

# Chemistry Curriculum Overview – Year 11

Sequencing of topics	What knowledge will students develop? (Including key terminology)	What skills will students develop? (Including literacy & numeracy)	Assessment opportunities	Homework opportunities	Personal development (Ursuline Values, Catholic Social Teaching, Cultural Capital, Cross-curricular, Careers)	Curriculum links
<p><b>Chemical Analysis</b></p> <p>Purity, formulations and chromatography</p>	<ul style="list-style-type: none"> <li>Define the terms: pure substance and compound.</li> <li>Explain, in terms of intermolecular forces, the terms: melting point and boiling point.</li> <li>Use data to identify pure and impure substances</li> <li>Chromatography</li> <li>Explain how paper chromatography separates mixtures.</li> <li>Suggest how chromatographic methods can be used for distinguishing pure substances from impure substances.</li> </ul>	<ul style="list-style-type: none"> <li>Drawing results table</li> <li>Plotting graphs</li> <li>Analysing results</li> <li>Interpreting data</li> <li>Define the terms: mixture and formulation</li> <li>Identify the purpose of a component in a formulation</li> <li>Be able to use melting point data to distinguish pure from impure substances</li> <li>Describe a method for paper chromatography</li> <li>Explain how paper chromatography separates mixtures.</li> <li>Calculate R<sub>f</sub> values and use it to identify substances</li> </ul>	<ul style="list-style-type: none"> <li>AFL in lessons and homework</li> <li>Mid Topic assessment QWC</li> <li>End of topic test-summative assessment</li> </ul>	<ul style="list-style-type: none"> <li>Differentiated worksheets</li> <li>Flipped Learning</li> <li>Exam style questions</li> <li>Neeto/satchel quizzes</li> <li>Research Task</li> <li>YouTube videos with questions</li> <li>SAM learning</li> <li>Practical write up</li> </ul>	<ul style="list-style-type: none"> <li><b>United in harmony</b> when we consider the wider uses of materials and medicine</li> <li><b>Grateful</b> for the beauty of the different types of atoms</li> <li><b>Faith-filled and hopeful</b> when seeing beyond the naked eye</li> <li><b>Discerning and joyful</b> at the possibilities of science and medicine</li> <li><b>Leading others in pursuit of justice</b> when planning and carrying out a practical</li> <li><b>Service and sacrifice</b> when we recognise the scientific work that has been done before us</li> </ul>	<p>KS4/5</p> <ul style="list-style-type: none"> <li>Yr 9 &amp; 12</li> <li>Bonding</li> </ul> <p>KS3</p> <ul style="list-style-type: none"> <li>Yr 7</li> <li>Mixtures</li> </ul> <p>KS3 &amp; 5</p> <ul style="list-style-type: none"> <li>Yr 7 &amp; 13</li> <li>Chromatography</li> </ul> <p>KS3</p> <ul style="list-style-type: none"> <li>Yr 7</li> <li>Test for H<sub>2</sub></li> </ul> <p>KS5</p> <ul style="list-style-type: none"> <li>Yr 12</li> <li>Tests for anions and cations</li> <li>Test for CO<sub>2</sub></li> <li>Test for Cl<sub>2</sub></li> <li>Group 2 ions</li> </ul> <p>KS4</p> <ul style="list-style-type: none"> <li>Yr 9 Covalent bonding</li> <li>Trends in physical and chemical properties</li> </ul>

