

# Science Knowledge Organiser - Year 5 - Properties and Changes of Materials

## What you should already know

Materials are the substances that things are made from

The properties of materials make them useful for different purposes

Materials have more than one property and can be natural or man-made. Properties can include the hardness, whether it conduct electricity, the shininess, or whether it is magnetic.

There are three main states of matter—solids, liquids and gases

The states of matter of materials can change, through processes such as freezing and melting.



## Grouping materials by properties

PROPERTY	YES	NO
<b>ELECTRICAL CONDUCTOR</b>	Copper, aluminium, gold, silver, steel, sea water	Glass, air, plastic, rubber, wood, oil, diamond
<b>MAGNETIC</b>	Steel, nickel, cobalt, iron, uranium, platinum	Paper, glass, plastic, rubber, wood, wool
<b>TRANSPARENT</b>	Glass, water, clear plastic	Wood, rubber, oil, steel, copper, iron, silver
<b>WATERPROOF</b>	Plastic, rubber, metal, glass	Tissue, sponge, fabric

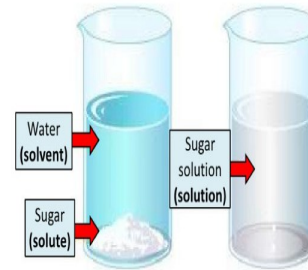
## Solutions and separation

**A solution is a specific type of mixture where one substance is dissolved into another.**

A solvent is a substance that dissolves a solid, liquid or gaseous solute.

A solute is the substance dissolved in the solvent. When it dissolves, it looks as though it has disappeared, but in fact it has been broken down to become part of the liquid e.g. salt water.

Some mixtures and solutions can be separated e.g. through sieving, filtering and evaporating.



## Reversible and irreversible changes

### REVERSIBLE CHANGES



There are many ways in which materials can be changed, for example through heating, cooling or mixing with other substances.

Some changes can be reversed (the material can be returned to its previous form). These are known as reversible changes. E.g. freezing water into ice—it can be melted to return to water.

### IRREVERSIBLE CHANGES



Other changes are irreversible. This means that the changes cannot be 'undone' E.g. cooking, baking, frying, and burning

Changes that involve the formation of new materials (e.g. making cement) are not normally reversible

### Reversible changes

Dissolving

Mixing

Change of state

### Irreversible changes

Burning

Rusting

Decaying

## Key Vocabulary

**Conductor** - A material or device which allows heat or electricity to carry through

**Dissolve** - When something solid mixes with a liquid and becomes part of the liquid

**Evaporation** - The process of turning from liquid to vapour

**Flexible** - Capable of bending easily without breaking

**Gas** - An air-like fluid substance which expands freely to fill any space available

**Insulator** - A substance which does not readily allow the passage of heat or sound

**Irreversible** - Cannot be reversed back to its original state

**Liquid** - A substance that flows freely but can be measured by volume e.g. water or oil

**Magnetic** - Capable of being magnetised or attracted by a magnet

**Material** - The matter from which a thing is or can be made from

**Opaque** - Not able to be seen through, not transparent

**Reversible** - Able to be reversed back to its original state

**Solid** - Firm and stable in shape, not a liquid or fluid

**Soluble** - Able to be dissolved, especially in water

**Thermal** - Relating to heat

**Transparent** - Allows light to pass through so that objects behind can be seen