Chemistry – Year 11 Overview

	Term 1	Term 2	Term 3	Term 4	Term 5	Careers
Year 11	**Reactions and Energy 1**	**Quantitative Chemistry**	**Organic Chemistry**	**Earth & The Environment**		
	Acids produce hydrogen ions in aqueous solutions whereas aqueous solutions of alkalis contain hydroxide ions. In neutralisation reactions between an acid and an alkali, hydrogen ions react with hydroxide ions to produce water. Acids can take part in a variety of useful chemical reactions, some of which involve oxidation and reduction. Oxidation is the loss of electrons and reduction is the gain of electrons. ***SEPARATE SCIENCE:*** The volume of acid and alkali solutions that react with each other can be measured by titration using a suitable indicator.	In the conservation of mass, no atoms are lost or made during a chemical reaction, so the mass of the products equals the mass of the reactants. Many chemical reactions take place in solutions; the concentration of a solution can be measured in mass per given volume of solution. Chemical reactions can therefore be represented by symbol equations which can be balanced. ***SEPARATE SCIENCE:*** Percentage yield and atom economy can also be calculated for chemical reactions. mol/dm^3 can also be used as a unit of measurement for concentration of a solution.	The hydrocarbons in crude oil can be separated using fractional distillation. Some of the properties of hydrocarbons depend on the size of their molecules. These properties influence how hydrocarbons are used as fuels. Hydrocarbons can be broken down to produce smaller, more useful molecules in the process of cracking. The products of cracking are alkanes and alkenes. ***SEPARATE SCIENCE:*** Alkenes are hydrocarbons with the functional group C=C. Alcohols contain the functional group -OH. Carboxylic acids have the functional group -COOH. 'Addition polymerisation' and 'condensation polymerisation' are two types	For 200 million years, the composition of the Earth's atmosphere has remained much the same as it is today. However, volcanic activity, the formation of oceans and the presence of life all played a part in changing the atmosphere before this time period. Greenhouse gases are present in the atmosphere and the amount of these has increased, largely due to human activity. Many scientists believe that increased human activity is contributing to an increase in the surface temperature of the earth. An increase in the average global temperature is a major cause of climate change.	The rising human population depend on the earth's natural resources for food, shelter, warmth and transport. Water is a natural resource; it can be made safe to drink or purified using a range of techniques such as distillation, filtration, sterilisation, desalination and reverse osmosis. The environmental impact of resource use in product manufacturing is evaluated through Life Cycle Assessments. Reducing the use of resources, reusing products and recycling materials can have a positive impact on the environment.	**Term 3: A career in the oil and plastic industry.** When studying organic chemistry and crude oil, students will look at the many careers that exist in the oil and plastic industry.

	Electrolysis can be used to extract metals from molten compounds. It can also be used to produce elements when ions are discharged at the electrodes in electrolyte solutions.	**Chemical Methods** A pure substance is a single element or compound, not mixed with anything else. A formulation, however, is a mixture – and one that has been designed as a useful product. Chromatography is a method used to separate some mixtures. Other chemical methods of analysis involve the identification of substances such as common gases. ***SEPARATE SCIENCE:*** Flame tests can be used to identify metal ions. Sodium hydroxide can also be used to identify some metal ions. Instrumental methods can also be used to detect and identify elements and compounds, for example: flame emission spectroscopy.	of reaction in which polymers can be made.		**Exam Preparation** Extensive and explicit recall of knowledge to facilitate effective rehearsal of exam technique. Links between different sections of knowledge are embedded further.	