	<ul style="list-style-type: none"> <li>○ Interpret chromatograms and determine <math>R_f</math> values from chromatograms.</li> <li>○ Provide answers to an appropriate number of significant figures.</li> <li>○ Identification of gases</li> <li>○ Making and testing for Chlorine</li> <li>○ Flame tests</li> <li>○ Identification of some cations using sodium hydroxide solution</li> </ul>	<ul style="list-style-type: none"> <li>○ Conversion of units</li> <li>○ Rearranging equation</li> <li>○ Describe how to make and test for <math>H_2</math>, <math>O_2</math>, <math>CO_2</math></li> <li>○ Describe how to make and test for <math>Cl_2</math></li> <li>○ Describe how to carry out a flame test</li> <li>○ Identify cations from flame tests</li> <li>○ To describe other tests to identify Ca, Mg, Cu, Fe, Fe</li> <li>○ Know the colours of the precipitates formed by reaction with sodium hydroxide</li> <li>○ Be able to write balanced equations for the reactions to produce the insoluble hydroxides</li> <li>○ To use sodium hydroxide to identify</li> </ul>			<ul style="list-style-type: none"> <li>○ <b>Dignity of the human person</b></li> <li>○ when considering healthcare</li> <li>○ <b>Courageous and resilient</b> when we consider how the atom and periodic table were developed</li> <li>○ <b>United in harmony</b> when we consider the wider uses of materials such as polymers, nanoparticles and medicine</li> <li>○ <b>Grateful</b> for the abundance of the Earth's resources</li> <li>○ <b>Faith-filled and hopeful</b> when seeing beyond the naked eye</li> <li>○ <b>Discerning and joyful</b> at the possibilities of science and medicine</li> <li>○ <b>Leading others in pursuit of justice</b> when discussing how individuals can do their bit to make our environment cleaner.</li> <li>○ <b>Service and sacrifice</b> when we recognise the scientific work that has been done before us</li> </ul>	
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	<ul style="list-style-type: none"> <li>○ Tests for Anions- carbonate and sulfate</li>   <li>○ Instrumental methods</li> </ul>	<p>Ca<sup>2+</sup>, Mg<sup>2+</sup>, Cu<sup>2+</sup>, Fe<sup>2+</sup>, Fe<sup>3+</sup> ions</p> <ul style="list-style-type: none"> <li>○ Describe how dilute acids can be used to identify carbonates</li> <li>○ Describe how barium chloride can be used to identify sulfate ions</li> <li>○ <b>Required Practical: Identification of an unknown compound</b></li> <li>○ Use chemical tests to identify the ions in unknown single ionic compounds</li>   <li>○ Research instrumental methods for detecting elements and compounds.</li> <li>○ Compare these to chemical tests carried out in previous lessons.</li> <li>○ State advantages of instrumental methods compared with the chemical tests</li> </ul>			<ul style="list-style-type: none"> <li>○ <b>Dignity of the human person</b> when considering healthcare</li>   <li>○ <b>Courageous and resilient</b> when we consider how new medicine is discovered and trialled</li>   <li>○ <b>Loving and compassionate</b> when we consider the effect of pollution from combustion on human health</li> </ul>	
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	<ul style="list-style-type: none"> <li>○ Flame emission spectroscopy</li> </ul>	<ul style="list-style-type: none"> <li>○ Describe the process of flame emission spectroscopy.</li> <li>○ Explain what happens to a sample throughout the process of flame emission.</li> <li>○ Interpret instrumental results for flame emission spectroscopy.</li> <li>○ Calculation and interpretation of Rf values</li> <li>○ Recognise and use expressions in decimal form. Make estimates of the results of simple calculations</li> <li>○ Use an appropriate number of significant figures.</li> <li>○ Balancing equations</li> <li>○ Translate information between graphical and numeric form</li> </ul>	<ul style="list-style-type: none"> <li>○ AFL in lessons and homework</li> <li>○ Mid Topic assessment QWC</li> <li>○ End of topic test-summative assessment</li> </ul>			<p>KS4</p> <ul style="list-style-type: none"> <li>○ Yr 11 Flame tests</li> </ul> <p>KS5</p> <ul style="list-style-type: none"> <li>○ Yr 12 Instrumental analysis</li> </ul>
