

UKS2 Knowledge Organiser Science: Properties and Changes of Materials

Key knowledge

Different materials are used for particular jobs based on their properties:

Electrical conductivity **Flexibility** **Hardness**
Insulator **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 hands



Reversible and Irreversible Changes

Reversible

Dissolving water in sugar
 Freezing water
 Melting chocolate

Toasting bread is irreversible: once it is toasted it can't go back to being untoasted

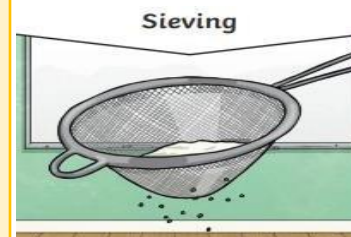
Irreversible

Toasting bread
 Cooking a cake
 A candle melting



Separating materials

Sieving: Smaller materials are able to fall through the holes in the sieve, separating them from the larger particles.



Filtering: the solid particles will get caught in the filter paper but the liquid will be able to get through.

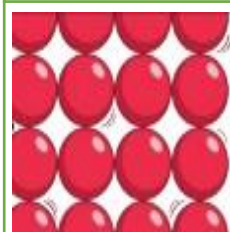


Evaporating the liquid changes into a gas, leaving the solid particles behind.



Particle Arrangement-prior knowledge

Solid – particles are packed closely together



Liquid – particles have some space to move



Gas – particles are free to move



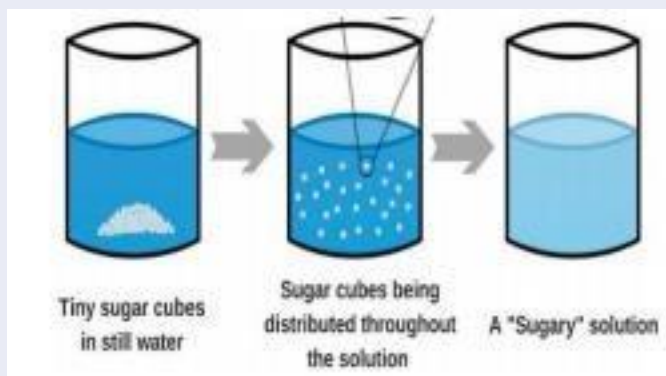
Key Vocab

Soluble	Able to be dissolved, especially in water
Insoluble	Cannot be dissolved, especially in water
Dissolve	When something solid mixes with a liquid and becomes part of the liquid
Solution	A solution is made when one substance dissolves into another
Reversible change	Can be reversed back to its original state
Irreversible change	Cannot be reversed back to its original state
Transparent	Allows light to pass through
Thermal conductor	A material or device which allows heat to carry through
Electrical conductor	A material or device with allows electricity to carry through
Electrical Insulator	Does not allow electricity to pass through it.
Magnetic	Capable of being magnetised or attracted by a magnet
Evaporation	The process of liquid heating and changing into a gas
Filter	Separates an insoluble solid that is mixed in a liquid.
Sieve	Separates solids of different sizes

Dissolving

A **solution** is made when solid particles are mixed with liquid particles e.g. dissolving sugar in hot tea. The solid seems to disappear in the solution but it is still there – it has just become part of the liquid.

Materials that will dissolve are known as **soluble**.



Materials that won't dissolve are known as **insoluble**.

Sand is an insoluble material



The bubbles are made from a gas called carbon dioxide. Carbon dioxide is a gas that is all around us. We produce carbon dioxide when we breathe.

Fizzy drinks are made by adding carbon dioxide to liquid under huge pressure. The carbon dioxide dissolves in the liquid and settles in the space above the liquid in the bottle or can. When the container is opened, the pressure decreases and the gas escapes quickly, making a hissing sound. The bubbles appear as the carbon dioxide turns into gas.



Changes of State

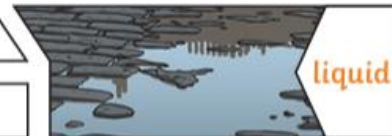
solid



The **solid** melts.

The **liquid** freezes.

liquid



liquid



The **gas** condenses.

The **liquid** evaporates.

gas

