

## Chemical Changes - combined

Content	RAG
Recall that metals react with oxygen to produce metal oxides. The reactions are oxidation reactions because the metals gain oxygen.	
Explain reduction and oxidation in terms of loss or gain of oxygen	
Explain what determines the reactivity of a metal.	
Explain why displacement reactions occur.	
State and describe the reactions, if any, of potassium, sodium, lithium, calcium, magnesium, zinc, iron and copper with water and dilute acids.	
Place these metals in order of reactivity. Deduce an order of reactivity of metals based on experimental results.	
Explain why some metals such as gold are found in the Earth as the metal itself but most metals are found as compounds that require chemical reactions to extract the metal.	
Relate the method of extraction to the position of the metal on the reactivity series	
Acids react with some metals to produce salts and hydrogen	
Acids are neutralised by alkalis and bases to produce salts and water, and by metal carbonates to produce salts, water and carbon dioxide.	
Name the salts produced by neutralisation reactions	
Explain how to make soluble salts from acids. (Required practical activity)	
Acids produce hydrogen ions ( $H^+$ ) and alkalis produce hydroxide ions ( $OH^-$ ) in aqueous solutions. In neutralisation they react to form water.	
Describe what the pH scale is and how it is used. Describe the use of universal indicator or wide range indicator to measure approximate pH.	
Describe the process of electrolysis and state what is meant by an electrolyte.	
Predict the products of electrolysis.	
Describe how aluminium is extracted from its ore using electrolysis, including why cryolite is needed.	
Explain why the positive anode must be continually replaced during the extraction of aluminium.	1

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<i>State what strong and weak acids are and give examples.</i>	
<i>Recall that for a given concentration of aqueous solutions, the stronger an acid, the lower the pH.</i>	
<i>Recall that as the pH decreases by one unit, the hydrogen ion concentration of the solution increases by a factor of 10.</i>	
<i>Describe and explain what happens at the cathode (negative electrode) and anode (positive electrode) in terms of electrons, oxidation and reduction.</i>	
<i>Write half equations for the reactions occurring at the electrodes.</i>	

*Text in italics = higher tier only.*