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<p><b>Organic Chemistry</b></p> <p>Alkanes</p>	<ul style="list-style-type: none"> <li>○ Crude oil, hydrocarbons and alkanes</li> </ul>	<ul style="list-style-type: none"> <li>○ Describe how Crude oil was made</li> <li>○ Describe the composition of crude oil</li> <li>○ Draw covalent bonding in the first four members of the alkane series</li> <li>○ Visualise and represent 2D and 3D forms including two dimensional representations of 3D objects.</li> <li>○ Name and recognise the first four members of the alkanes series</li> <li>○ Make models of alkane molecules using molecular modelling kit</li> <li>○ Use a variety of models such as representational, spatial, descriptive, computational and mathematical to solve problems, make predictions and to develop scientific explanations and understanding</li> <li>○ Use scientific vocabulary, terminology and definitions.</li> </ul>		<ul style="list-style-type: none"> <li>○ Differentiated worksheets</li> <li>○ Flipped Learning</li> <li>○ Exam style questions</li> <li>○ Neeto/satchel quizzes</li> <li>○ Research Task</li> <li>○ YouTube videos with questions</li> <li>○ SAM learning</li> <li>○ Practical write up</li> </ul>	<ul style="list-style-type: none"> <li>○ <b>United in harmony</b></li> <li>○ <b>Grateful</b> for medicine/vaccination</li> <li>○ <b>Faith-filled and hopeful</b> when seeing beyond the naked eye and the advancements of medicine</li> <li>○ <b>Discerning and joyful</b></li> <li>○ When we consider the choices we make when we use fuels</li> <li>○ And joyful at research into new and alternative fuels with minimal effect on our environment</li> <li>○ <b>Leading others in pursuit of justice</b> when planning and carrying out a practical</li> <li>○ <b>Service and sacrifice</b> when we recognise the scientific work that has been done before us</li> <li>○ <b>Dignity of the human person</b> when considering healthcare</li> <li>○ <b>Courageous and resilient</b> when we consider how vaccines were developed and new drugs are trialed</li> </ul>	<p>KS1 /2</p> <ul style="list-style-type: none"> <li>○ Matter</li> </ul> <p>KS4</p> <ul style="list-style-type: none"> <li>○ Yr 9</li> <li>○ Bonding</li> <li>○ Bonding and property</li> <li>○ Yr 11</li> <li>○ Organic II</li> <li>○ Alkenes, alcohols, carboxylic acids</li> <li>○ Earth and Atmosphere</li> </ul> <p>KS5</p> <ul style="list-style-type: none"> <li>○ Organic Topics</li> <li>○ Yr 12 Alkanes, alkenes, alcohols</li> <li>○ Yr 13 Aldehydes and ketones</li> <li>○ Carboxylic acid and derivatives</li> <li>○ Amino acid,</li> <li>○ proteins and DNA</li> </ul>
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	<ul style="list-style-type: none"> <li>○ Fractional distillation and petrochemicals</li> <li>○ Properties of hydrocarbons</li> <li>○ Combustion of hydrocarbons</li> <li>○ Cracking</li> <li>○ Alkenes</li> </ul>	<ul style="list-style-type: none"> <li>○ Explain how fractional distillation works in terms of evaporation and condensation</li> <li>○ Plot boiling points of alkanes against number of carbons. Make predictions of the boiling points of other alkanes.</li> <li>○ Explain the properties of hydrocarbons in relation to intermolecular forces.</li> <li>○ Write balanced equations for the complete combustion of hydrocarbons with a given formula.</li> <li>○ Describe in general terms the conditions used for catalytic cracking and steam cracking.</li> <li>○ Test for unsaturation using bromine water</li> </ul>			<ul style="list-style-type: none"> <li>○ <b>Loving and compassionate</b> when we think about those who have suffered serious illness</li> <li>○ <b>Dignity of God's people</b></li> <li>○ <b>Community and participation</b></li> <li>○ <b>Dignity in work</b></li> <li>○ <b>Solidarity</b></li> <li>○ <b>Personal</b></li> <li>○ <b>Cultural</b></li> <li>○ <b>Social</b></li> <li>○ <b>Art</b></li> <li>○ <b>History</b></li> <li>○ <b>Geography</b></li> <li>○ <b>PE</b></li> <li>○ <b>Maths</b></li> <li>○ <b>Doctor</b></li> <li>○ <b>Nurse</b></li> <li>○ <b>Veterinary science</b></li> <li>○ <b>Midwife</b></li> <li>○ <b>Biomedical scientist</b></li> <li>○ <b>Research</b></li> <li>○ <b>Epidemiologist</b></li> </ul>	
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	<ul style="list-style-type: none"> <li>○ Structure and formulae of alkenes (Triple)</li>   <li>○ Reactions of alkenes(Triple)</li> </ul>	<ul style="list-style-type: none"> <li>○ Visualise and represent 2D and 3D forms including two dimensional representations of 3D objects.</li> <li>○ Balance chemical equations as examples of cracking given the formulae of the reactants and products</li> <li>○ Write balanced symbol equations for the combustion of alkenes in oxygen for complete and incomplete combustion</li> <li>○ Describe the balanced symbol equation including moles present, reactants and products.</li> <li>○ Draw fully displayed structural formulae of the first four members of the alkenes and the products of their addition reactions with hydrogen, water, chlorine, bromine and iodine.</li> <li>○ Write the reaction between an alkene and hydrogen,</li> </ul>				
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water, chlorine,  
bromine and iodine

