Separating mixtures

Watch the link to get a good understanding of separating mixtures.

Separating mixtures of materials - KS2 Science - BBC Bitesize

Key words- soluble / insoluble

Task 1 Match the description (1, 2, 3, 4) to the mixed materials (A, B, C, D).

Mixed Materials

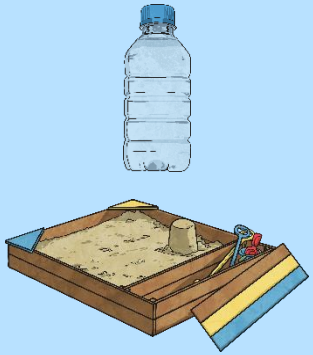
1. A suspension - a mixture of a liquid and solid particles that will not dissolve.

2. A mixture of two solids.

3. A solution - a solid dissolved in a liquid.

4. A mixture of two solids.

A. Sand and water.



B. Raisins and flour.

C. Paper clips and rice.

D. Salt and water.

Mixed Materials

How did you do?

1. A suspension - a mixture of a liquid and solid particles that will not dissolve.

A. Sand and water.

2. A mixture of two solids.

B. Raisins and flour.

3. A solution - a solid dissolved in a liquid.

D. Salt and water.

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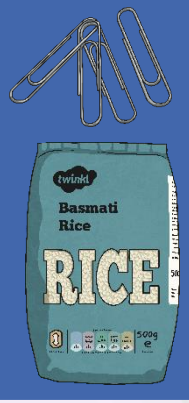
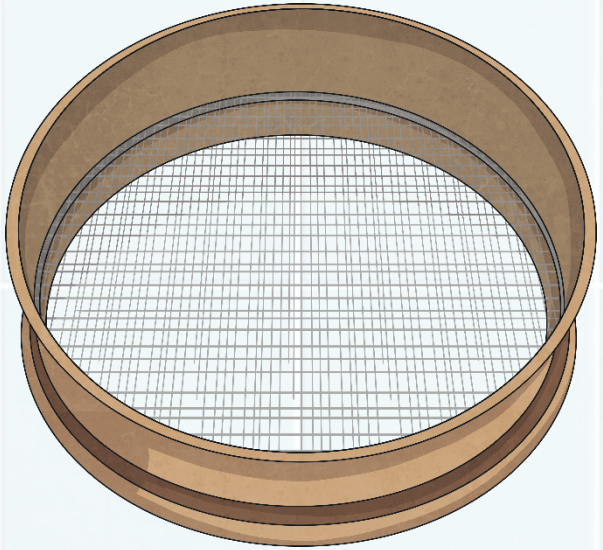
C. Paper clips and rice.



Processes to Separate Mixtures

When some materials are mixed together, it is possible to separate the mixture and get the original materials back again.

There are several different ways of separating mixtures.
The best process to use depends on the type of mixture you are separating.



Evaporation and Condensation

Magnetism

Filtering

Sieving

Decanting

Evaporation and Condensation

1. This process is best used to separate solutions - mixtures in which a solid has dissolved in a liquid.

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

3. When the solution is evaporated, either through boiling or by being left in a warm place, the liquid will turn into gas and leave the solid behind.

4. If the gas is then condensed on a cool surface, the liquid can be recovered and collected too. Examples of mixtures to separate with this process include salt and water or sugar and water

