CHEMISTRY Organic Reactions	***Students will know and remember…***	***So that they can…***
Describe the reactions of the alkenes	Define the term homologous series Name and draw the first five alkenes and alkanes Identify the general formula of alkenes Identify the functional group of the alkenes Describe the test for saturation Identify the products of the reactions between alkenes and halogens Identify the products of the reactions between alkenes and hydrogen Describe the reaction of alkenes with steam Describe the combustion of alkenes using balanced symbol equations	Create balanced symbol equations for the reactions of alkenes Determine the presence of a double bond using the test for saturation
SEPARATE CHEMISTRY ONLY Describe the structure of alcohols, carboxylic acids and esters	Draw the functional groups of alcohols, carboxylic acids and esters Identify the ester ethyl ethanoate Draw the first five carboxylic acids Draw the first five alcohols	Create displayed formulae for complex organic molecules Use IUPAC nomenclature to name organic molecules
SEPARATE CHEMISTRY ONLY Describe the reactions and uses of alcohols	Recall the structures of the first 5 alcohols Compare how alcohol is synthesised using fermentation and hydration of ethane Describe the reactions of alcohols with sodium Describe the combustion reactions of alcohols Describe the oxidation reactions of alcohols	Write balanced symbol equations for the reactions of the alcohols Design a practical method to test the reactivity of different alcohols

CHEMISTRY Polymers	*Students will know and remember…*	*So that they can…*
Explain how addition polymers are formed	Define the terms polymer, monomer and polymerisation Identify the conditions for addition polymerisation Draw diagrams to represent the formation of a polymer from a monomer Explain why the properties of the polymer are different from the monomer	Predict the properties of polymers from their monomer
SEPARATE CHEMISTRY ONLY Explain how condensation polymers are formed	Define the term condensation polymerisation Identify the products of a condensation polymerisation reaction Draw diagrams to represent the formation of a polymer from a monomer Compare condensation and addition polymerisation reactions	Use data to reach a conclusion
SEPARATE CHEMISTRY ONLY Describe the natural polymers produced by biological organisms	Identify the monomers in starch, cellulose and proteins Describe how amino acids react together to form proteins Explain how a peptide link is formed	
SEPARATE CHEMISTRY ONLY Describe the structure of DNA	Define the terms DNA and nucleotide Draw the basic structure of a nucleotide Describe the polymerisation of the nucleotides to form DNA Describe the way that monomers are arranged to form the DNA structure	The development of the structure of DNA using X-Ray crystallography by Watson, Crick, Franklin and Wilkins

CHEMISTRY ***The Earth's Atmosphere***	***Students will know and remember…***	***So that they can…***
Describe the composition of the early Atmosphere	The gases that made up the early atmosphere How the gases were produced in the early atmosphere	Calculate percentage composition Evaluate how theories of the Earth's early atmosphere can be developed from data
Explain how the modern atmosphere has evolved	The gases in the current atmosphere The evolution of green plants The processes that lead to the gases that are in the current atmosphere	Compare the levels of gases in the early and current atmosphere Calculate percentage composition
Explain the process of the Greenhouse effect	The names of greenhouse gases The greenhouse effect	Apply a simple model to a complex system
Explain the impact of global climate change	The difference between the greenhouse effect, global warming and climate change	Interpret data taken over extended periods of time
Describe the impacts of different pollutants	What complete and incomplete combustion are How different pollutant gasses are produced The effect of different polluting gases	Use calorimetry to determine the energy released be a fuel Calculate the energy released by different fuels
Compare the methods of reducing pollutant gases	How to reduce the levels of polluting gases	Evaluate methods of reducing different greenhouse gasses

CHEMISTRY ***The Earth's Resources***	***Students will know and remember…***	***So that they can…***
Describe the difference between finite and renewable resources	Identify renewable resources Identify finite resources	
Explain how water can be made potable	Define the term potable The difference between pure and potable water Describe the process of water purification in the UK Explain how bore holes and distillation can be used to access purified water	Use the process of distillation to purify water Identify if water is pure using boiling point and pH data Evaluate a practical method Justify the method of purifying water given different environmental and socioeconomic factors
Explain how waste water is treated	Identify the process of purifying waste water Explain how each stage purifies the water	
Explain how metals are extracted from high grade ores	Describe the process of reduction Explain how carbon is used to produce pure metals Explain why metals above carbon in the reactivity series are extracted from their ore Describe the process of electrolysis	Use REDOX equations to show the production of pure metals Create half equations for electrolysis
Explain how metals are extracted from low grade ores	Describe the process of phytomining Describe the process of Bioleaching Evaluate the use of bioleaching and phytomining when extracting metals from low grade ores	
Evaluate a product using a life cycle assessment	Identify the stages in a life cycle assessment Use a Life Cycle Assessment to evaluate a materials used to make a product	

