

Separating Mixtures

LO: To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating

Success Criteria

- I can identify different ways materials can be mixed together.
- I can use sieving, filtering, evaporating and other processes to separate mixtures of materials.
- I know when to use which processes to separate mixtures.

Reversible and Irreversible Changes

Create a definition for reversible and irreversible changes with your partner. Move the box below to see if you're correct!

Irreversible changes, like burning, cannot be undone.

- E.g. baking a cake- you cannot get the eggs back once they are baked into the cake.

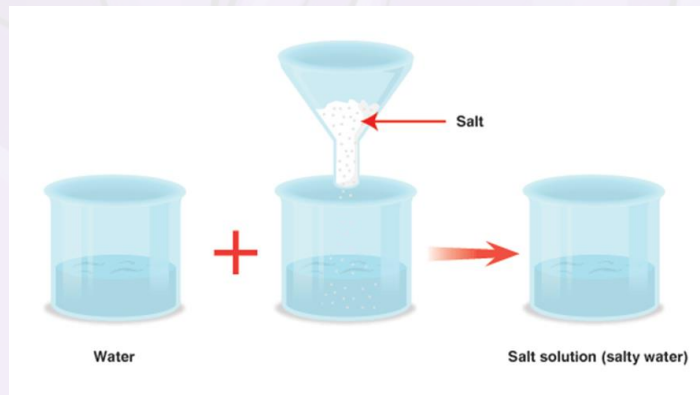
Reversible changes, like melting and dissolving, can be changed back again.

- E.g. melting ice cubes, you can freeze them back again.

What is dissolving?

Some substances dissolve when you mix them with water. When a substance dissolves, it looks like it disappears. But in fact it has just mixed with the water to make a transparent (see-through) liquid called a solution.

When you mix sugar with water, the sugar dissolves to make a transparent solution. Water is a solvent and the mixture (the sugar) which dissolves is called a solute.

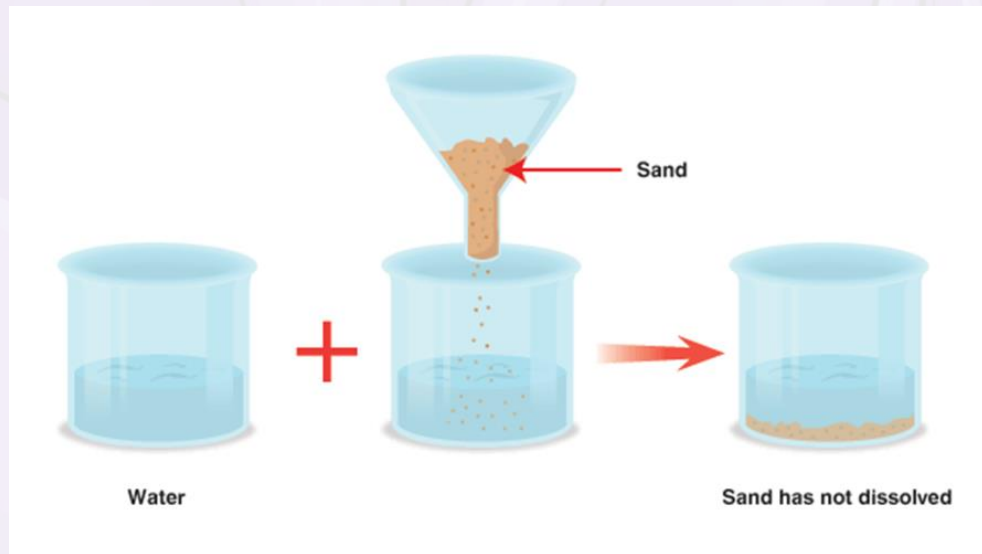


Substances that dissolve in water are called **soluble** substances.

Substances that **do not** dissolve in water are called **insoluble** substances.

When you mix sand or flour with water, they do not dissolve.

Can you name 5 soluble substances?



Separating Mixtures

There are four scientific ways of separating mixtures.

The 'right' one depends on what you are separating.

Magnetism- Using a magnetic to attract metal materials.

