Chemistry Curriculum Overview - Year 11 - Triple

Unit	Details
Organic	In this unit pupils learn about hydrocarbons by learning about crude oil as a source of hydrocarbons and the fractional distillation of crude oil. They should be able to describe how the size of the hydrocarbon molecule affects its properties. They then begin a tour of several homologous series (alkanes, alkenes, alcohols, carboxylic acid and ester looking at the functional groups and reactions of each group. The carboxylic acid unit allows the pupil to revisit acids and their reactions from chemical changes. Pupils will learn about different types of manufactured polymers, including addition polymers and condensation polymers. They also should be able to describe the basic principles of condensation polymerisation. Finally they move on to consider natural polymers, including polysaccharides, proteins, and DNA and be able to describe the basic structure of DNA learning how amino acids react together to form proteins.
Analysis	Pupils learn about various techniques for analysing substances. All pupils should now understand the difference between a pure substance, a mixture, and a formulation, and what is meant by purity. They will build upon their understanding of chromatography experiments from *atomic structure* and be able to analyse a chromatogram, both qualitatively and quantitatively using *R*f values. Pupils should also be able to describe the different experimental tests for gases, including both the procedure and positive result. They should also be able to describe experimental tests for positive and negative ions, and be able to write balanced symbol equations for them, applying their knowledge of all of the tests they have learnt to be able to plan an investigation to identify positive and negative ions. Pupils finally study flame emission spectroscopy and should be able to interpret instrumental results.
The Atmosphere	Pupils learn how volcanic activity has developed our theory of the origin of the atmosphere and learn to interpret evidence concerning other theories and evaluate them. Along with an understanding of the origins of the atmosphere, pupils should also understand how it has evolved over time. They will be able to describe the human activities that are thought to cause global warming and have resulted in some of the changes to the atmosphere, and be able to explain some of the effects this has on the climate of the Earth. Pupils should also be able to explain the effect of other pollutants on the Earth. Throughout this unit, pupils have had many opportunities to develop their working scientific skills, including evaluating models and interpreting and evaluating evidence for scientific theories.
The Earth's Resources	Pupils will learn about the difference between finite and renewable resources and use this to consider reuse, recycle and reduce, carrying out life cycle assessments on products.They then look at specific resources that we use, including water and metals (in particular copper). Pupils will describe the different ways that water is treated, both to create potable water and to remove waste products so it is safe to release into the environment.Using their understanding of rusting from KS3 to understand how both water and air are required for iron to corrode. They then look at alloys, polymers, ceramics, glass, and composites, some of which have previously been met in structure and bonding and organic chemistry..Pupils study the Haber process and how it is carried out economically on an industrial scale, understanding the reason for compromise conditions. This builds extensively upon knowledge of equilibrium conditions, recognising the importance of the Haber process in the production of ammonia and explaining how ammonia is an important feedstock in the production of fertilisers, both in the laboratory and industrially alongside potassium and phosphorus fertilisers.