

Meden School Curriculum Planning							
Subject	Chemistry	Year Group	8	Sequence No.	7	Topic	Reactions of Metals

Retrieval	Core Knowledge	Student Thinking
<p>What do teachers need retrieve from students before they start teaching new content?</p>	<p>What specific ambitious knowledge do teachers need teach students in this sequence of learning?</p>	<p>What real life examples can be applied to this sequence of learning to development of our students thinking, encouraging them to see the inequalities around them and 'do something about them!'</p>
<p>KS2: An irreversible change is when a material turns into a completely new and different material. The new material can't be changed back into what it was before. Irreversible change can sometimes occur when you heat, combust or combine two or more substances together.</p> <p>KS3 (Y7 Physical and Chemical Change): A chemical change is an irreversible reaction.</p> <p>KS3 (Y7 Acids and Alkalis): Alkalis cause universal indicator to go blue/purple</p> <p>KS3 (Y8 Chemical tests): The test for hydrogen gas is the squeaky pop test.</p>	<p>L1: Most metals undergo an irreversible change called corrosion. Corrosion is an example of a chemical reaction, where reactants are turned into products. Some metals such as gold are unreactive. Chemical reactions can be expressed using a word equation. The corrosion of iron has a special name, known as rusting. Corrosion is caused by the metal reacting with oxygen to form metal oxide. Any reaction that forms a metal oxide is an oxidation reaction. Oxidation is the gain of oxygen by an element of compound.</p> <p>L2: Most metals are unreactive when in contact with water. However, metals found in group 1 of the periodic table react vigorously with water. Group 1 (alkali metals) are soft, light, and very reactive. They get more reactive going down the group. When reacted with water they produce hydrogen gas and metal hydroxide. Metal hydroxide in solution is alkali and will turn universal indicator blue/purple.</p> <p>L3: When a metal reacts with an acid, hydrogen gas is produced. This can be confirmed using the squeaky pop test. When reacting with a metal: hydrochloric acid forms chloride salts; sulfuric acid forms sulfate salts; nitric acid forms nitrate salts.</p> <p>L4: Metals can be ordered by how reactive they are with acids. This can be tested by observing the number of bubbles given off during the reaction. The independent variable is what we change or investigate. The dependent variable is what we measure or observe. The control variable is what we keep the same.</p> <p>L5: Metals can be ranked in order of reactivity – this is known as the reactivity series. The most reactive metals are found at the top of the reactivity series; the least reactive are found at the bottom. Carbon and hydrogen (both non-metals) are also included in the reactivity series.</p> <p>L6&7: If a metal replaces another metal in a compound it is known as a displacement reaction. The most reactive metal will always replace the least reactive metal. This means metals higher in the reactivity series will replace those found below them. A metal that is lower in reactivity cannot replace a more reactive metal. Displacement reactions can be shown experimentally by reacting metals with various metal compound solutions.</p>	

L8: A **metal ore** is a naturally occurring rock that contains enough metal to make it **worthwhile extracting**. When considering whether a rock should be classified as an ore the following should be taken into account: the **time** it would take to extract the metal; the **cost** of extraction; the **effort** required to extract the metal. **Bauxite** is the name given to aluminium ore. Metals found below hydrogen in the reactivity series are found in the ground as **pure metals**, those above hydrogen are found as ores. Ores found below carbon in the reactivity series can be extracted by **heating them with carbon** (a displacement reaction), those found above carbon are extracted using other methods.

L9: **Ions** are charged particles. **Ionic compounds** are made from positive metal ions and negative non-metal ions. When heated or dissolved in water, ions are **free to move**. **Electrolysis** is the **splitting up** of an ionic compound **using electricity**. The **electrolyte** is the liquid required for electrolysis to happen, the **electrode** is the solid submerged in the electrolyte that conducts the electricity. When an electric current is applied to a molten or aqueous metal compound, metal ions will move towards the negative electrode, non-metal ions will move to the positive electrode. A metal is formed at the negative electrode, a non-metal is formed at the positive electrode.

L10: **Bioleaching** and **phytomining** can be used to extract copper from **low quality ores**. During bioleaching **bacteria** breaks bonds between molecules to release copper. Bioleaching is very slow. In phytomining **plants** are grown on low quality ore soil. Copper is taken up by the plant and extracted by **combusting** their dried leaves. Phytomining uses high amount of energy.

L11: Revision lesson.

L10: Presentational skills, and the advantage to students of good oracy.