Ravens Wood School
KS4 Curriculum Plan

Subject: Chemistry C10 Using Resources

Overarching Topic:			
Why is this topic being studied at this time? How does it fit into the wider subject curriculum?	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.		
	Essential	**Core**	**Ambitious**
The Big Questions (What questions will students be able to answer upon mastery of the topic?)	• What are the stages of sewage treatment? • What term is used to describe water that is drinkable (not pure)? • What are the stages to produce potable water? • What is a finite resource? What is a renewable resource? • What are three examples of finite resources? • What are 4 things that humans use resources for? • What are ways of reducing the use of resources? • What is sustainable development? • What does LCA stand for? • What are three materials made using crude oil? • What are three materials that can be reused?	• What are the reasons for each stage of producing potable water from waste water? • What is the difference between potable water and pure water? • What are three things that scientists will measure when marrying out a LCA for a product? • What are the disadvantages of desalination? • What are the advantages and disadvantages of different methods of reducing use of resources?	• What method is appropriate for producing potable water in the UK? • Why might the method of producing potable be different (to the UK) in countries with low rainfall? • How could you use a LCA to compare the use of plastic bags and paper bags?
	TRIPLE ONLY QUESTIONS • Name two types of glass. • Give two examples of ceramics. • What is a composite material? • Which method of extracting copper uses plants to absorb the copper from the ground? • Which process of extracting copper uses bacteria?	**TRIPLE ONLY QUESTIONS** • What are the environmental impacts of metal extraction?	**TRIPLE ONLY QUESTIONS** • What are the advantages and disadvantages of different methods of metal extraction?

The Key Skills/ Techniques

The sophistication and application of skills will become more advanced as students' progress through the critical, core and pinnacle knowledge.

Skill/Technique	How will this skill be developed?
1. Graphing & Drawing	Draw graphs with suitable scales, axes and units. Correct line of best fit. Appreciation of anomalies and processed data. Scientific drawing of cells, concepts and scientific equipment.
2. Variables	Identify independent, dependent and control variables and devise experiments to include these to ensure valid results. Appreciation of uncertainty.
3. Data Analysis	Describe, explain and predict trends. Graph and table data interpretation. Identify links and patters within and between topics. Statistical analysis of data to include mode/median/mean/range determination. Drawing justified conclusions from presented data.
4. Application	Apply known and taught theory in unfamiliar contexts. Making links to taught theory and extracting key ideas. Communicating using correct scientific terminology.
5. Working Scientifically	Identify hazards and planning to limit risk. Describe how to improve accuracy/precision/repeatability/reproducibility/validity. Evaluate reliability of methods and investigations, taking in to account data analysis.