- Describe the test for alkenes and the positive result
- Describe the reaction including moles present, reactants and products
- Define the term saturated – explain with addition product



Alcohols						
Alcohols	<ul style="list-style-type: none"> <li>○ Functional group</li> <li>○ Naming of the first four members</li> <li>○ Reactions of alcohols</li> <li>○ Preparation of ethanol</li> </ul>	<ul style="list-style-type: none"> <li>○ Define functional group and know the functional group for alcohols is -OH</li> <li>○ Draw the displayed formulae and structural formulae of the first four members of the alcohol series</li> <li>○ Name the first four alcohols</li> <li>○ Describe what happens when alcohols are added to water Recall uses of alcohols</li> <li>○ Describe what happens when an alcohol reacts with sodium metal</li> <li>○ Describe what happens when alcohols burn in air</li> <li>○ Write balanced equations to represent complete and incomplete reaction</li> <li>○ Write equations to show how alcohols react with oxidising agents such as potassium manganate</li> </ul>	<ul style="list-style-type: none"> <li>○ AFL activities</li> <li>○ Mid-topic assessment</li> <li>○ End of topic assessment</li> </ul>	<ul style="list-style-type: none"> <li>○ Differentiated worksheets</li> <li>○ Flipped Learning</li> <li>○ Exam style questions</li> <li>○ Neeto/satchel quizzes</li> <li>○ Research Task</li> <li>○ SAM learning</li> <li>○ Practical write up</li> <li>○ YouTube videos with questions</li> </ul>	<ul style="list-style-type: none"> <li>○ <b>United in harmony</b> when we consider the value of different types of atoms</li> <li>○ <b>Grateful</b> for the beauty in an atom and how it can be made into new materials</li> <li>○ <b>Faith-filled and hopeful</b> when seeing beyond the naked eye</li> <li>○ <b>Discerning and joyful</b> at the uses of alcohol</li> <li>○ <b>Leading others in pursuit of justice</b> when planning and carrying out a practical</li> <li>○ <b>Service and sacrifice</b> when we recognise the scientific work that has been done before us</li> <li>○ <b>Care for creation</b></li> <li>○ <b>Community and participation</b></li> <li>○ <b>Dignity of God's people</b></li> <li>○ <b>Solidarity</b></li> <li>○ <b>Personal</b></li> <li>○ <b>Social</b></li> <li>○ <b>Physical</b></li> <li>○ <b>Moral</b></li> </ul>	<p>KS1 /2</p> <ul style="list-style-type: none"> <li>○ Matter</li> </ul> <p>KS4</p> <ul style="list-style-type: none"> <li>○ Yr 9</li> <li>○ Bonding</li> <li>○ Bonding and property</li> <li>○ Yr 11</li> <li>○ Organic II</li> <li>○ Alkenes, alcohols, carboxylic acids</li> </ul> <p>KS5</p> <ul style="list-style-type: none"> <li>○ Organic Topics</li> <li>○ Yr 12 Alkanes, alkenes, alcohols</li> <li>○ Yr 13 Aldehydes and ketones</li> <li>○ Carboxylic acid and derivatives</li> <li>○ Amino acid, proteins and DNA</li> </ul>

- Know that alcohols can be made by fermentation of sugar
- Describe the conditions used for fermentation of sugar using yeast

- Cultural
- Art
- Geography
- PE
- Food Tech
- Maths
- Botanist
- Ecologist
- Environmental scientist
- Biologist
- Research Chemist

<p><b>Carboxylic Acids</b></p>	<p>Carboxylic Acids</p> <ul style="list-style-type: none"> <li>- Structure and properties</li>   <li>- Reactions of Carboxylic Acids</li> </ul>	<ul style="list-style-type: none"> <li>○ Identify the functional group in carboxylic acid</li> <li>○ Draw the displayed and structural formulae of the first four members of the series</li>   <li>○ Name the first four members</li> <li>○ Explain why carboxylic acids are weak acids(HT)</li> <li>○ Find the uses of first four carboxylic acids (HW)</li> <li>○ Grade 9. Draw covalent bonding in carboxylic acids</li>   <li>○ Describe what happens when any of the first four members:</li> <li>○ dissolve in water</li> <li>○ React with a carbonate</li> <li>○ react with alcohol – in particular ethanol with ethanoic acid and</li> <li>○ know the name of the ester formed</li> <li>○ Define the terms: monomer, polymer,</li> </ul>				
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Amino Acids