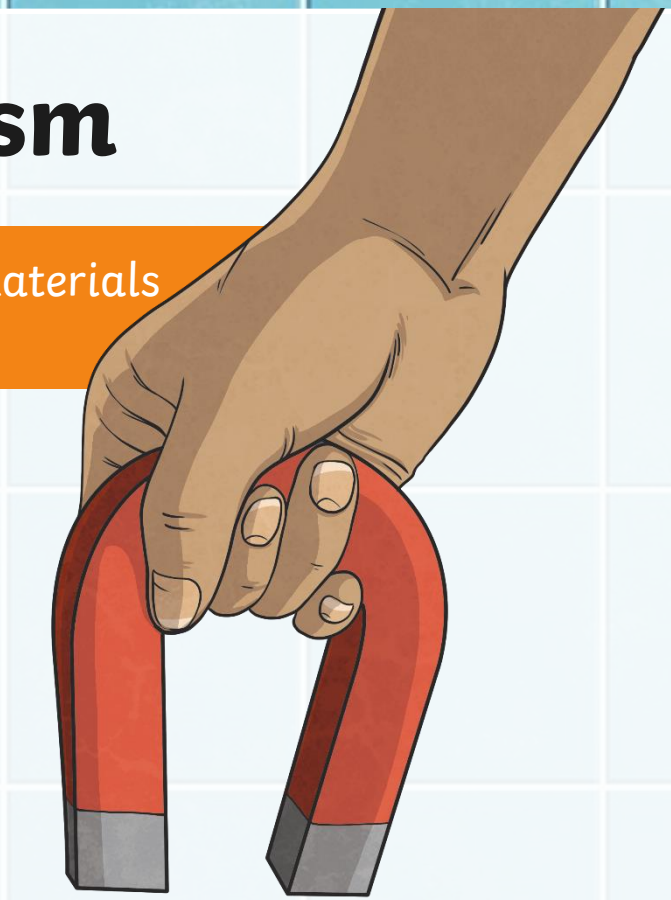
Processes

Magnetism

You use this process to separate magnetic materials from non-magnetic materials.

A magnet is used to attract any magnetic materials and remove them from the mixture.

You could separate a mixture of copper nails and iron nails using this process.



Processes

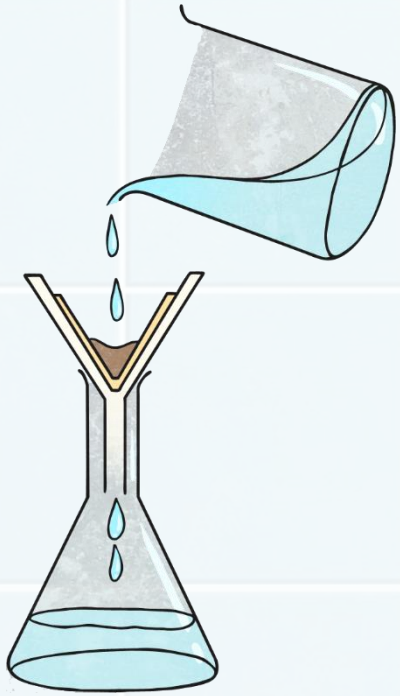
Filtering

This process should be used to separate a mixture of an insoluble solid and a liquid.
A funnel is lined with filter paper and placed over a beaker.
The mixture is poured slowly into the filter paper.

Insoluble solids will not have dissolved in the liquid. The solid particles will not be able to get through the tiny holes in the filter paper, and will be caught in it.

The liquid particles will go through the filter paper into the beaker below.

This process could be used to separate a mixture of sand and water



Processes

Sieving

You can use this process to separate a mixture of different sized solids.

The mixture is poured into a sieve held over a bowl.

The smaller particles will get through it into the bowl and the larger particles will be caught in the sieve.

Mixtures you could separate using this process include raisins and flour, or rice and pasta.

Processes

Decanting

This process can be used to separate two liquids that have different densities.

The mixture of liquids is left to settle, so the two liquids are visible as two different layers.

The less dense liquid will be the top layer, and this can be decanted, or slowly poured off.

This process could be used to separate a mixture of oil and water.

Processes

Task 2

Can you try any of these processes at home?

You must ask an adult when doing this!

Task 3

Match the process with the description

Evaporating and Condensing	Separates insoluble solids from liquids
Decanting	Separates two liquids which have different weights
Magnetism	Separates different sized solids
Filtering	Separates soluble solids from liquids
Sieving	Separates iron and steel from non magnetic materials

Task 4

Use the information in the previous slides to help you think of which process would be best to separate each mixture.

Mixture	Process
salt + water	
sugar + water	
rice + pasta shapes	
sand + water	
flour + rice	
paperclips + sawdust	

Watch this video about dissolving

What is dissolving? - BBC Bitesize

Dissolving

Sometimes solids dissolve in a liquid (evaporation and condensation would be the best process to separate out this mixture) **but what is dissolving?**

What happens when salt dissolves?

- Salt is made of sodium (Na) (a metal) and chlorine (Cl).
- In water the sodium and chlorine are split up.
- They are "hidden" by the water.

You could have a go at dissolving salt into water... look at the next slide for ideas of what you could investigate

Dissolving

Different ideas that you could investigate:

- How much salt can dissolve in a certain amount of water?
- Does the temperature of water effect the amount that dissolves?
- Does the amount of water effect the amount of salt that dissolves?
- What powders dissolve in water? Do they change the colour of the liquid? (think spices etc)
- I'm sure you can think of even more!
- Can you dissolve more salt or sugar in the same amount of water?

If investigating, you could think of how you could make your investigation a fair test →

What conditions cause more solid to dissolve?

What you will change?

- the temperature of the water

What you will measure/ observe?

- how much salt or sugar had dissolved

What you will keep the same?

- the amount of water
- the amount of salt or sugar
- the number of stirs (if any)