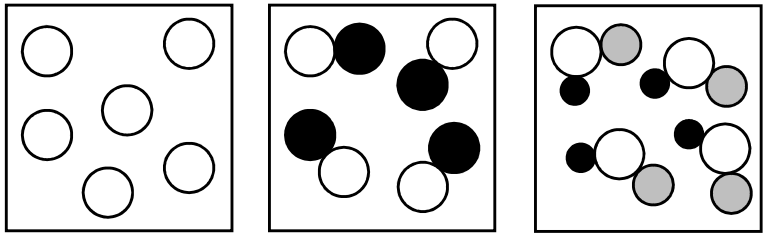
Y7 KNOWLEDGE ORGANISER
BIG IDEA: MATTER
TOPIC: SEPARATING MIXTURES

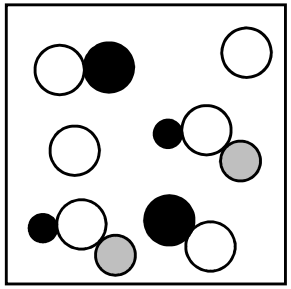
Key Word	Definition
solvent	A substance, normally a liquid, that dissolves another substance.
solute	A substance that can dissolve in a liquid.
dissolve	When a solute mixes completely with a solvent.
solution	Mixture formed when a solvent dissolves a solute.
soluble	Property of a substance that will dissolve in a liquid.
insoluble	Property of a substance that will NOT dissolve in a liquid.
solubility	Maximum mass of solute that dissolves in a certain volume of solvent.
pure substance	Single type of material with nothing mixed in.
mixture	Two or more pure substances mixed together, whose properties are different to the individual substances.
filter (filtering) (filtration)	Separating substances using a filter to produce a filtrate (solution) and residue.
distil (distilling) (distillation)	Separating substances by boiling and condensing liquids.
evaporate (evaporating) (evaporation)	A way to separate a solid dissolved in a liquid by the liquid turning into a gas.
chromatography	Used to separate different coloured substances.

In each of these diagrams the circles represent atoms.



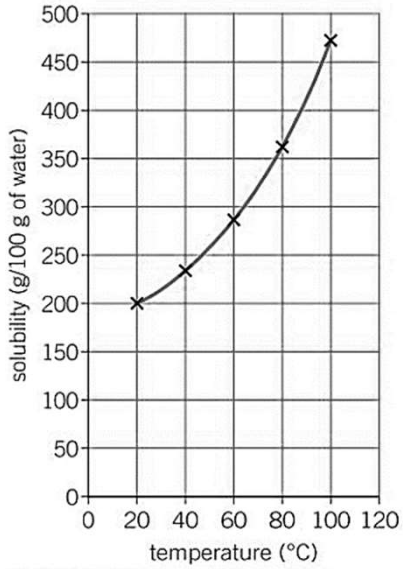
pure element **pure** compound **pure** compound

A pure substance consists of only one type of element or compound, and has a fixed melting and boiling point. Water is an example of a pure compound (made only of H_2O)



This **mixture** contains 1 element and 2 compounds mixed together. Because the different molecules are mixed together but not bonded they can be separated as each substance keeps its physical properties when mixed. The method chosen to separate a mixture depends on which physical properties of the individual substances are different.

Air, fruit juice, sea water and milk are **mixtures**.

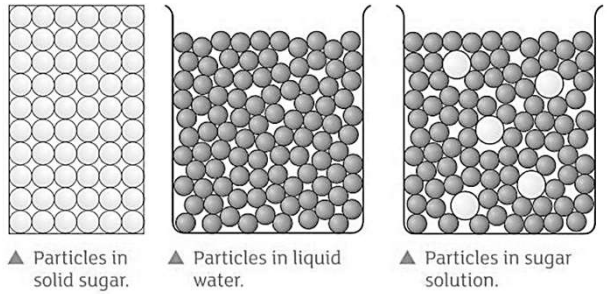


▲ Solubility curve for sugar.

Some substances are more **soluble** than others in certain **solvents**, others are **insoluble**, which means they don't **dissolve** at all.

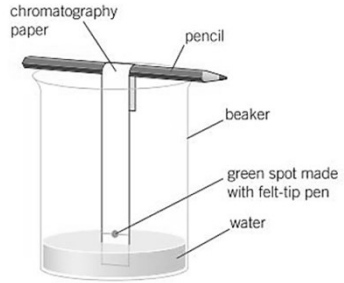
Solubility also changes with temperature. A **solubility** curve shows how much **solute** can **dissolve** in a solvent at different temperatures.

Different substances have different **solubility** curves and these can be analysed to find out how **soluble** a **solute** is in a certain **solvent**.

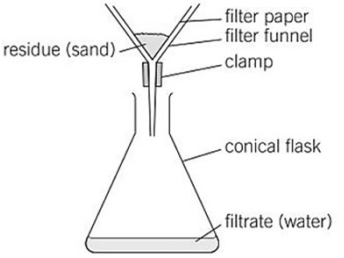


▲ Particles in solid sugar. ▲ Particles in liquid water. ▲ Particles in sugar solution.

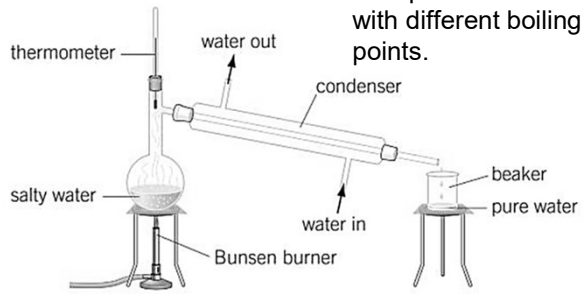
When a **solute dissolves** in a **solvent** the **solvent** particles surround each **solute** particle. The **solute** can mix with the **solvent**. They are arranged randomly and can move around in the **solution**.



Chromatography is used to separate different colours in a **mixture**. The coloured dots on the chromatogram allow you to see how many colours are in the **mixture**.



Filtering removes **insoluble** solids from liquids. If the solid particles are larger than the holes in the filter paper then they cannot pass through.



Distillation uses boiling and condensing to separate substances with different boiling points.

Knowledge organiser
Big idea: Matter

Y7 topic: Separating Mixtures

I have already learned:
In KS2: Filtering, sieving, evaporating. Dissolving and solutions.
In Y7: The particle model of matter, solids liquids and gases.
This topic links to:
Loads of chemistry! How we make new chemicals (making salts), get oil and petrol, analyse chemicals and get clean drinking water.

It is important to study about Separating Mixtures because…

Combining and separating mixtures is so important in everything scientists do. These ideas let us turn salty or dirty water into clean drinking water – something over 2 billion people still do not have daily access to. Distillation is how we get petrol and diesel from crude oil. Chromatography lets scientists identify chemicals. You may use these ideas in many future careers, and you will certainly need to understand them in science lessons in Y8 and beyond.

Possible careers involving Separating Mixtures are…

There are so many careers where knowing about separating mixtures is a huge part. Here are a few:
Chemical engineer (designing and producing new chemicals)
Water treatment worker (making water safe)
Petrochemical industry (working with oils and petrol)
Forensic scientist (testing evidence as part of police work)
Lab technician (preparing chemicals for use in labs or schools)
Pharmacy and **pharmacology** (medicines)