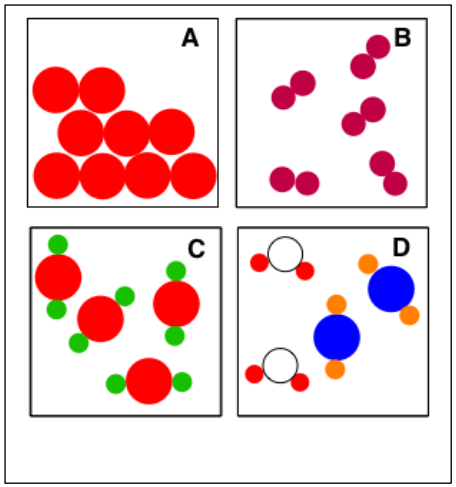
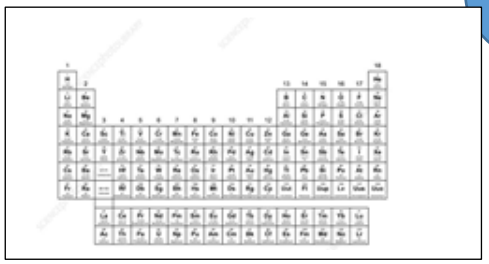




What I know from year7 science:

That elements are made of one type of atom only

Elements are found on the periodic table

Atoms are the smallest building blocks of elements.

Describe how elements react together to form compounds that have different properties.

State the symbols for some common elements

Give the group and period for an element

Describe the key differences between elements , compounds and mixtures .

Explain **why** elements are in particular groups (shared properties) and write word equations.

Discuss how Mendeleev organised the elements in his PT and explain why his PT was more successful than other

Describe the properties of metals and non-metals.

Match the uses of metals to their properties

Be able to put metals in order of reactivity based on observations made.

Make predictions of displacement reactions using the reactivity series.

Detail the process of extracting metals with carbon

Outline a disadvantage and a disadvantage of mining and recycling of metals

Identify modern materials (ceramics, composites and polymers) and link properties to their use.

Future learning

Naming and writing chemical formulae

Oxidation reactions

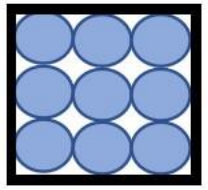
Consequences of products of oxidation (Global Warming)

Vocabulary: atom, element, compound, periodic table, Mendeleev. Reactivity, displacement, groups , periods, ceramic, polymer, composite, reduction, extraction

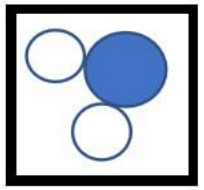
Year 8 CHEMISTRY UNIT 1
Periodic table, Elements, Metals and Non-metals

Keyword	Definition
Periodic Table	A table of all the known elements in order of their atomic number.
Group	Vertical columns on the periodic table
Period	Horizontal rows on the periodic table
Atom	The smallest piece of an element.
Element	A substance containing only one type of atom.
Compound	Two or more different elements which are chemically joined together.
Mixture	Two or more different elements or compounds which are not chemically joined together.

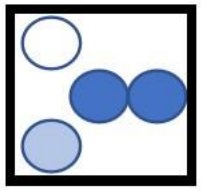
Atoms, Elements, Compounds & Mixtures



This models an element.
There is only one type of atom.



This models a compound.
There are two different elements chemically combined together.



This models a mixture.
There are two or more different elements which are not chemically combined.

Metals	Non-Metals
Shiny in colour, solids at room temperature (except mercury), high density, strong, malleable, good conductor of heat and electricity.	Dull in colour, can be solids, liquids or gases at room temperature, low density, brittle, poor conductors of heat and electricity.

Chemical & Physical Reaction

Chemical changes happen when chemical reactions occur. They involve the formation of new chemical elements or compounds.
E.g. Iron will react with oxygen to form Iron Oxide (rust).

Physical changes do not lead to new chemical substances forming. In a physical change, a substance simply changes physical state. E.g. A solid to a liquid.

The periodic table is arranged in rows called periods and columns called groups. Groups contain elements with similar chemical properties.

Group 1 – Alkali Metals

Group 1 metals are very soft metals which can be cut with a knife. They have very low melting and boiling points and are very reactive compared to other metals. The elements become more reactive as you go down group 1.

