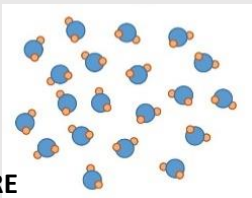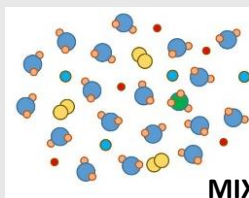science

chemistry

Y7 C2 – Separating Mixtures

1) Pure Substances
- Pure substances contain **only one type** of substance
- A **mixture** is an impure substance made of 2 or more substances that can be separated by a physical method


PURE   **MIXTURE**

- A substance's purity can be tested by measuring its melting or boiling point. Impure substances generally melt at lower temperatures and boil at higher temperatures
- **Pure water** freezes at **0ºC** and boils at **100ºC**

2) Solutions & Dissolving
- **Solute** – the substance you are dissolving e.g. salt
- **Solvent** – the liquid you are dissolving the solute in e.g. water
- **Solution** – the mixture you have made when you dissolve a solute in a solvent e.g. salt water

solute   **dissolving**   **solution**
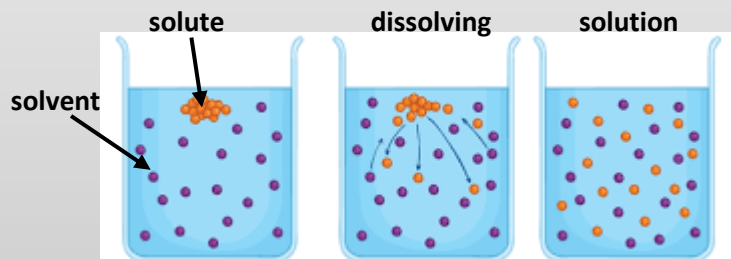
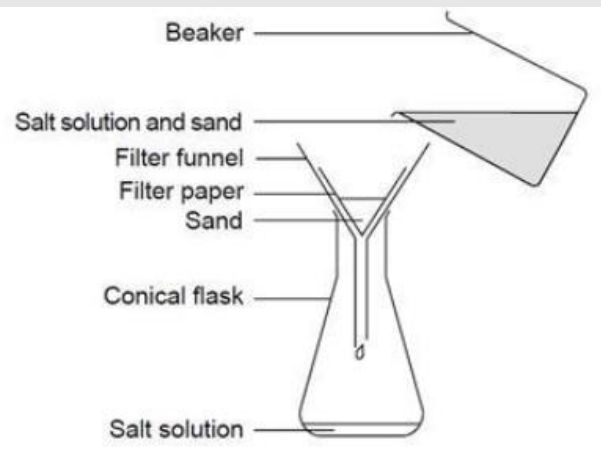**solvent**

3) Solubility
- **Soluble** – the substance will dissolve in the solvent e.g. salt is soluble in water
- **Insoluble** substances will not dissolve in the solvent e.g. sand is insoluble in water. However it may dissolve in another solvent (e.g. nail varnish)
- **Saturated solution** – the solution can not dissolve any more solute
- Increasing the temperature can increase the solubility

4) Filtration
Filtration is used to **separate soluble and insoluble substances** e.g. salt and sand.
Sand is insoluble so will not dissolve in water but salt will dissolve. When filtered the sand will stay on the filter paper whereas the salt water will pass through.
The liquid that passes through the filter is called the filtrate.

Beaker

Salt solution and sand
Filter funnel
Filter paper
Sand

Conical flask

Salt solution

5) Evaporation
Evaporation is used to **separate a solution**. The solvent is evaporated leaving the solute behind e.g. water is evaporated from salt water leaving salt.

Evaporating basin
Gauze

Tripod

Bunsen burner
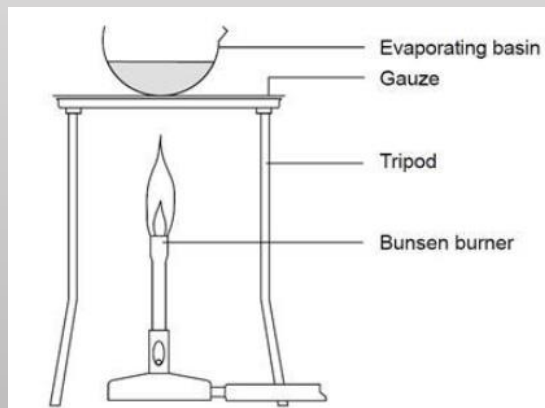
6) Distillation
Distillation is used to **separate liquids with different boiling points.** The mixture is heated and the substance with the **lower boiling point evaporates** first and it then cooled and **condenses** into a liquid (called the distillate).

thermometer
condenser
round bottomed flask
salt water
water
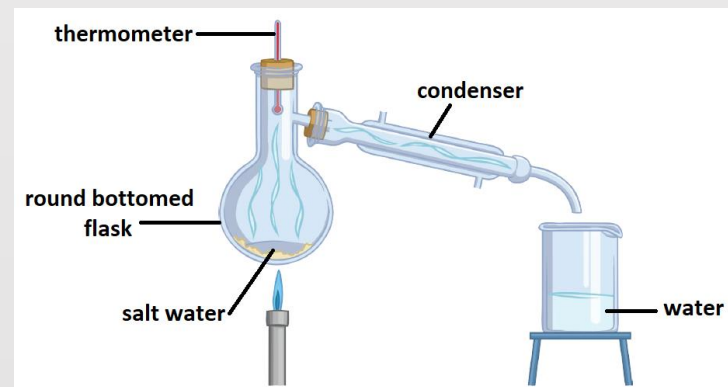
7) Chromatography
- **Separates different solutes in a solution** based on their **solubility** in the solvent.
- Substances with high solubility move further up the paper
- A line is drawn in pencil so it doesn't dissolve in the water
- Ink spots must be above the water (solvent)

Rf value = distance travelled by spot / distance travelled by solvent

START   RESULTS

chromatography paper

ink spot
pencil line
solvent