-type: none"> Recognising substances as small molecules, polymers or giant structures from diagrams showing their bonding. Visualising and representing 2D and 3D forms including two dimensional representations of 3D objects. 	<ul style="list-style-type: none"> Offering an opportunity within displacement reactions of halogens. Investigating pH changes when a strong acid neutralises a strong alkali. Measuring the pH of different acids at different concentrations.
Links To Prior Learning	<ul style="list-style-type: none"> Atom Economy Introduced in Years 7 and 8 Atomic Structure in Year 9 	<ul style="list-style-type: none"> Neutralisation and Acids and Alkalis Introduced at Year 7
Literacy/ Numeracy	<ul style="list-style-type: none"> Numeracy Equations and Calculations From Masses to Balanced Equations Yield of a Chemical Reaction Expressing Concentrations Titration Calculations Volumes of Gases Recognising and Using Expressions in Decimal Form Use Ratios, Fractions and Percentages Use an Appropriate Number of Significant Figures Change the Subject of an Equation 	<ul style="list-style-type: none"> Numeracy - Graph Interpretation and Analysis Literacy - Development of Ethic-Based Reasoning
Cross Curricular		<ul style="list-style-type: none"> Geography - Mining and Natural Resources
Assessment	<ul style="list-style-type: none"> Quantitative Chemistry Assessment 	<ul style="list-style-type: none"> Metal and Salts Assessment

YEAR 10	Summer 1	Summer 2
Topics	<p>Electrolysis</p> <p>Energy Changes</p>	Chemical Analysis
Substantive Knowledge – The Knowledge and Content Taught By The Teacher	<ul style="list-style-type: none"> Students will learn about the process of splitting substances using electricity known as electrolysis. We look at how this can be used in industry and how it can save the planet by reducing the need to mine new materials. Students will investigate chemical cells and fuel cells and how these could be used in the future with car technology. 	<ul style="list-style-type: none"> Students will learn about chemical analysis and how to test for different ions in solutions.
Disciplinary Knowledge – The Knowledge Scientists Need So They Can Collect, Understand and Evaluate Scientific Evidence	<ul style="list-style-type: none"> History and development of electrolysis. Development of chemical cells and batteries - future of driving and fuels. 	<ul style="list-style-type: none"> History of instrumental methods to judge ions.

Skills	<ul style="list-style-type: none"> • A safer alternative for practical work is anhydrous zinc chloride. • Safe and careful use of liquids. 	<ul style="list-style-type: none"> • Mixing of reagents to explore chemical changes and/or products.
Links To Prior Learning	<ul style="list-style-type: none"> • Ions covered in Year 9 • Current covered in Electromagnets Year 7 	<ul style="list-style-type: none"> • Charge covered in Year 7 • Electrolysis covered Year 10 • Solubility covered in Years 7 and 8 • Transition Metals and Gas Tests covered in Year 10
Literacy/ Numeracy	<ul style="list-style-type: none"> • Numeracy - Balancing Equations, Ionic Equations and Calculating Charge 	<ul style="list-style-type: none"> • Numeracy - 2+ and 1+ ions and Transition Metals with Graphical Interpretation
Cross Curricular	<ul style="list-style-type: none"> • Geography - Mining of Lithium • History - War for Resources • Geography - Clean Air Clean Fuels • PSCE - Social Responsibilities • Technology - Resistant Materials 	<ul style="list-style-type: none"> • Criminology/Forensic Science - Chromatography • Art/Photography - Colours of Ions
Assessment	<ul style="list-style-type: none"> • Electrolysis Assessment 	<ul style="list-style-type: none"> • Ions and Atmosphere Assessment