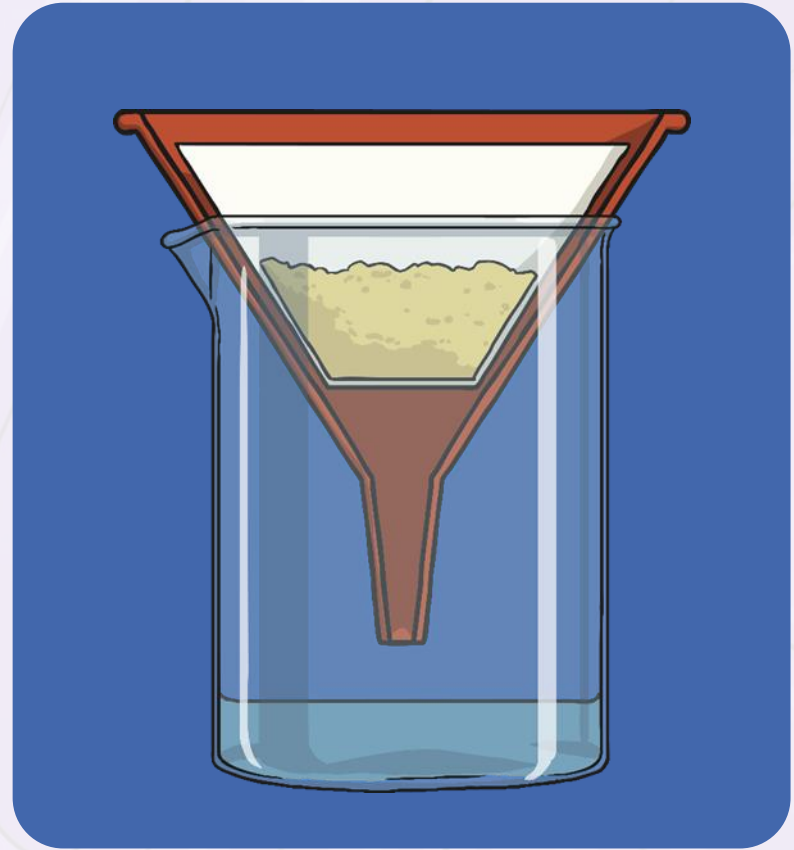
Filtration - Using a filter paper to block some solid material, whilst letting liquid through.

Sieving - Using very small holes to stop most solids but letting through powders (miniscule solids).

Evaporation/Condensation - Boiling solute liquid (water with stuff dissolved in it) and catching the water on a cold surface.

Filtration

The art of filtration was known to early humans, who obtained clear water from a muddy river by scooping a hole in the sand on a river bank to a depth below the river water level. Clear water filtered by the sand would trickle into the hole. The same process on a larger scale and with refinements is commonly used to purify water for cities still today! You can use filter paper to retain any solid particles and the liquid will pass through into a beaker beneath.



Sieving

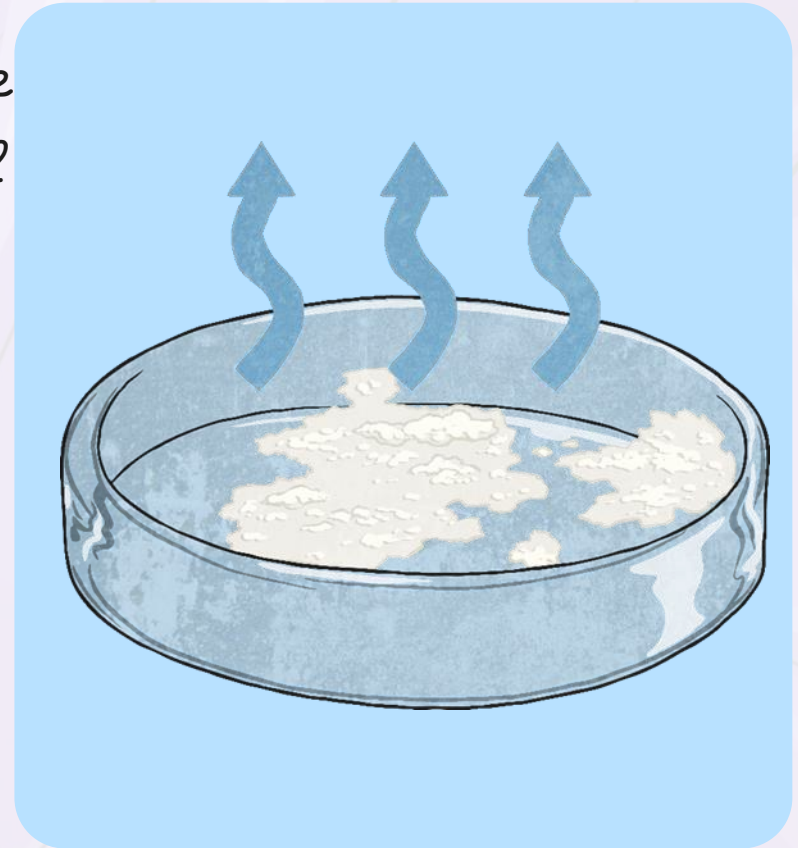
Sieving is a separating process that is used to remove particles of insoluble or undissolved material from a liquid, usually by using a barrier with small to medium-sized holes.

