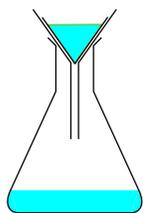


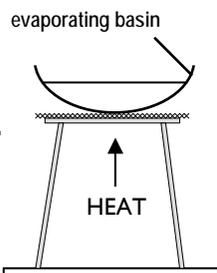
SEPARATION TECHNIQUES

Separation techniques. The separation of substances depends on differences in their physical properties; for example, one solid may be soluble and the other insoluble.

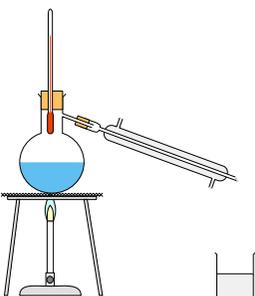
FILTERING: separate soluble substance from an insoluble substance eg sand (insoluble) from salt (soluble in water). Technique uses a filter paper and funnel, to separate insoluble materials from a liquid. The liquid that collects in the flask is called the filtrate. The insoluble solid on the filter paper is called the residue.



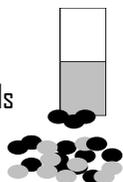
EVAPORATING: heat a solution - the water evaporates - the solid is left behind in the evaporating basin eg get salt from salty water.



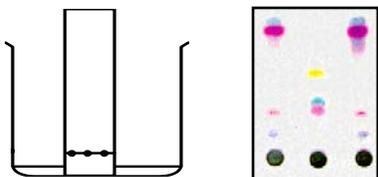
DISTILLATION: The process of separating a liquid from a solution by evaporating the liquid and then condensing it. The liquid collected is called the distillate. Eg get water from blue ink, or water from salty water.



MAGNETIC SEPARATION: Process of separating magnetic iron from non magnetic materials.



CHROMATOGRAPHY - Separating dissolved solids from one another eg colours in an ink.



GLOSSARY

Aim - Purpose of experiment.

Apparatus - The gear eg Bunsen, beaker.

Average - The mean of numbers – calculated by adding numbers together and dividing by how many pieces of data you had.

Conclusion - What you found out from the experiment.

Condensation - Water droplets when water vapour turns to water.

Condense – a gas turning to liquid.

Crystal - Regularly shaped solid, with flat faces.

Data - Results, numerical results.

Decant - Pour off a liquid and leave a solid behind.

Diagram - Labelled picture, usually 2D of science apparatus .

Dissolve - Solid splits up and mixes with a liquid to make a solution.

Equipment - The apparatus, gear, eg Bunsen, beaker, test tube.

Evaporate / evaporation – Turn a liquid into a gas.

Experiment - Practical activity to find something out or to demonstrate an idea.

Fair test - Type of experiment where just one thing is changed (called the independent variable).

Hypothesis - Scientific “guess” or prediction, tested by experiment.

Insoluble - A solid (usually) that will not dissolve.

Laboratory - Specialist science room.

Meniscus - Curved surface of a liquid eg when you look at water in a measuring cylinder.

Method - The procedure, instructions of how to do an experiment.

Mixture - More than one type of stuff mixed together, eg salty water.

Results - Observations or data collected in an experiment.

Saturated - Solution that will dissolve no more solid at that temperature.

Scales - Markings on side of ruler, thermometer etc or graph axes

Soluble - A substance that can be dissolved.

Solute - A substance that is dissolved in a liquid (solvent).

Solution - A mixture of a solute dissolved in a solvent.

Solvent - A liquid that substances can be dissolved in.

Suspension – Insoluble material that “hangs” in the solvent and settles if the mixture is left to stand.

Temperature - A measure of how hot or cold a substance is. It is measured in degrees Celsius.

Units - What a variable or quantity is measured in.

Vapour – Gas state.

SKILLS IN SCIENCE

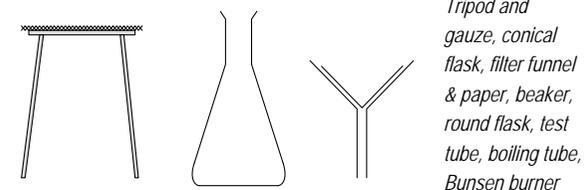
Safety rules – what & why

- ◆ Don't eat/drink in lab – toxic & corrosive substances are around
- ◆ Don't run or throw things – knock into people & things – silly and dangerous
- ◆ Wear safety glasses & shoes – protect yourself
- ◆ Clean up spills & breakages – may be corrosive substances / could get cut
- ◆ Tell teacher about any accidents – so they can decide on the best action to take

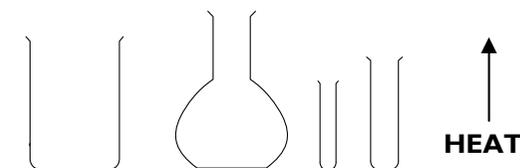


SCIENTIFIC DIAGRAMS

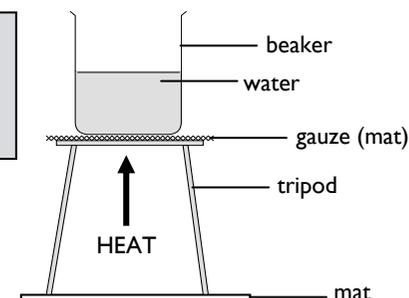
Should be large and clear and fully labelled AND use the correct 2D symbols.



