



Curriculum Map for Triple Science Chemistry Year 11

YEAR 11	Autumn 1	Autumn 2
Topics	Chemical Analysis Using Our Resources	Crude Oil & Fuels Organic Reactions
Substantive Knowledge – The Knowledge and Content Taught By The Teacher	<ul style="list-style-type: none">Students will learn how we can use the Earth's resources sustainably.They will learn about the Haber process (making ammonia) and the conditions needed for this.They will learn how fertilisers are made for industry and the ingredients required for this.	<ul style="list-style-type: none">Students will learn about the uses of crude oil in industry and how it impacts our day-to-day life.In organic reactions students will learn about the different components of organic chemistry, the structures and properties of these, and how they are used in everyday life.
Disciplinary Knowledge – The Knowledge Scientists Need So They Can Collect, Understand and Evaluate Scientific Evidence	<ul style="list-style-type: none">History of the Haber process and its development.Development of fertilisers over time.	<ul style="list-style-type: none">The history of crude oil and its discovery over time, its uses and alternatives.Uses of alcohols, carboxylic acids and esters in industry.
Skills	<ul style="list-style-type: none">Recognising the importance of scientific quantities and understand how they are determined.Using SI units (e.g., kg, g, mg; km, m, mm; kJ, J) and IUPAC chemical nomenclature unless inappropriate.	<ul style="list-style-type: none">Making models of alkane molecules using the molecular modelling kits.Investigating the properties of different hydrocarbons.Recognising substances that are alkenes from their names or from given formulae in these forms.Visualising and representing 2D and 3D forms including two dimensional representations of 3D objects.Opportunities when investigating reactions of alcohols.Opportunities within investigation of the reactions of carboxylic acids.Using SI units (e.g., kg, g, mg; km, m, mm; kJ, J) and IUPAC chemical nomenclature unless inappropriate.
Links To Prior Learning	<ul style="list-style-type: none">Analysing Chromatography Paper and Calculations covered in Year 8Variables covered through How Science Works Topics in Years 7 and 8	<ul style="list-style-type: none">Fuels covered in Earth Topic in Year 8 but not specifically linked to Hydrocarbons - more the impact they have on the earth and global warming
Literacy/ Numeracy	<ul style="list-style-type: none">Use Scientific Vocabulary, Terminology and Definitions	<ul style="list-style-type: none">Selecting and Using Correct Scientific Terminology

	<ul style="list-style-type: none"> Recognise and Use Expressions in Decimal Form Use Ratios, Fractions and Percentages Change the Subject of an Equation Substitute Numerical Values into Algebraic Equations Using Appropriate Units for Physical Quantities Using Prefixes and Powers of Ten for Orders of Magnitude (e.g., tera, giga, mega, kilo, centi, milli, micro and nano) Using an Appropriate Number of Significant Figures in Calculation 	<ul style="list-style-type: none"> Recognise the Importance of Scientific Quantities and Understand How They Are Determined Using Prefixes and Powers of Ten for Orders of Magnitude (e.g tera, giga, mega, kilo, centi, milli, micro and nano) Using an Appropriate Number of Significant Figures in Calculation
Cross Curricular	<ul style="list-style-type: none"> Criminology - Uses of Chromatography in Crime Investigations Art - Glass and Ceramics Geography - Fertiliser Impacts 	<ul style="list-style-type: none"> PSCHE - Alcohol Uses and Dangers
Assessment	<ul style="list-style-type: none"> Chemical Analysis Assessment Using our Resources Assessment 	<ul style="list-style-type: none"> Crude Oil and Fuels Assessment Organic Reactions Assessment

YEAR 11	Spring 1	Spring 2 Summer 1
Topics	Polymers	Rates & Equilibrium Whole Syllabus Review & Revision
Substantive Knowledge – The Knowledge and Content Taught By The Teacher	<ul style="list-style-type: none"> Students will learn about natural and synthetic (manmade) polymers, and how they are created and used in our everyday lives. This also links into the main natural polymer in our bodies – DNA. 	<ul style="list-style-type: none"> In rates and equilibrium, students will learn how different factors such as temperature, surface area, concentration and catalysts can affect rates of reaction. Students will also learn what happens when a reaction reaches its equilibrium and how it can be reversed and what can happen if we change the conditions within this reversible reaction.
Disciplinary Knowledge – The Knowledge Scientists Need So They Can Collect, Understand and Evaluate Scientific Evidence	<ul style="list-style-type: none"> History of synthetic and natural polymers and development. History of DNA and development in the use of medicine and biochemistry. 	<ul style="list-style-type: none"> Collision theory and its development. Le Chatelier’s Principles.
Skills	<ul style="list-style-type: none"> Using models to represent addition polymerisation. Visualising and representing 2D and 3D forms including two dimensional representations of 3D objects. 	<ul style="list-style-type: none"> An opportunity to investigate the catalytic effect of adding different metal salts to a reaction such as the decomposition of hydrogen peroxide.

Links To Prior Learning	<ul style="list-style-type: none"> Year 8 - Polymers Introduced Year 8 - DNA Structure Introduced but not as a polymer 	<ul style="list-style-type: none"> Year 8 - Catalyst introduced around Biological Enzymes Year 9 - Rates of Reactions when discussing Enzymes and Photosynthesis Year 10 Autumn Term - The Haber Process
Literacy/ Numeracy	<ul style="list-style-type: none"> Choosing the correct scientific literacy and terminology. Calculating the length of polymer chains and using standard form. Understanding the nth term. 	<ul style="list-style-type: none"> Recognising and using expressions in decimal form. Ratios, fractions and percentages. Making estimates of the results of simple calculations. Translating information between graphical and numeric form. Drawing and interpreting appropriate graphs from data to determine rate of reaction. Determining the slope and intercept of a linear graph. Drawing and using the slope of a tangent to a curve as a measure of rate of change.
Cross Curricular	<ul style="list-style-type: none"> Biology- DNA Structure History - Development of Manufacturing, Natural and Synthetic Polymers 	
Assessment	<ul style="list-style-type: none"> Polymers Assessment 	<ul style="list-style-type: none"> Rates and Equilibrium Assessment