

# Long Term Plan: Chemistry Year 12 (Teacher Two)

Half term	Unit title	Key knowledge/ Content to learn and retain	Essential skills to acquire (subject & generic)	Link to subject ethos and driver (rename)	Anticipated misconceptions	Links to previous KS	Opportunity for stretch for high prior attainers	SMSC & British Values	Cultural Capital	Career Link
One	Physical Chemistry - Bonding and Energy	<p>Metallic, Ionic and Covalent bonding, including dative bonds</p> <p>Giant covalent structures</p> <p>Bond angles, shapes of molecules and polarity</p> <p>Forces between molecules</p> <p>Electronegativity</p>	<p>Level three technical and practical skills, including use of advanced glassware to carry out synthesis and purification</p> <p>Accurate measurement of substances using a variety of equipment including titration</p> <p>Safe handling of corrosive and toxic chemicals</p>		<p>Even at KS5 students often confuse the use of the terms "Intermolecular forces" and "Electrostatic forces"</p>	<p>The year 12 course builds directly on from the work done at GCSE.</p> <p>In this unit students will extend their GCSE knowledge on bonding, by considering different types of covalent bonding.</p> <p>Electronegativity and its implications is a new concept for students at this stage</p>	<p>Multi Step calculation problems.</p> <p>Unit conversions within calculations</p> <p>Linking charge to attraction - why do ionic substances have a higher melting point than metals?</p>	<p>The importance of working safely and respecting each other in the lab</p> <p>The importance of disposing of chemical waste in an environmentally friendly and sustainable way.</p>	<p>The ubiquity of chemistry allows examples to be placed in a wide variety of familiar and unfamiliar contexts.</p>	<p>As the central science, chemistry opens doors to a wide range of STEM field careers.</p>

			<p>Presenting and interpreting data in graphical and tabular form</p> <p>Extended writing, including producing formal lab write ups with references and citations</p> <p>Following written methods</p> <p>Mathematical skills, including changing the subject of an equation, multi step problem solving, percentages, graph drawing, drawing tangents to a curve, ratios, using standard form, fractions and working with powers.</p>							
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Two	Physical Chemistry - Bonding and Energy	<p>Enthalpy of formation</p> <p>Enthalpy of combustion</p> <p>Calorimetry</p> <p>Hess' Law and Bond Enthalpy calculations</p>	<p>Level three technical and practical skills, including use of advanced glassware to carry out synthesis and purification</p> <p>Accurate measurement of substances using a variety of equipment including titration</p> <p>Safe handling of corrosive and toxic chemicals</p> <p>Presenting and interpreting data in graphical and tabular form</p> <p>Extended writing, including producing formal lab write ups with references and citations</p> <p>Following</p>		The differences between standard lab-book values and experimental values	<p>The year 12 course builds directly on from the work done at GCSE.</p> <p>In this unit students will extend their GCSE knowledge of energy changes. Most of the ideas studied in this unit were covered in a qualitative sense at GCSE, and are now being returned to for quantitative study.</p>	<p>Multi Step calculation problems.</p> <p>Unit conversions within calculations</p>	<p>The importance of working safely and respecting each other in the lab</p> <p>The importance of disposing of chemical waste in an environmentally friendly and sustainable way.</p>	The ubiquity of chemistry allows examples to be placed in a wide variety of familiar and unfamiliar contexts.	As the central science, chemistry opens doors to a wide range of STEM field careers.
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			<p>written methods</p> <p>Mathematical skills, including changing the subject of an equation, multi step problem solving, percentages, graph drawing, drawing tangents to a curve, ratios, using standard form, fractions and working with powers.</p>							
Three	Organic Chemistry	<p>Hydrocarbons and crude oil processing</p> <p>Free Radical Substitution</p> <p>Halogenoalkanes</p> <p>Nucleophilic Substitution</p> <p>Ozone Depletion</p> <p>Preparation of a halogenoalkane</p>	<p>Level three technical and practical skills, including use of advanced glassware to carry out synthesis and purification</p> <p>Accurate measurement of substances using a variety of equipment including titration</p> <p>Safe handling</p>		<p>Students often confuse mechanisms and so this will need a lot of explicit practice.</p> <p>Naming conventions will also need extensive practice, as this is another area students are often confused.</p>	<p>The year 12 course builds directly on from the work done at GCSE.</p> <p>In this unit students will extend their GCSE knowledge of organic chemistry. For students who have completed separate sciences - often called Triple - a lot of this unit</p>	<p>Multi Step calculation problems.</p> <p>Unit conversions within calculations</p> <p>Multi-step organic synthesis, including mechanisms</p>	<p>The importance of working safely and respecting each other in the lab</p> <p>The importance of disposing of chemical waste in an environmentally friendly and sustainable way. The impact of the use of CFCs and why these have now been banned.</p>	<p>The ubiquity of chemistry allows examples to be placed in a wide variety of familiar and unfamiliar contexts.</p>	<p>As the central science, chemistry opens doors to a wide range of STEM field careers.</p>

