EMMANUEL COLLEGE
THE SCIENCE DEPARTMENT
Year 11

Year 11	Autumn, Half-Term 1	Autumn, Half-Term 2 and Spring Half-Term 1	Spring, Half-Term 2
Unit Title	Chemical Analysis	Chemistry of the Atmosphere	Using Resources
Key Question(s)?	How do we detect specific chemicals?	How has the atmosphere formed and how does its composition affect us today?	How do chemists develop products that are useful for everyday life?
Threshold Concepts	Analysts have developed a range of qualitative tests to detect specific chemicals. The tests are based on reactions that produce a gas with distinctive properties, or a colour change or an insoluble solid that appears as a precipitate. Instrumental methods provide fast, sensitive and accurate means of analysing chemicals, and are particularly useful when the amount of chemical being analysed is small. Forensic scientists and drug control scientists rely on such instrumental methods in their work.	For 200 million years, the proportions of different gases in the atmosphere have been much the same as they are today: • about four-fifths (approximately 80%) nitrogen • about one-fifth (approximately 20%) oxygen • small proportions of various other gases, including carbon dioxide, water vapour and noble gases. An increase in average global temperature is a major cause of climate change. There are several potential effects of global climate change. The gases released into the atmosphere when a fuel is burned may include carbon dioxide, water vapour, carbon monoxide, sulfur dioxide and oxides of nitrogen. Solid particles and unburned hydrocarbons may also be released that form particulates in the atmosphere.	Industries use the earth's natural resources to manufacture useful products. In order to operate sustainably, chemists seek to minimise the use of limited resources, use of energy, waste and environmental impact in the manufacture of these products. Chemists also aim to develop ways of disposing of products at the end of their useful life in ways that ensure that materials and stored energy are utilised. Pollution, disposal of waste products and changing land use has a significant effect on the environment, and environmental chemists study how human activity has affected the earth's natural cycles, and how damaging effects can be minimised.
Link to Prior Learning	This builds on the mixtures and separation topics covered in both Year 7 and Year 9.	This builds on an introduction to the atmosphere which was covered in Year 8.	This builds on an introduction to types of chemicals covered in Year 7 and Year 8.
Knowledge and Sequencing Rationale	In Year 11, the triple award and combined science students are on very different topic streams. We follow the order of the specification with this year group, but we ensure that we review C1 and C2 again as part of interleaved practice and also review C5 and C6, which was covered in Year 9. This is essential as C7-C10 are the real-world applications of the core knowledge that has been		

	taught in C1-C6. We feel that students in Year 11 are able to work through the application units at this stage as they should have the core knowledge, but we ensure it is appropriately revised at the start of each lesson (See SoW).