Explain the process of reduce, reuse and recycle	Describe how materials can be reduced, reused or recycled. Evaluate the materials used to make a product.	

CHEMISTRY ***Chemical Analysis***	***Students will know and remember…***	***So that they can…***
Compare pure substances and mixtures	How formulations are produced The different between pure substances and mixtures How to separate mixture How to identify if a compound is a pure compound	Use melting point data to identify pure substances and mixtures
Describe how to set up a chromatogram	What chromatograms are used for How to set up a chromatogram	Interpret a chromatogram to identify pure substances and mixtures
Explain how a chromatogram is used to analyse pure substances and mixtures	Explain why substances travel through a chromatogram Explain why some substances do not travel on a chromatogram Explain why the solvent affects the distance a substance will travel	Interpret a chromatogram to identify pure substances and mixtures Calculate Rf values Create a conclusion using Rf values and images of a chromatogram
Describe chemical test for different gases	The gas tests for: Oxygen Carbon Dioxide Hydrogen Chlorine	Identify gases using gas tests Create a conclusion using the data collected from gas test experiments
Describe the chemical tests for cations	The chemical tests for Li, K, Na, Ca, Mg, Al, Cu How to set up a flame test How to use NaOH to test for cations How to further process precipitates to identify the cation	Record data to identify unknown substances
Describe the test for negative ions	The chemical tests for carbonate, sulphate and halide ions	Record data to identify unknown substances
Describe the process of analysing a compound in a laboratory	The process of Flame Emission Spectroscopy	Compare chemical and lab based tests to identify unknown compounds

Using Earth's Resources	*Students will know and remember…*	*So that they can…*
Explain the process of rusting	Identify the conditions required for iron to rust Name the product of the rusting process Describe rusting as oxidation Compare the properties of Iron and Iron(III) oxide Describe how to prevent rusting	Determine the conditions required for rusting using experimental data
Explain the properties of different alloys	Define the term alloy Draw diagrams representing a pure metal and an alloyed metal Name the composition of common alloys Explain why metals are alloyed Interpret the composition and use of alloys Evaluate the uses of alloys for different scenarios	Determine the ratio of the composite atoms in an alloy Evaluate the properties of different alloys
Explain the properties of different polymers	Define the term polymer Describe how changing the reaction conditions can modify the polymers that are created Describe the difference between thermosetting and thermosoftening polymers	Evaluate and justify the choice of a polymer for a use, given data about that polymer
Compare the properties of glass, ceramics and composites	Identify the type of bonding in glass, ceramics and composites Use the crystal structure of glass and ceramics to explain their properties Explain why composites are used	Evaluate and justify the choice of a material for a use, given data about that material
Describe the process of the Haber process	Identify the reactants and products of the Haber process Explain why the Haber process is essential for human survival Identify the source of the reactants for the Haber process Explain why a catalysts is used in the Haber process	
Explain the conditions chosen for the Haber process	Define the terms equilibrium and yield Explain how changing the pressure effects the yield of the Haber process Explain how changing the temperature effects the rate and yield of the Haber process Identify the optimal conditions for the Haber process Justify the choice of conditions for the Haber process	Interpret graphical data to identify the optimal conditions for the Haber process
Describe how fertilisers are made in the laboratory	Identify the elements that are required for fertilisers Describe how ammonia is neutralised to produce a fertiliser Describe the process of producing a fertiliser in a laboratory using crystallisation	Calculate the percentage composition of NPK in fertilisers Write balanced symbol equations for neutralisation reactions
Explain how fertilisers are made in industry	Describe how feed stocks are obtained for producing fertilisers in industry	

	Identify the process that are involved in making fertilisers on an industrial scale Compare the methods of producing fertilisers in the lab and in industry	