			<p>of corrosive and toxic chemicals</p> <p>Presenting and interpreting data in graphical and tabular form</p> <p>Extended writing, including producing formal lab write ups with references and citations</p> <p>Following written methods</p> <p>Mathematical skills, including changing the subject of an equation, multi step problem solving, percentages, graph drawing, drawing tangents to a curve, ratios, using standard form, fractions and working with powers.</p>			<p>will be familiar; as they will have already studied many of the types of molecules covered in this unit. For these students, we begin to build up by looking at different mechanisms of reactions, and chemical analysis.</p> <p>For students who studied combined science at GCSE all but the first two or three lessons of this unit will be new to them.</p>		<p>The implications of damage to the Ozone Layer</p>	
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Four	Organic Chemistry	<p>Elimination reactions</p> <p>Alcohols</p> <p>Oxidation of alcohols</p> <p>Testing for functional groups</p> <p>Using MS and IR to identify compounds</p>	<p>Level three technical and practical skills, including use of advanced glassware to carry out synthesis and purification</p> <p>Accurate measurement of substances using a variety of equipment including titration</p> <p>Safe handling of corrosive and toxic chemicals</p> <p>Presenting and interpreting data in graphical and tabular form</p> <p>Extended writing, including producing formal lab write ups with references and citations</p> <p>Following</p>		<p>Students often confuse mechanisms and so this will need a lot of explicit practice.</p> <p>Naming conventions will also need extensive practice, as this is another area students are often confused.</p>	<p>The year 12 course builds directly on from the work done at GCSE.</p> <p>In this unit students will extend their GCSE knowledge of organic chemistry. For students who have completed separate sciences - often called Triple - a lot of this unit will be familiar; as they will have already studied many of the types of molecules covered in this unit. For these students, we begin to build up by looking at different mechanisms of reactions, and chemical analysis.</p> <p>For students who studied combined</p>	<p>Multi Step calculation problems.</p> <p>Unit conversions within calculations</p> <p>Multi-step organic synthesis, including mechanisms</p>	<p>The importance of working safely and respecting each other in the lab</p> <p>The importance of disposing of chemical waste in an environmentally friendly and sustainable way. The impact of the use of CFCs and why these have now been banned.</p> <p>The implications of damage to the Ozone Layer</p>	<p>The ubiquity of chemistry allows examples to be placed in a wide variety of familiar and unfamiliar contexts.</p>	<p>As the central science, chemistry opens doors to a wide range of STEM field careers.</p>
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			<p>written methods</p> <p>Mathematical skills, including changing the subject of an equation, multi step problem solving, percentages, graph drawing, drawing tangents to a curve, ratios, using standard form, fractions and working with powers.</p>			<p>science at GCSE all but the first two or three lessons of this unit will be new to them.</p>				
Five	Revision of content covered in preparation for AS Exams									
Six	Revision of content covered, and sitting of AS Exams									