

Science Knowledge Organiser - Properties and Changes of Materials

How can materials be grouped based on their properties?

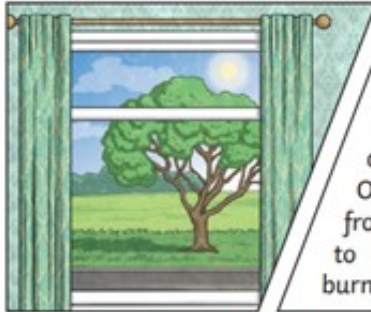
Year 5 - Term 1

Prior knowledge	Key knowledge	Subsequent knowledge
<ul style="list-style-type: none"> Identify and compare the suitability of a variety of everyday materials. (Y2) Find out how the shapes of solid objects can be changed. (Y2) Identify magnetic materials. (Y3) Compare and group materials together as to whether they are solid, liquid or gas. (Y4) Observe that some materials change state when they are heated or cooled. (Y4) Evaporation and condensation. (Y4) 	<ul style="list-style-type: none"> A solution is made by dissolving a material in a liquid. Filtering, sieving and evaporating are 3 ways mixtures can be separated. I know that some changes to materials are reversible or irreversible. 	<ul style="list-style-type: none"> Chemical reactions as the rearrangement of atoms. (KS3) Representing chemical reactions using formulae and using equations. (KS3) Combustion, thermal decomposition, oxidation and displacement reactions. (KS3) Defining acids and alkalis in terms of neutralisation reactions. (KS3) The pH scale for measuring acidity/alkalinity; and indicators. (KS3)

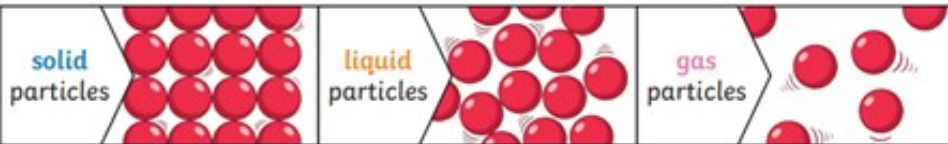
Vocabulary	Meaning
Solids	Solid particles are very close together, meaning solids, such as wood and glass, hold their shape.
Liquid	This state of matter can flow and take the shape of the container because the particles are more loosely packed than solids and can move around each other. Examples of liquids include water and milk.
Gas	One of the three states of matter. Gas particles are further apart than solid or liquid particles and they are free to move around. A gas fills its container, taking both the shape and the volume of the container. Examples of gases are oxygen and helium.
Conductor	A conductor is a material that heat or electricity can easily travel through. Most metals are both thermal conductors (they conduct heat) and electrical conductors (they conduct electricity).
Insulator	An insulator is a material that does not let heat or electricity travel through them. Wood and plastic are both thermal and electrical insulators.
Reversible	If you can get back the substances you started the reaction with, that's a reversible reaction.
Irreversible	A change is called irreversible if it cannot be changed back again. In an irreversible change, new materials are always formed.
Soluble	A substance able to be dissolved.
Insoluble	A substance which cannot be dissolved.

Key Knowledge

Different **materials** are used for particular jobs based on their properties: electrical **conductivity**, flexibility, hardness, **insulators**, magnetism, solubility, thermal **conductivity**, **transparency**.



For example, glass is used for windows because it is hard and **transparent**. Oven gloves are made from a thermal **insulator** to keep the heat from burning your hand.



solid particles

liquid particles

gas particles



Irreversible changes often result in a new product being made from the old **materials** (reactants). For example, burning wood produces ash. Mixing vinegar and milk produces casein plastic.



Key Knowledge

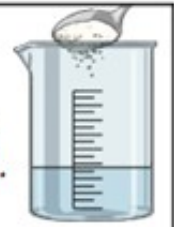
Reversible changes, such as mixing and dissolving **solids** and **liquids** together, can be reversed by:

<p>1</p> <p>Smaller materials are able to fall through the holes in the sieve, separating them from larger particles.</p>	<p>Filtering</p> <p>The solid particles will get caught in the filter paper but the liquid will be able to get through.</p>	<p>Evaporating</p> <p>The liquid changes into a gas, leaving the solid particles behind.</p>
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Dissolving

A solution is made when **solid** particles are mixed with **liquid** particles. **Materials** that will dissolve are known as soluble. **Materials** that won't dissolve are known as insoluble. A suspension is when the particles don't dissolve.

Sugar is a soluble **material**.



Sand is an insoluble **material**.