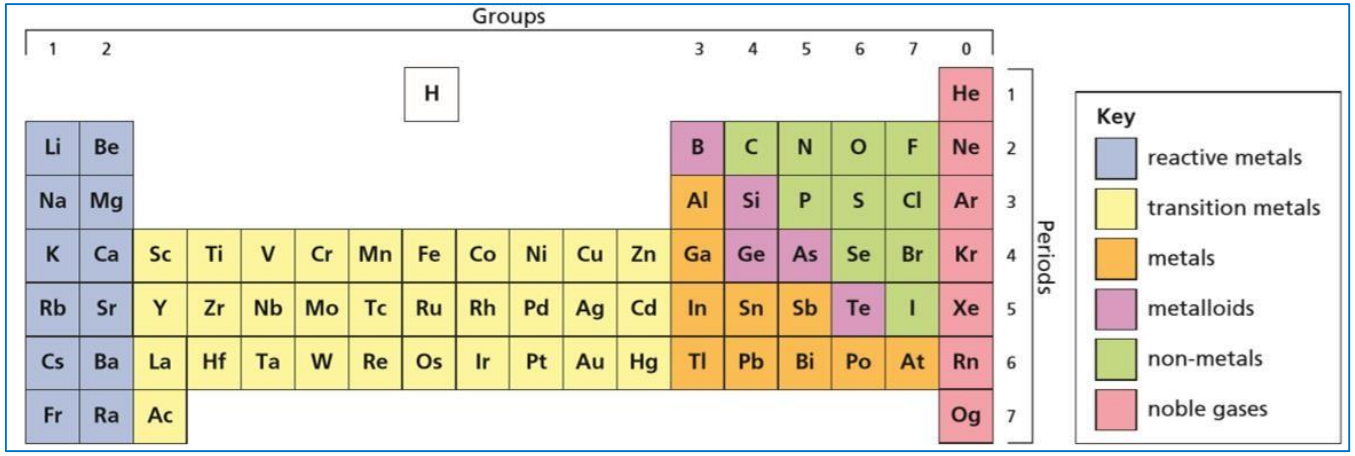
When the group 1 metals react in water they produce a metal hydroxide and hydrogen gas.
E.g.
Lithium + Water → Lithium Hydroxide + Hydrogen

Group 7 – The Halogens

Group 7 elements become less reactive when you move down the group. This can be shown as a displacement reaction.

Group 0 – The Noble Gases

Group 0 elements are not reactive. This is because the atoms have full outer shells.



Year 8 CHEMISTRY UNIT 1
Periodic table, Elements, Metals and Non-metals

Chemical Reactions & Equations
The changes in a chemical reaction can be modelled using equations. In general we write:

Reactants → Product

The reactants are shown the left of the arrow, and the products are shown on the right of the arrow. The arrow tells us a chemical reaction has taken place.

E.g.
Iron + Oxygen → Iron Oxide

The Iron and oxygen react together (reactants) to produce Iron Oxide (product).

Naming Compounds
Metal + Non-Metal (which contain two elements)
1. The metal always goes first.
2. The ending of the non-metal changes to 'ide'.

E.g.
Copper + Oxygen → Copper Oxide
Lithium + Fluorine → Lithium Fluoride

To name compounds which have a metal, non-metal and oxygen (three or more elements)
1. The metal always goes first.
2. The ending of the non-metal changes to 'ate'.

E.g.
Copper, Sulfur, Oxygen
Copper Sulfate

Displacement Reactions
Displacement reactions involve a metal and a compound of a different metal. In displacement reactions, a more reactive metal will displace a less reactive metal from its compound.
Magnesium + Copper Sulfate → Magnesium Sulfate + Copper

Magnesium is more reactive than copper, so it displaces (pushes out) the copper within the compound.

Reactivity Series

Some metals are very unreactive. This means they don't take part in chemical reactions. For example platinum. Some metals are very reactive and they take part in chemical reactions easily to form new substances.

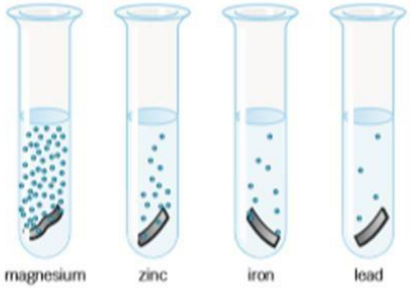
Chemical Reaction	A process in which one or more substances are changed into others, by their atoms being rearranged. Also known as irreversible reactions.
Physical Reaction	A process in which the physical properties are changed, but no new substances are made. Also known as reversible reactions.
Reactant	A substance that reacts together with another substance to form products during a chemical reaction.
Product	A substance formed in a chemical reaction.
Conservation of Mass	The total mass of the products in a chemical reaction will be the same as the total mass of the reactant.

Reacting acids with metals

A **chemical reaction** is a change in which new products are made. There are clues that we can look for to spot a chemical reaction. These include:

- bubbles of gas being given off;
- a change in temperature;
- a colour change;
- a change in mass.

When we add an **acid** to most metals, we see bubbles. This is because a gas is produced during the reaction. We may also feel the test tube getting warmer. These observations are both evidence that a chemical reaction has taken place.



▲ Metals reacting with hydrochloric acid.

Oxidation

Oxidation is the name given to a chemical reaction in which oxygen is added to a substance. When a metal such as copper is heated in air it reacts with oxygen. Black copper oxide is formed:

copper + oxygen → copper oxide

We can also show these reactions using particle diagrams:

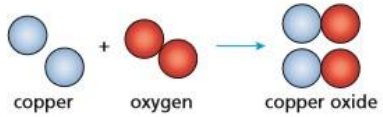


FIGURE 1.6.4a: Particle diagram for the reaction between copper and oxygen.

Skills Development:
Use particle diagrams to classify substances
Identify an unknown element form its physical and chemical properties
Use experimental results to suggest an order of reactivity of various

Extend to GCSE:

You will learn more about the reactivity series and different types of reactions in GCSE

Explain, using the reactivity series, why K, Li, Na have to be stored in oil.

Chemistry.