- Describe the polymerisation of ethane-1,2-diol and hexanedioic acid
- Research common polyesters and their uses.
- Identify functional groups in amino acids
- Write equations to show how amino acids polymerises to form peptides
- Describe the polymerisation of amino acids to produce polypeptides
- Show how different amino acids can be combined in the same chain to produce proteins
- Research uses of different polypeptides
- Research common amino acids and polypeptides, and polypeptide uses.

DNA

- Name the types of monomers from which these natural polymers are made
- Describe the structure of DNA in terms of two polymer chains and nucleotides
- Research naturally occurring polymers and their uses
- Research the history of the discovery of DNA as a polymer chain.

<p><b>Using Resources</b></p>	<ul style="list-style-type: none"> <li>○ Using the Earth's resources and sustainable development</li> <li>○ Obtaining potable water</li> </ul>	<ul style="list-style-type: none"> <li>○ Define the terms: finite and renewable</li> <li>○ Explain the difference between the two terms using suitable examples</li> <li>○ Extract and interpret information about resources from charts , graphs and tables</li> <li>○ Use orders of magnitude to evaluate the significance of data.</li> <li>○ Distinguish between potable water and pure water.</li> <li>○ Describe the differences in treatment of ground water and salty water.</li> <li>○ Give reasons for the steps used to produce potable water.</li> <li>○ Define potable and pure water</li> <li>○ Describe the process of desalination, distillation</li> <li>○ Describe how potable water is sterilised</li> </ul>	<ul style="list-style-type: none"> <li>○ AFL in lessons and homework</li> <li>○ Mid Topic assessment QWC</li> <li>○ End of topic test-summative assessment</li> </ul>	<ul style="list-style-type: none"> <li>○ Differentiated worksheets</li> <li>○ Flipped Learning</li> <li>○ Exam style questions</li> <li>○ Neeto/satchel quizzes</li> <li>○ Research Task</li> <li>○ YouTube videos with questions</li> <li>○ SAM learning</li> <li>○ Practical write up</li> </ul>	<ul style="list-style-type: none"> <li>○ <b>United in harmony</b> when we consider the value of different types of atoms</li> <li>○ <b>Grateful</b> for the beauty in an atom and how it can be made into new materials</li> <li>○ <b>Faith-filled and hopeful</b> when seeing beyond the naked eye</li> <li>○ <b>Discerning and joyful</b> at the possibilities of science and medicine</li> <li>○ <b>Leading others in pursuit of justice</b> when planning and carrying out a practical</li> <li>○ <b>Service and sacrifice</b> when we recognise the scientific work that has been done before us</li> <li>○ <b>Dignity of the human person</b> when considering healthcare</li> <li>○ <b>Loving and compassionate</b> when we consider</li> </ul>	<p>KS1/2</p> <ul style="list-style-type: none"> <li>○ Matter</li> </ul> <p>KS3</p> <ul style="list-style-type: none"> <li>○ Changes of state</li> <li>○ Separating of mixtures</li> </ul>

