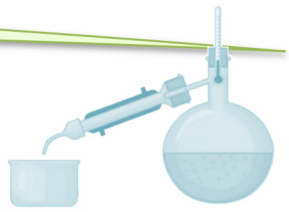
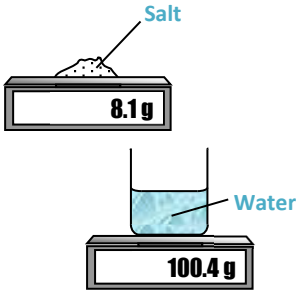
Practical Alternatives

Mass Conservation

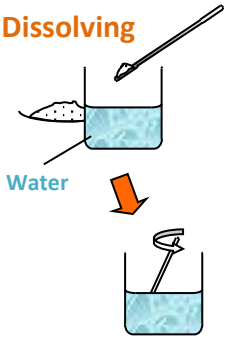


A teacher demonstrated an experiment to prove that mass is conserved. This means that even if a substance is dissolved or evaporated then its mass remains the same. The experiment is shown below.

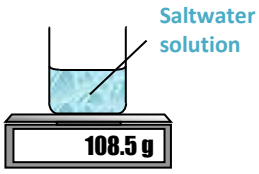
1. Weighing



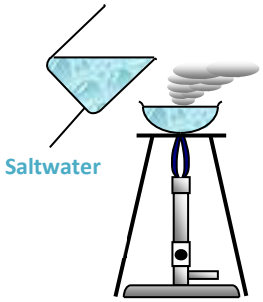
2. Dissolving



3. Weighing the solution

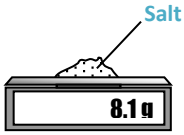


4. Evaporating



5. Drying

6. Weighing the salt



Fact File

If one substance dissolves in another, a *solution* is formed.

The substance that is being dissolved is called the *solute*.

The solute dissolves in a liquid called the *solvent*.

When a solute dissolves, mass is conserved. This means that the mass of the solution is equal to the mass of the solute plus the mass of the solvent.

Separating the solute from the solvent also leaves the mass unaffected.

Tasks

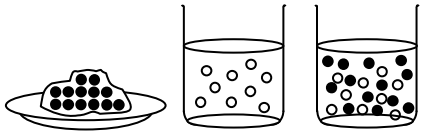
1. Label the following apparatus in the diagrams above (use each label once).

Balance *Spatula* *Beaker* *Stirring rod*
Bunsen *Tripod* *Evaporating basin* *Filter paper*

2. Write a full account of this activity. Include the names of all the apparatus used.

3. What conclusions can you make from this experiment?

4. The diagrams on the right give an idea of how the particles exist in the salt, the water and saltwater solution. Describe the arrangement of particles in each case.



5. Use the particle theory to explain why mass was conserved in this experiment.

Key Words

Conservation. Particles. Solute. Solvent. Solution.

☑ Checklist for this activity

☐ Work on the sheet/in the file ☐ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5
☐ Write full answers ☐ Copy the *Fact File*
☐ Copy the diagrams ☐ Add your own research