It is similar to filtering! Sieving can also be used to separate fine materials from thicker materials that can't fit through the tiny holes of the sieve for example separating salt and raisins as raisins won't fall through the small holes of the sieve! We use sieving all the time when we cook, for example pouring rice or pasta and sieve out the water! Archaeologists use sieving to sieve out dirt yet can find tiny pieces of artefacts like broken pieces of a pot!"



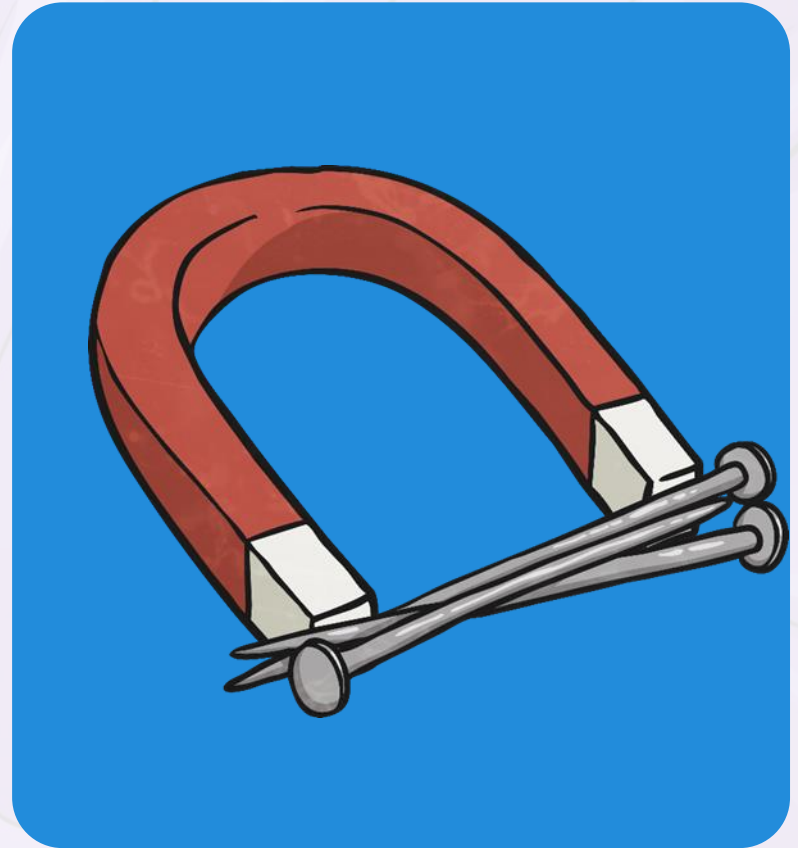
Evaporation

Evaporation is the process by which water changes from a liquid to a gas or vapour due to being heated. For example if a salt solution was boiled in a pan, the water would evaporate and become steam and leave behind the salt! An example of evaporation is when muddy puddles on the playground disappear in the sunshine, leaving the mud behind.



Magnetism

Magnetic separation is the process of separating components of mixtures by using magnets to attract magnetic materials. The process that is used for magnetic separation detaches non-magnetic material with those that are magnetic. This process is often used at landfills where metals are retrieved for recycling.



For today's task you are going to separate solutions using the correct separation technique that you chose last week.



Salt and Water



Sand and Water



Paper Clips and Rice



Raisins and Flour

Use your sheet from last week to help you.