	<ul style="list-style-type: none"> <li>○ Agriculture and sewage waste</li> </ul>	<ul style="list-style-type: none"> <li>○ <b>RP. Analysis and purification of water samples from different sources including pH, dissolved solids and distillation</b></li> <li>○ Identify species that may be present in sewage and agric waste</li> <li>○ Describe how sewage is treated</li> <li>○ Comment on the relative ease of obtaining potable water from waste, ground and salt water.</li> <li>○ Comment on the relative ease of obtaining potable water from waste, ground and salt water.</li> <li>○ Research how water is treated.</li> <li>○ Extended writing: detail the methods involved</li> </ul>			<p>how scientific advancements can be used to help others</p> <ul style="list-style-type: none"> <li>○ <b>Care of God's creation</b></li> <li>○ <b>Dignity of God's people</b></li> <li>○ <b>Community and participation</b></li> <li>○ <b>Care for creation</b></li> <li>○ <b>Dignity in work</b></li> <li>○ <b>Peace and reconciliation</b></li> <li>○ <b>Solidarity</b></li> <li>○ <b>Personal</b></li> <li>○ <b>Social</b></li> <li>○ <b>Moral</b></li> <li>○ <b>Cultural</b></li> <li>○ <b>Art</b></li> <li>○ <b>DT</b></li> <li>○ <b>PE</b></li> <li>○ <b>Maths</b></li> <li>○ <b>Geography</b></li> <li>○ <b>History</b></li> <li>○ <b>Biologist</b></li> <li>○ <b>Biomedical scientist</b></li> <li>○ <b>Chemical Engineer</b></li> <li>○ <b>Environmental Chemist</b></li> <li>○ <b>Neurologist</b></li> <li>○ <b>Ophthalmologist</b></li> <li>○ <b>Doctor</b></li> <li>○ <b>Nurse</b></li> <li>○ <b>Occupational therapist</b></li> <li>○ <b>Physiotherapist</b></li> <li>○ <b>Research</b></li> </ul>	
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	<ul style="list-style-type: none"> <li>○ Reducing the use of resources</li>   <li>○ Corrosion</li>   <li>○ Prevention of corrosion</li> </ul>	<ul style="list-style-type: none"> <li>○ Identify the limited raw resources used in making glass, metal, building materials and clay</li> <li>○ Describe the environmental impact of obtaining the raw materials from the Earth</li> <li>○ Identify the products that can be reused and those that can only be recycled and describe how they are recycled.</li>   <li>○ Define the following terms using suitable examples: Corrosion, rusting, sacrificial protection</li> <li>○ Describe experiments and interpret results to show that air and water are necessary for rusting.</li>   <li>○ Explain sacrificial protection in terms of relative reactivity</li> <li>○ Describe how to prevent corrosion – using barriers and the role sacrificial barrier</li> </ul>				
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	<ul style="list-style-type: none"><li>○ Alloys</li> <li>○ Ceramics, polymers and composites</li></ul>	<ul style="list-style-type: none"><li>○ Define an alloy, high carbon steel, low carbon steel</li><li>○ Recall the uses of brass, bronze and gold</li><li>○ Using diagrams describe the difference between metals and their alloys</li><li>○ Describe the composition of different types of steel and their uses</li> <li>○ Describe how the following are produced and give uses for each of the following: soda-lime glass, borosilicate glass, clay ceramics, low-density poly(ethene), high density poly(ethene) and composites.</li><li>○ Compare quantitatively the physical properties of glass and clay, ceramics, polymers, composites and metals.</li></ul>				
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	<ul style="list-style-type: none"><li>○ Properties and uses of polymers</li><li>○ The Haber Process</li><li>○ The effect of changing conditions on the yield of ammonia</li></ul>	<ul style="list-style-type: none"><li>○ Use diagrams to describe the structure of thermosoftening and thermosetting polymers</li><li>○ Explain why thermosoftening polymers melt but thermosetting do not.</li><li>○ Explain how their properties are related to their uses.</li><li>○ State where the raw materials in the Haber process come from.</li><li>○ Describe the process for manufacturing ammonia. Write a balanced symbol equation for the manufacture of ammonia.</li><li>○ Interpret graphs of reaction conditions versus rate.</li></ul>				
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	<ul style="list-style-type: none"><li>○ Fertilisers</li></ul>	<ul style="list-style-type: none"><li>○ Recall dynamic equilibrium</li><li>○ Discuss the effect of these conditions on the reaction: a high temperature, a low temperature, a low pressure, use of a catalyst, no catalyst.</li><li>○ Explain how the conditions used in industry affect the equilibrium position, rate and costs of the reaction.</li><li>○ Recall the names of the salts produced when phosphate rock is treated with nitric acid, sulfuric acid and phosphoric acid</li><li>○ Compare the industrial production of fertilisers with laboratory preparations of the same compounds, given appropriate information</li></ul>				
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<b>Chemistry of The Earth's Atmosphere</b>	The composition of the atmosphere	<ul style="list-style-type: none"> <li>○ Describe the composition of the atmosphere.</li> <li>○ Draw accurate pie charts for the composition of the atmosphere.</li> <li>○ Describe the theory of evolution of the Earth's early atmosphere</li> <li>○ To use ratios, fractions and percentages.</li> <li>○ Interpreting data</li> <li>○ Interpreting graphs</li> <li>○ Calculation of moles, mass and volume</li> </ul>	<ul style="list-style-type: none"> <li>○ AFL in lessons and homework</li> <li>○ Mid Topic assessment QWC</li> <li>○ End of topic test-summative assessment</li> </ul>	<ul style="list-style-type: none"> <li>○ Differentiated worksheets</li> <li>○ Flipped Learning</li> <li>○ Exam style questions</li> <li>○ Neeto/satchel quizzes</li> <li>○ Research Task</li> <li>○ YouTube videos with questions</li> <li>○ SAM learning</li> <li>○ Practical write up</li> </ul>	<ul style="list-style-type: none"> <li>○ <b>United in harmony</b> when we consider the wider uses of materials and medicine</li> <li>○ <b>Grateful</b> for the beauty of the different types of atoms</li> <li>○ <b>Faith-filled and hopeful</b> when seeing beyond the naked eye</li> <li>○ <b>Discerning and joyful</b> at the possibilities of science and medicine</li> <li>○ <b>Leading others in pursuit of justice</b> when planning and carrying out a practical</li> <li>○ <b>Service and sacrifice</b> when we acknowledge the work of scientists to protect our environment</li> <li>○ <b>Dignity of the human person</b></li> <li>○ <b>Courageous and resilient</b> when we consider how scientists continue to</li> </ul>	
	Evolution of the Earth's atmosphere	<ul style="list-style-type: none"> <li>○ Describe how N<sub>2</sub>, CO<sub>2</sub>, O<sub>2</sub> got into the atmosphere and</li> <li>○ Explain how algae and plants caused the concentration of oxygen to increase</li> <li>○ Explain how algae and plants caused the concentration of carbon dioxide to decrease</li> <li>○ Describe how sedimentary rocks</li> </ul>				

