Separating solutions

Outstanding Science Year 5 - Properties and changes of materials - OS5C004

National Curriculum Statutory Requirements
5C2 - know that some materials will dissolve in liquid to form a solution, and describe how to recover a substance from a solution; **UKS2W2** - taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate; **UKS2W3** - recording data and results of increasing complexity using scientific diagrams and labels, classification keys, tables, scatter graphs, bar and line graphs;

Learning Objective
I can explain how to recover a substance from a solution.

Me: Teacher:

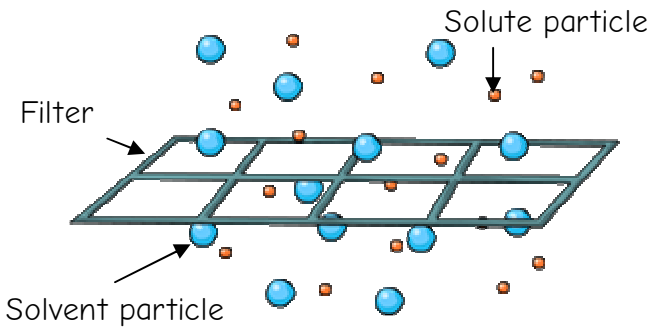
Dissolving

Some materials **dissolve** in water. This means that they break apart into tiny pieces and spread throughout the water, so that they can no longer be seen. The material which dissolves is called a **solute**. Water is a **solvent**, and the mixture of water and material is called a **solution**.

Separating mixtures

Some mixtures can be separated using a **filter** or **sieve**. Filters and sieves have holes which allow small pieces to pass through, but prevent large pieces from passing through. A sieve can be used to separate sand and pebbles. The sand passes through the sieve, while the pebbles remain on top. However, **filtering does not work with solutions**. The pieces of solute are **too small** to be stopped by a sieve or filter.

The filter cannot separate the solution into solvent and solute because both types of particles can easily pass through the holes in the filter without being stopped.



Separating solutions

Water solutions can be separated by **evaporation**. The water can be made to evaporate over time, leaving the **solute** behind.

Scientific question

Where is the best place to place a cup of salt water solution so that the water evaporates most quickly?

You will need:

- Water
- A large jug
- Salt
- 4 small measuring jugs (marked in ml)

Method

Fill the jug with water and stir in some salt to produce a salt water solution. Add 100ml of water to each of the small measuring jugs. Place the jugs in 4 different (safe) locations of your choosing. Predict the location where the water will evaporate most quickly. Every day, for 7 days, measure how much solution remains in each jug and record on the table. It does not matter if you do not measure at the weekend - the results will still be useful.

Results

At the end of the investigation, complete the line graph using your results. Your graph will have 4 lines - one for each cup.

Outstanding Science

Fair testing

This is the **variable** - the one thing that we are changing:

We are trying to keep everything else the same, including:

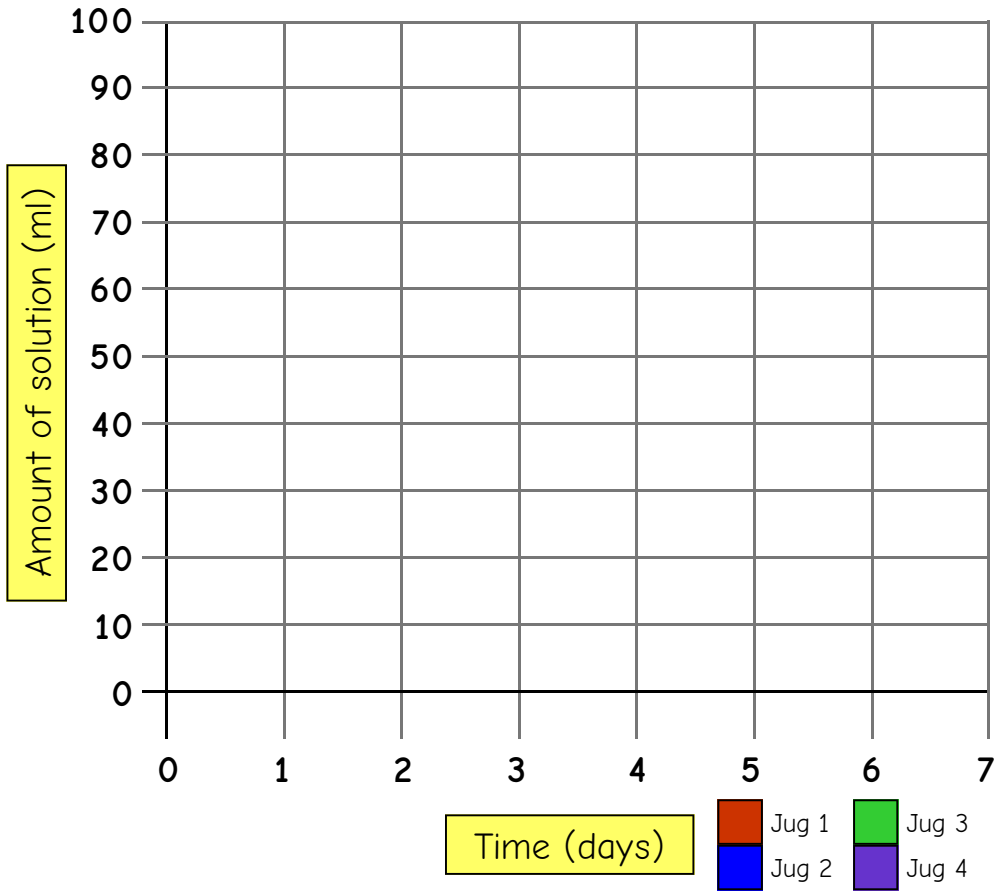
Measurement

This is what we are measuring:

Table showing the amount of salt solution (ml) in 4 measuring jugs over 7 days

		Amount of solution (ml)						
Jug	**Location**	**0**	**1**	**2**	**3**	**4**	**5**	**7**
1								
2								
3								
4								

Line graph showing the amount of salt solution (ml) in 4 measuring jugs over 7 days



Discussion

How accurate was your prediction?
Are your results the same as those of the other children?
What happened to the water? Did it disappear?
Which was the best location to place a cup so that the water would evaporate? Which was the worst location? Why?
Can you explain how this method for separating solutions works?