L.O: To use knowledge of solids, liquids and gases to decide how mixtures might be separated, including through filtering, sieving and evaporating

	Evaporation	Filtration	Magnetism	Sieving
Materials	Separation Technique			Diagram
Sand and Water				
Raisins and Flour				
Salt and Water				
Paper Clips and Rice				

To separate the materials I will use the
technique because

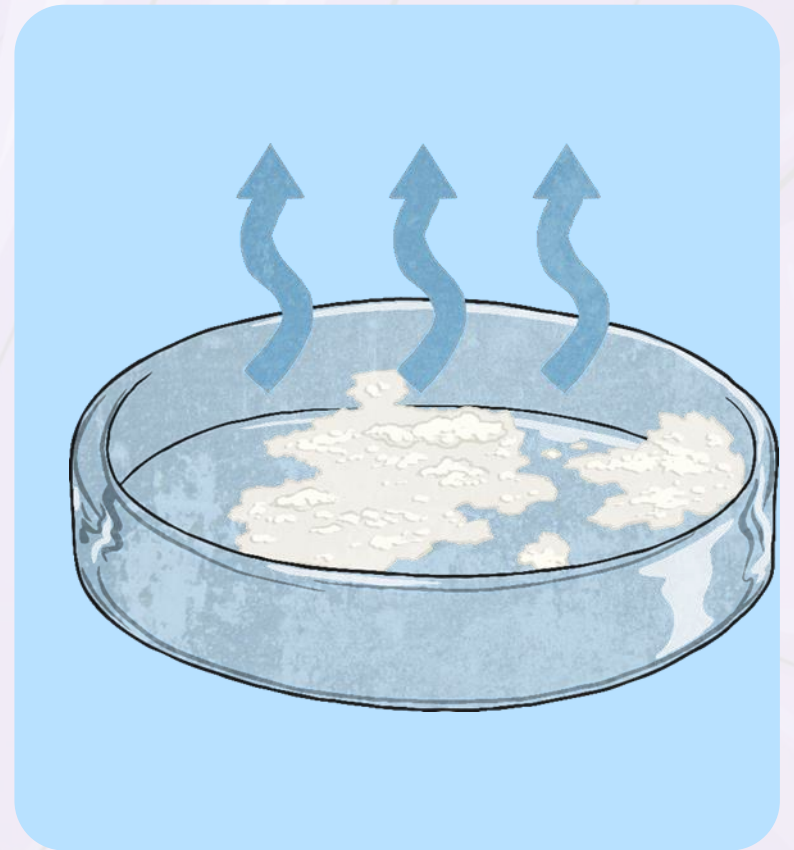
Which separation techniques did you think would be best for each mixture?

Separating Processes - Evaporation

As the salt has dissolved in the water, filtering would not separate the two materials. The salt particles would go through the filter paper along with the water.

When the salt water solution is evaporated, the water will turn into water vapour and leave the salt behind.

https://www.youtube.com/watch?v=p3MB_M3NbvY

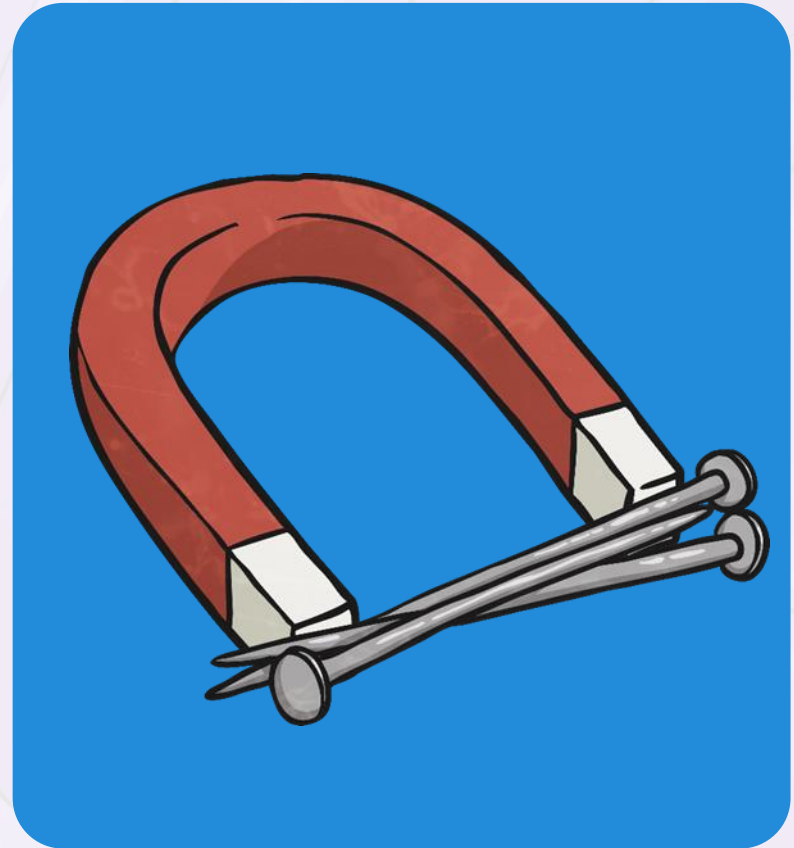


Separating Processes - Magnetic Attraction

Use this process to separate the paper clips from the rice.