		<p>formed and locked up carbon dioxide</p> <ul style="list-style-type: none"> <li>○ Conversion of units</li> <li>○ Rearranging equation</li> <li>○ Balancing equations</li> <li>○ Calculating an average</li> <li>○ Drawing results table</li> <li>○ Plotting graphs</li> <li>○ Analysing results</li> </ul>			<p>carry out research to find answers to global warming and climate change</p> <ul style="list-style-type: none"> <li>○ <b>Loving and compassionate</b> When we consider the impact of our actions on the environment and the health of other people.</li> </ul>
	Greenhouse gases	<ul style="list-style-type: none"> <li>○ Name the green house gases</li> <li>○ Describe the effect of greenhouse gases on wavelength</li> </ul>			
	Effect of human activity greenhouse gases	<ul style="list-style-type: none"> <li>○ Describe how greenhouse gases are produced</li> <li>○ Recall two human activities that increase</li> <li>○ The amounts of each greenhouse gas CO<sub>2</sub> and CH<sub>4</sub></li> <li>○ Evaluate the quality of evidence in a report on global climate change given appropriate information.</li> </ul>			

	<p>Climate Change</p> <p>Carbon footprint</p> <p>Atmospheric pollutants</p>	<ul style="list-style-type: none"> <li>○ Describe uncertainties in the evidence base.</li> <li>○ Identify the major cause of Climate change</li> <li>○ Describe four potential effects of climate change</li> <li>○ Describe what a carbon footprint is</li> <li>○ Describe how emissions can be reduced, suggest the consequences of the reduction on the Earth's atmosphere and everyday life</li> <li>○ Describe what a carbon footprint is</li> <li>○ Calculate a person's carbon footprint</li> <li>○ Describe actions to reduce emissions of carbon dioxide and methane.</li> <li>○ Give reasons why actions may be limited</li> <li>○ Write word and symbol equations for</li> </ul>			
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	Effects of pollutant gases	<p>the complete and incomplete combustion of fuels</p> <ul style="list-style-type: none"><li>○ Describe how carbon monoxide, soot, sulphur dioxide, and oxides of nitrogen are produced by</li><li>○ Burning fuels</li><li>○ Predict the products of combustion of a fuel given appropriate information about the composition of the fuel and the conditions which it is used</li><li>○ Describe and explain the problems caused by increased amounts of Carbon monoxide on the human body</li><li>○ Sulphur dioxide and oxides of nitrogen on acidity of rainwater</li><li>○ Sulphur dioxide and oxides of nitrogen on respiratory system</li><li>○ Particulates on global dimming</li><li>○ Particulates on human health</li></ul>			
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