

**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

**Irreversible**

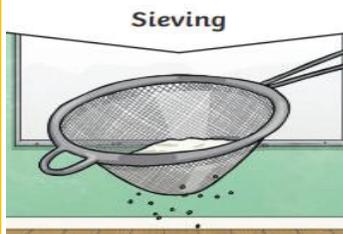
- Toasting bread
- Cooking a cake
- A candle melting

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



**Separating materials**

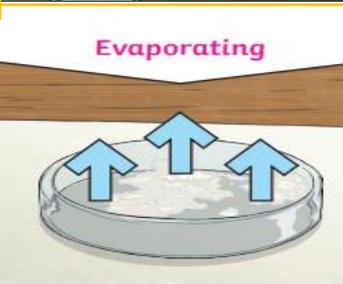
**Sieving:** Smaller materials are able to fall through the holes in the sieve, separating them from the larger particles.



**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.

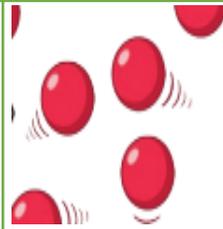
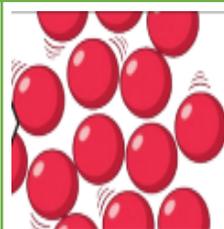
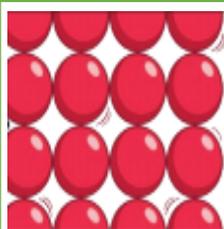


**Particle Arrangement**

Solid – particles are packed closely together

Liquid – particles have some space to move

Gas – particles are free to move



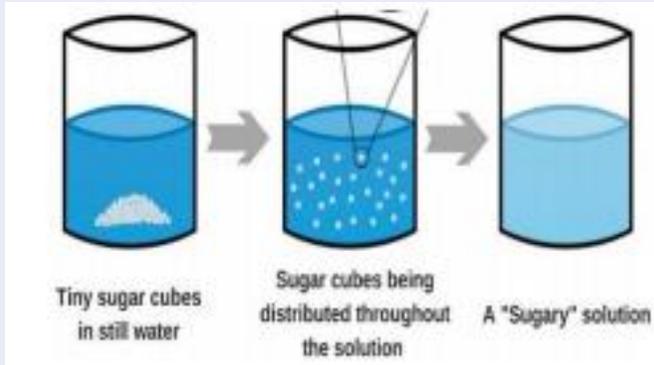
**Key Vocab**

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



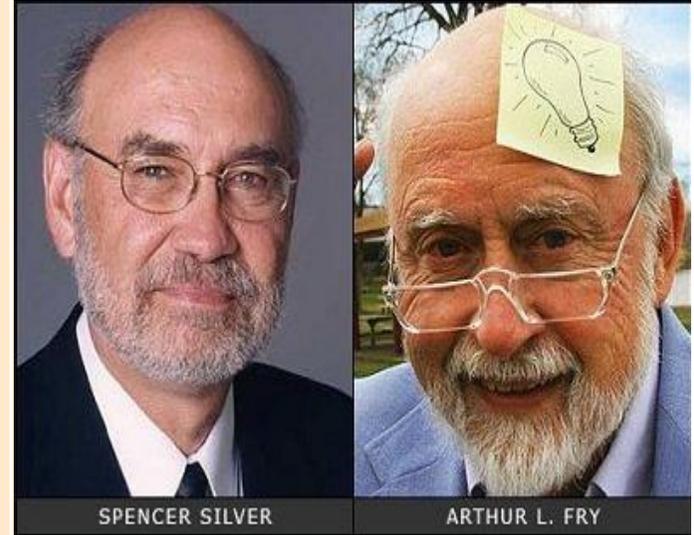
Sand is an insoluble material



## Spencer Silver, chemist

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.



### Guinness Book of World Records

The most sticky notes stuck on the face in 30 seconds is 38 and was achieved by Silvio Sabba in Milan, Italy, on 18 April 2018.

