



Subject: Year 9 C.3 Chemical Changes

Overarching Topic: Chemical Changes			
<p>Why is this topic being studied at this time?</p> <p>How does it fit into the wider subject curriculum?</p>	<p>Understanding of chemical changes began when people began experimenting with chemical reactions in a systematic way and organizing their results logically. Knowing about these different chemical changes meant that scientists could begin to predict exactly what new substances would be formed and use this knowledge to develop a wide range of different materials and processes. It also helped biochemists to understand the complex reactions that take place in living organisms. The extraction of important resources from the earth makes use of the way that some elements and compounds react with each other and how easily they can be 'pulled apart'.</p>		
	Critical	Core	Pinnacle
<p>The Big Questions (What questions will students be able to answer upon mastery of the topic?)</p>	<ul style="list-style-type: none"> What is the reactivity series of metals? What are the stages involved in turning an ore into an actual metal? What is a neutralisation reaction? What ions are found in acids? What ions are found in alkalis? What is the pH scale? When can an ionic compound conduct electricity? 	<ul style="list-style-type: none"> What are oxidation and reduction? How is gold found in nature? Why? How are salts formed from acids? How would you produce a solid sample of a soluble salt from its insoluble base and an acid? What affects the pH of an acid? How could you find the pH of an unknown sample? How does electrolysis separate compounds? How could you place an unknown element into the reactivity series? How is electrolysis of a solution different to a molten ionic compound? 	<ul style="list-style-type: none"> Why are carbon and hydrogen included in the reactivity series of metals? What is the difference between a diluted strong acid and a concentrated weak acid? What are the different reactions at the cathode and anode during electrolysis? Rare metals are metals important in mobile phones but they are being mined on thermal vents where early life formed at the bottom of the sea, what issues might arise? Are there alternatives?
<p>The Key Skills/ Techniques</p>	<p>The sophistication and application of skills will become more advanced as students' progress through the critical, core and pinnacle knowledge.</p>		
	<p>Skill/Technique</p>	<p>How will this skill be developed?</p>	
	<p>1. Graphing & Drawing</p>	<p>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.</p>	
	<p>2. Variables</p>	<p>Identify independent, dependent and control variables and devise experiments to include these to ensure valid results. Appreciation of uncertainty.</p>	
	<p>3. Data Analysis</p>	<p>Describe, explain and predict trends. Graph and table data interpretation. Identify links and patterns within and between topics. Statistical analysis of data to include mode/median/mean/range determination. Drawing justified conclusions from presented data.</p>	
	<p>4. Application</p>	<p>Apply known and taught theory in unfamiliar contexts. Making links to taught theory and extracting key ideas. Communicating using correct scientific terminology.</p>	
<p>5. Working Scientifically</p>	<p>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.</p>		