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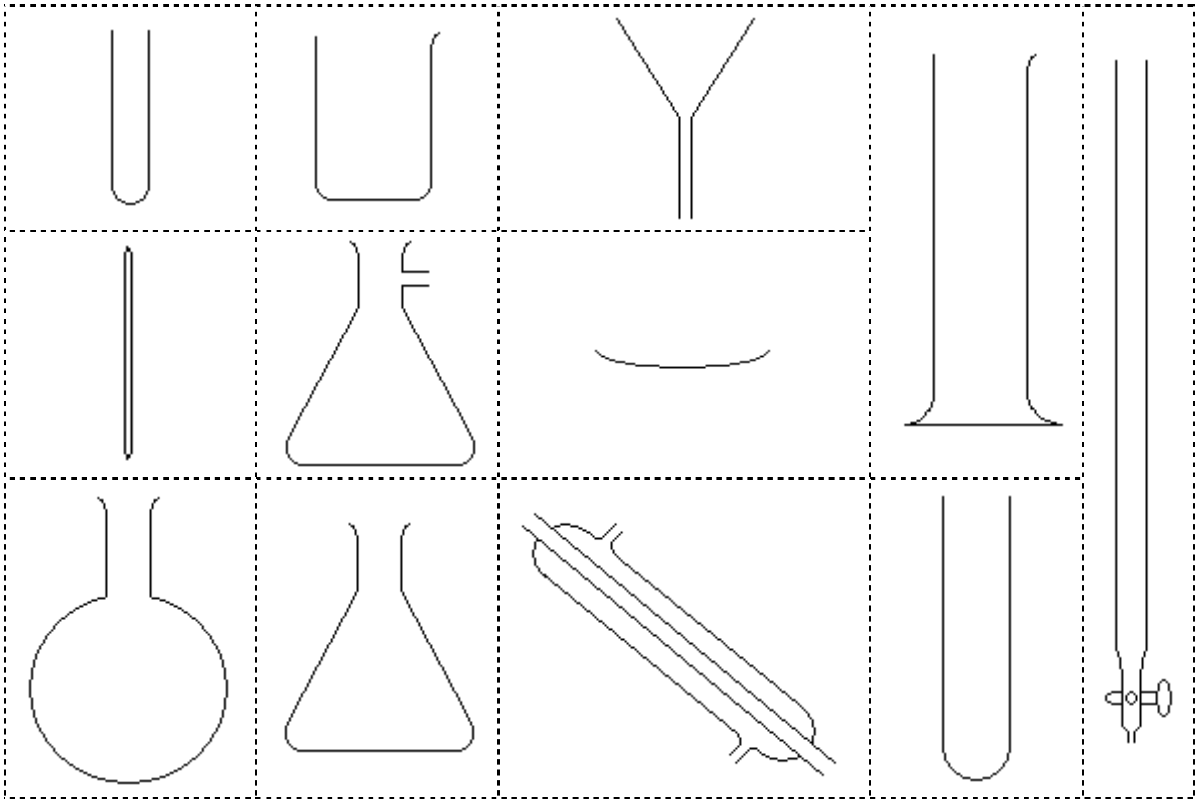
Cut'n'Stick

Glassware

Cut out and match the diagrams with the labels.

Extension

Practice drawing the diagrams as they are shown below. Notice that cross sections are used so that you can see where the openings are.



Test tube	Stirring rod	Side-arm flask
Burette	Filter funnel	Evaporating basin
Beaker	Conical flask	Measuring cylinder
Condenser	Boiling tube	Round-bottom flask

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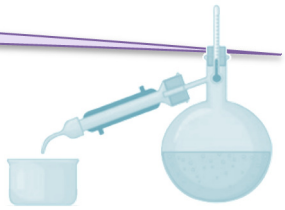
Plenaries

Rock Salt



Rock Salt						
insoluble	*pure*	*filtration*	*dissolves*	*evaporate*	*separate*	*residue*

Rock salt is a mixture of salt and various _____ impurities. If we stir rock salt into water, the salt _____ but the impurities do not. We can then _____ the salt water from the impurities using _____ (the impurities are left behind as a _____ in the filter paper). We can then _____ off the water leaving a sample of _____ salt behind.

Rock Salt						
insoluble	*pure*	*filtration*	*dissolves*	*evaporate*	*separate*	*residue*

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Practical Tasks

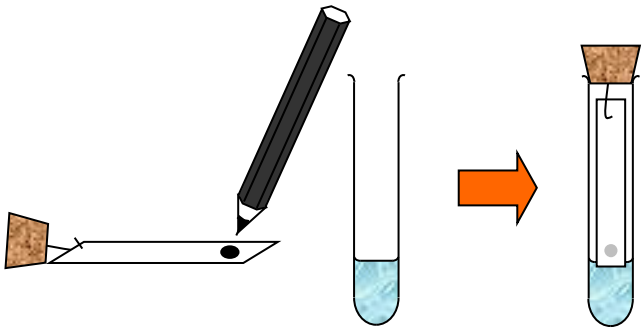
Chromatography

Hypothesis The ink in a coloured pen is usually a mixture of dyes. We can separate these dyes because each has a different solubility. The process of separation is called chromatography.

Apparatus

Method

Diagram (label and complete)



Results

Dyes in Ink	Results (glue in)

Conclusion

Which coloured dye was the most soluble in water?

Which was the least soluble?

Evaluation

How well did the experiment work?

How could you separate dyes that are not soluble in water?

How could you find out which dyes have been used to create different coloured smarties?

Some ink from a black marker pen has been found at a crime scene. How could a police investigator compare the ink with pens found in a suspect's home?

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