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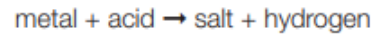
Metals and non-metals

1	I can state that metal and non-metal oxides react differently with water and I can describe these differences
2	I can list the properties of metals and non-metals and I can describe how these properties make them suitable for different uses
3	I can explain how metals and non-metals react with water using word equations
4	I can state that some materials are more reactive than others and describe simple displacement reactions

	Keyword	Definition
1	chemical reaction	A change in which atoms are rearranged to create new substances.
2	chemical symbol	A one- or two-letter code for an element that is used by scientists in all countries.
3	displacement	Reaction where a more reactive metal takes the place of a less reactive metal in a compound.
4	metal	Elements on the left of the stepped line of the Periodic Table. Most metals are shiny, good conductors of electricity and heat, malleable and ductile, and solid at room temperature.
5	oxide	A substance made up of a metal or non-metal element joined to oxygen.
6	product	A substance that is made in a chemical reaction.
7	reactant	A starting substance in a chemical reaction.
8	reactivity series	A list of metals in order of how vigorously they react.

Metal reactions

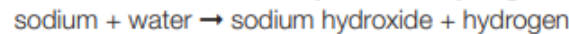
When a metal reacts with an acid it will produce a salt and hydrogen gas, the fizzing that you see is the hydrogen gas being given off



When a metal reacts with oxygen a metal **oxide** is formed, this process is known as **oxidation**



- When a metal reacts with water it forms a metal **hydroxide** and hydrogen gas.
- The alkali (group 1) metals react most vigorously, giving off a brightly coloured flame



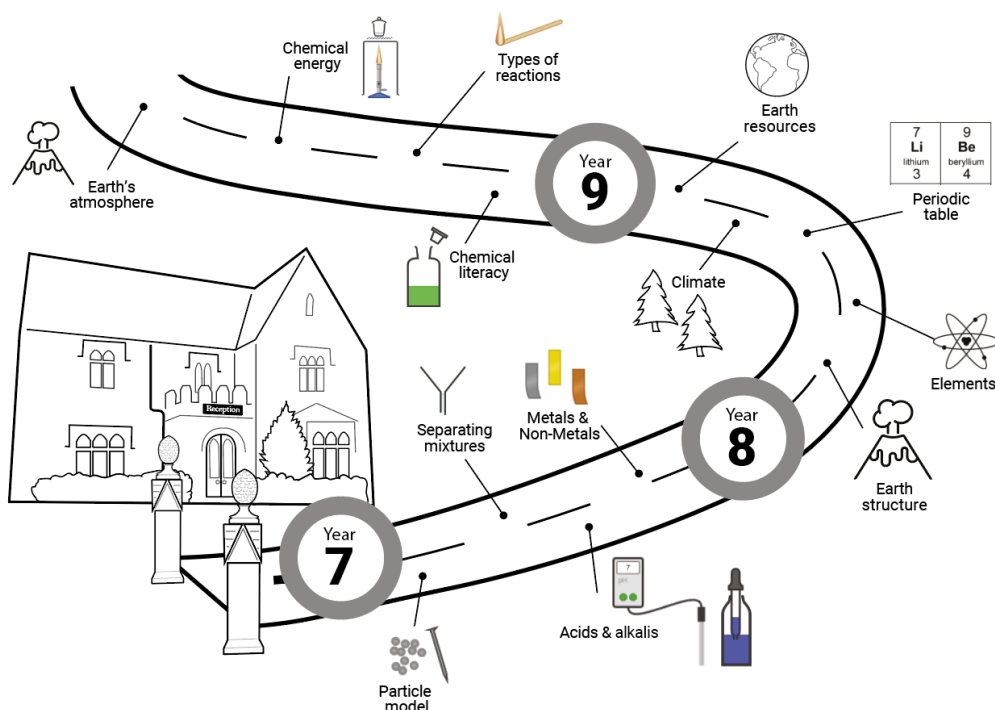
When a more reactive metal reacts with a compound containing a less reactive metal, it can take it's place, this is known as a **displacement** reaction



- If the metal on it's own is higher in the **reactivity series** than the metal in the compound a reaction will take place
- If the metal on it's own is lower in the reactivity series than the metal in the compound, a reaction will not take place

Why?

