Science

Materials and their properties

Mixtures and Solutions

What is a Mixture?

- A **mixture** is a substance in which two or more substances are mixed but not chemically joined together, meaning that a chemical reaction has not taken place.
- Mixtures can be easily separated and the substances in the mixture keep their original properties.
- Imagine mixing skittles and full size marshmallows, the individual components (skittles and marshmallows) could easily be separated using a filter and each component of the mixture (skittles and marshmallow) doesn't change.

How to make a mixture

You can make your own mixtures with items from around the house.

1. Firstly try to make a mixture of toys.

2. This time use cereals or sweets.

If you separate these **mixtures**, you end up with your items in their original state.

WHAT IS A SOLUTION?

- A solution is made when a solid (which we call a solute) dissolves into a liquid (that we call the solvent)
- One example of a solution is salt dissolved in water. The salt and water can be separated again by evaporation (the water will evaporate if left in a hot place leaving the salt behind).

Investigation

- Test out these three mixtures to see which form solutions (the solid dissolves in the liquid) and which don't:

  Salt and Water

  Sugar and Water

  Sand and Water

- Prediction: Which of the solids do you think will dissolve? Why?
- Method: Add a spoonful of salt to a clear glass of water and stir for a few moments. Observe what happens to the mixture.
- Repeat with the other two mixtures.
- Think about how to make your investigation **fair** (what will you keep the same?)

RECORDING YOUR OBSERVATIONS

Test	Observations	Forms a solution Yes or No?
Salt and Water		
Sugar and Water		
Sand and Water		

WHAT DID YOU FIND OUT?

- You should find that both salt and sugar dissolve in the water and form solutions. They are **soluble**. Sand sinks to bottom because it is **insoluble.**

- During dissolving, particles of solvent (the liquid) collide with particles of solute (the solid). They surround the particles of solute, gradually moving them away until the particles are evenly spread through the solvent to form a solution.

- It appears that the solid has disappeared but it has not – it is being hidden by the solvent.

- What other solids could you test in the same way?

  (Coffee? Tea leaves? Pepper?)

HOW DO YOU SEPARATE MIXTURES?

- Can you separate the components out of the mixture again?

- Hint – to separate the sand from water you could use a sieve. This is possible as the sand is insoluble (doesn't dissolve in water).
- Salt and sugar are soluble (dissolve in water) and can be separated by evaporation.