The paper clips are made of steel and will be attracted to the magnet.

The rice is not magnetic so will stay in the bowl

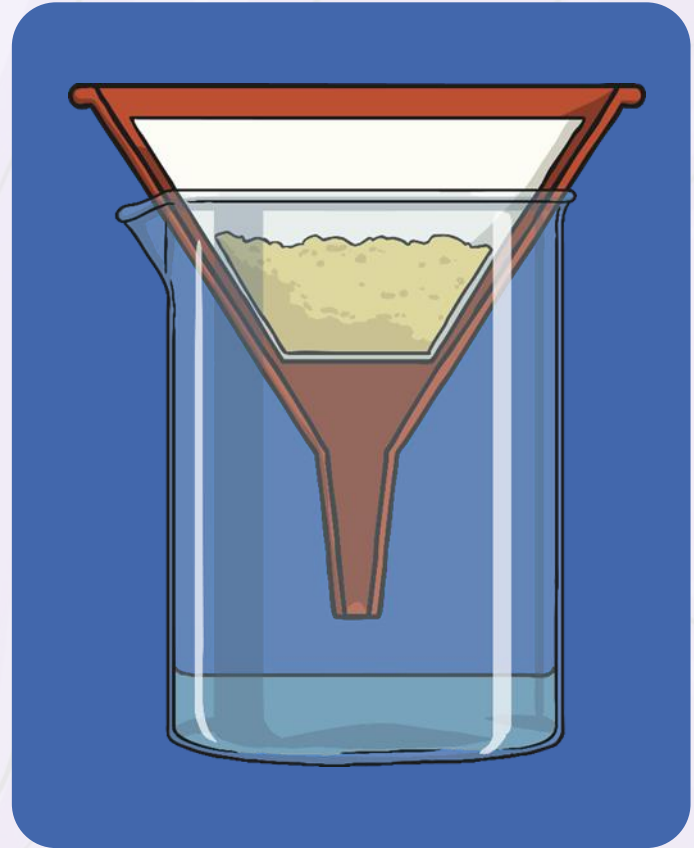


Separating Processes - Filtration

This process should be used to separate the mixture of sand and water.

Sand is insoluble, so it has not dissolved in the water. The sand particles will not be able to get through the tiny holes in the filter paper, but the water particles will.

The sand will be caught in the filter paper while the water will get through to the bowl.

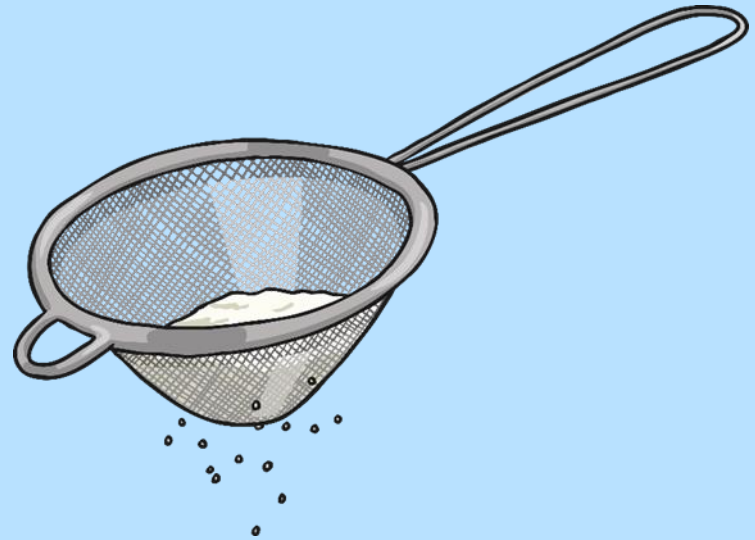


Separating Processes - Sieving

Use this process to separate the mixture of raisins and flour.

The grains of flour are much smaller than the raisins, so they will be able to go through the sieve into the bowl below.

The raisins are much bigger, and will get caught in the sieve.



Main Task

Complete the evidence sheet.

I chose the correct/incorrect separation technique for the mixtures tested.

I found out.....