Chemical reactions occur in all forms of life such as toothpaste and beestings. It is important to learn how metals are extracted leading to sustainability of materials.



Chemical reactions

- A **chemical** reaction is a change in which atoms are rearranged to make new substances
- A **reversible** reaction is one where the products can react to get back the substances which you started with, most chemical reactions are not reversible
- You can look for signs that a chemical reaction has taken place such as flames, smells, heat change, a loud bang or gentle fizz

Prior Knowledge From KS2:

Chemical reactions occur in all forms of life such as toothpaste and beestings. It is important to learn how metals are extracted leading to sustainability of materials.

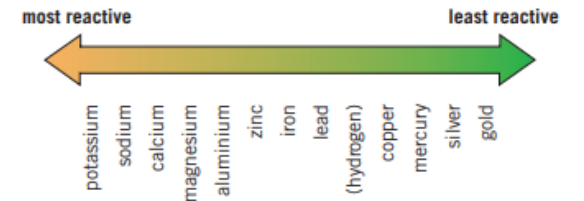
Future Learning:

At GCSE you learn in more detail about the reactivity series and various extraction methods of metals from their ores. You will also learn about acids and their strengths

along with neutralisation reactions.

The reactivity series

- The **reactivity series** describes how reactive different metals are compared to one another
- The higher the metal is in the reactivity series the more reactive it will be this means that it will react much more vigorously



Careers:

Chemist
Chemical engineer
Product tester
Health and safety inspector

Homework Menu Grid

Topic	1 Point	2 Points	4 Points	6 Points	10 Points
Properties of Metals 	Colour in a periodic table to show where the metals and non-metals are located	Create two truths and one lie about the properties of metals	Create a poster to explain the similarities and differences between metals and non-metals	'Glass is an element'. Is this correct? Justify your answer	Research metallic bonding. Explain what it is and draw a diagram
Chemical reactions of metals and non-metals 	Write a list of properties of metals	Create a mnemonic to help you remember the difference between physical and chemical properties	Create a poster demonstrating the reactions of metals and non-metals	"When writing word equations, the products always go on the left". Is this correct? Why? Write a word equation to back up your answer	Research what oxygen and reduction are in terms of oxygen. Write a paragraph about your findings and a word equation to show an example of reduction and oxidation
Metals and acids 	Write down the word equation for the reaction between magnesium and hydrochloric acid to produce magnesium chloride and hydrogen gas	Write a paragraph to compare the reaction of metals with acids, with the reaction of acids and alkalis	Draw a diagram of a molecule and a compound, and explain how they are different	'Copper will react quickly with hydrochloric acid'. Do you agree? Explain why	Write down a method for testing how much hydrogen is produced when magnesium, copper and zinc are added to acid. Make sure to include all of the variables.
Metals and Oxygen 	Write down the word equation for the reaction between magnesium and oxygen to produce magnesium oxide	Create a poem or acronym etc to help you remember the word equations for the reactions of metals with acids and metals with oxygen	Draw scientific diagrams of all of the equipment you used in the experiment and state what each piece of equipment is used for	A piece of steel wool is burned. Before burning, I weighed 1g. After burning, it weighed 1.1g. Explain why	Write down the method for reacting metals with oxygen. Include the independent, dependent and controlled variables
Metals and Water 	Write down the word equation for the reaction between lithium and water to create lithium hydroxide and hydrogen	Deduce the chemical formulae for all of the substances from the 1 point task and write the symbol equation	Create a poster for this reaction. Include a diagram, and the reactivity of sodium, lithium and potassium with water.	"potassium was the least reactive metal". Do you agree? Explain why	Research the metals and water practical and find out what potentially could go wrong and how to stop things going wrong.
Metal displacement reactions 	Write down a definition of 'displacement'. Give an example of something being displaced	Create a mnemonic to remember the reactivity series	Magnesium + oxygen → magnesium oxide Is this a displacement reaction? Explain your answer. If not, give an example of a displacement	'Gold will displace copper in copper sulphate solution, to produce gold sulphate'. Is this correct? Explain why	Write a method to test for displacement reactions between magnesium, zinc, iron, copper and sulphate solutions of all of those metals. Include all variables.