

Materials and their Properties

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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.



Reversible and Irreversible Changes

Reversible	Irreversible
Dissolving water in sugar Freezing water Melting chocolate	Toasting bread Cooking a cake A candle melting

Particle Arrangement

Solid – particles are packed closely together	Liquid – particles have some space to move	Gas – particles are free to move

Key Vocabulary	
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
Thermal Insulator	Does not allow heat to pass through it.
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

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.



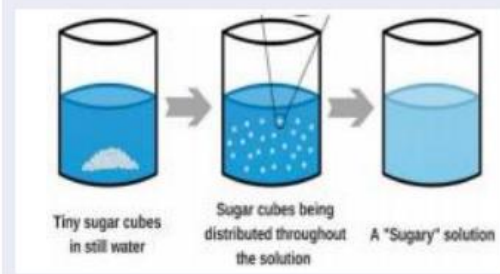
Oven gloves are made from a **thermal insulator** to keep the heat from burning your hands



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**.

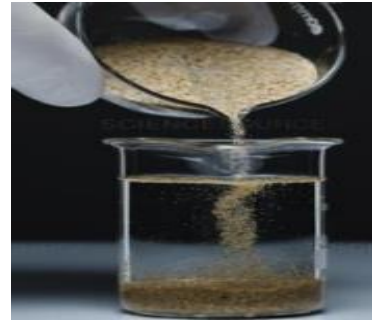


Whilst working at 3M Company, Spencer Silver was trying to make a very strong adhesive to be used in building planes. Instead, he managed to create a very weak adhesive that could be peeled off and re-used. At the time, Silver could not think of a use for this weak adhesive.

Many years later, Silver's colleague Art Fry, who sang in a local choir, kept losing the bookmarks in his hymn book. A eureka moment resulted in making an association between Silver's weak glue and his bookmarks falling out. The idea of Post-It notes was created.

Insoluble

Materials that won't dissolve are known as insoluble.



Read more: Amazing Materials: Solids, liquids and gases
Research more:
<https://explorify.wellcome.ac.uk/en/activities/whats-going-on/shaking-sensation>