

SUBJECT: Science

UNIT: Y8 Metals and nonmetals



Metals and non-metals

Most elements are metals. Metals and non-metals have specific properties.

Metals

Good conductors of electricity & heat

Strong and tough

Shiny when polished

Sonorous

Malleable

Ductile

High melting and boiling point

High density

Can form alloys

Some are magnetic (only three)

Non-metals

Poor conductors of electricity & heat

Not strong or hard-wearing

Dull

Brittle

Low melting and boiling point

Low density

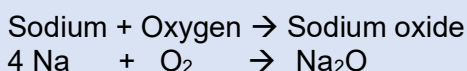
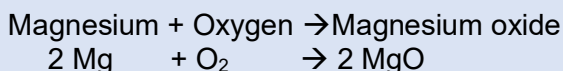
Non-magnetic

There are exceptions to these properties and they apply to most metals and non-metals.

Metal oxides

Compounds are substances made of two or more types of atoms chemically bonded together. All oxides are compounds and contain a single element bonded with oxygen.

When an element reacts with oxygen an oxide is formed, e.g.



Metal oxides are solids. Metal oxides act as bases (pH above 7). This means that they are able to neutralise acids, producing a salt and water.

Non-metal oxides are often gases (CO₂). They dissolve in and react with water, producing acidic solutions.

Ambitious Vocabulary

Sonorous, Malleable, Ductile, conductivity, Brittle, Reactions, conservation.

Chemical reactions

You can have chemical or physical reactions.

Chemical Reactions:

see gases given off- hear fizzing and see bubbles

colour changes

precipitates(solids)

forming temperature changes

Physical Reactions:

Melting- when a substance changes from a solid to a liquid

Evaporating- when a substance changes from a liquid to a gas

Condensing- when a substance changes from a gas to a liquid

Freezing- when a substance changes from a liquid to a solid

Sublimation- when a solid changes to a gas with no liquid phase.

Majority of elements are metals. With 20% of known elements being non-metals. They are located on the left hand side of the periodic table. All metals except Mercury are solid.

Metals and acid

General equation

Metal + acid → metal salt + hydrogen

Sodium + hydrochloric acid → sodium chloride + hydrogen

Metals and water

Metal + water → metal hydroxide + Hydrogen

Lithium + water → lithium hydroxide + hydrogen.

Group 1 metals react readily in water. When placed in water they float on the surface and bubbling is displayed. They get more reactive going down the group.

Displacement reactions

Displacement reactions involve a metal and the compound of a different metal. A more reactive metal will displace a less reactive metal from its compound. The less reactive metal is left uncombined after the reaction. It is no longer chemically bonded to any other elements. It is now a pure element.