Tripod and gauze, conical flask, filter funnel & paper, beaker, round flask, test tube, boiling tube, Bunsen burner



Labelled diagram of a beaker of water being heated.



metal tongs clamp boss clamp stand
test tube holder



Metal tongs are used for holding solids eg piece of magnesium; Test tube holder is for heating test tubes & boiling tubes.

The boss is used to attach the clamp to the clamp stand.

THE BUNSEN BURNER

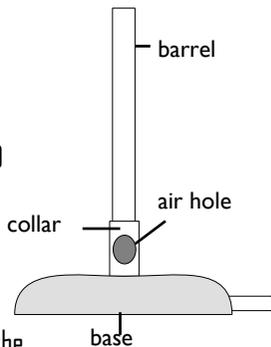
The Bunsen burner has three different flames.

- ◆ the yellow flame (air hole closed)
- ◆ the quiet flame (air hole half open)
- ◆ the blue or roaring flame. (air hole fully open)

The yellow flame is not used for heating because it leaves a covering of soot on the object being heated, and it is not a very hot flame. The Bunsen burner is left on this flame when it is not being used for heating. The quiet flame is the one usually used for heating. The blue or roaring flame is the hottest flame and is used for very fast or intense heating.

Instructions for Lighting

- ◆ Collect a Bunsen Burner.
- ◆ Connect the rubber tubing to the gas tap.
- ◆ Make sure that the air-hole is closed.
- ◆ Turn the gas tap full on AND Light the Bunsen burner at arms' length, about 5 cm *above* the top of the barrel.
- ◆ Close the air hole to make the yellow flame (safety flame).

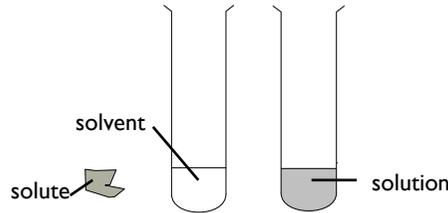


Soluble and Insoluble

A substance that dissolves is said to be **soluble**. Eg When copper sulfate and water mix they form a **solution**.

The "stuff" that dissolves is called the **solute**.

The liquid that the stuff dissolves in is called the **solvent**.



A substance that does not dissolve is said to be **insoluble**.

Insoluble substances do not mix in water. They usually sink in water (settle out on), and others float on top.

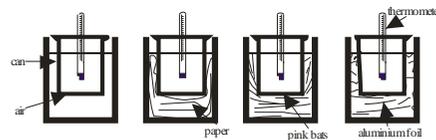
Insoluble mixtures do not form solutions but form **suspensions** instead. Eg when mud and water mix the mud does not dissolve in water. If it is left to settle for a while it will eventually sink to the bottom.

There is a limit to how much of any solid can dissolve in water or other liquids at a particular temperature. When no more of a solid will dissolve the solution is called **saturated**.

RESULTS TABLES, BAR CHARTS AND LINE GRAPHS

Results Table: This records the data collected from an experiment.

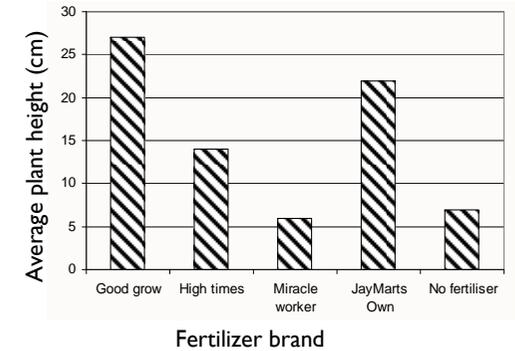
Aim: To find out which material is the better insulator.



Four materials are provided. All are used to help keep a house warmer and stop the heat escaping. Your task is to find out which material keeps the water hottest. Pour 75 mL of boiling water into each beaker. Measure the temperature. Measure the temperature after 15 minutes. Record the results in a suitable results table.

Material	Temperature (°C)		
	Start	After 15 minutes	Change
Air			
Paper			
Pink bats			
Aluminium foil			

Bar Chart: The items being compared do not affect each other. The bars do NOT touch each other. The numbers on the Y-axis start at 0 and go up evenly.



Line Graph: A line graph is best for showing how one variable affects another variable. Generally, with a line graph, both variables are measurable and so both have a number (and units) associated with them.

