Separation Techniques **Progress Record**

Name: **Target:**

KS3 Science

Topic: Separation Techniques

Put a tick in each row to indicate how confident you feel with each statement.

I can describe the particle arrangements in mixtures.			
I can explain how to identify a pure substance.			
I can explain the difference between, solute, solvent and solution.			
I can draw a diagram to illustrate what happens to particles when dissolving occurs.			
I can explain solubility.			
I can explain what is meant by a saturated solution.			
I can explain what type of substances will filtration separate.			
I can draw and label filtration equipment.			
I can give 2 examples when filtration is useful.			
I can explain how evaporation can be used to separate mixtures.			
I can label a distillation diagram.			
I can explain how distillation can be used to obtain drinking water from salt water.			
I can explain how chromatography can be used to separate food colourings or dyes.			

Topic - **Separation Techniques**

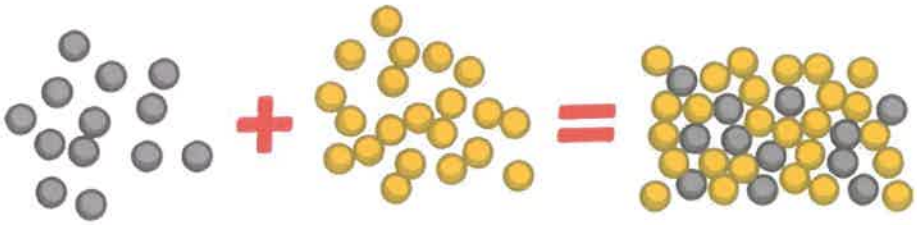
Place a tick to show you have completed the following:

Topic	I have studied	I have revised	I have attempted exam style questions
The particle arrangements in mixtures.			
How to identify a pure substance.			
The difference between, solute, solvent and solution.			
How to draw a diagram to illustrate what happens to particles when dissolving occurs.			
Solubility.			
What is meant by a saturated solution.			
The type of substances that filtration will separate.			
How to draw and label filtration equipment.			
Examples of when filtration is useful.			
How evaporation can be used to separate mixtures.			
How to label a distillation diagram.			
How distillation can be used to obtain drinking water from salt water.			
How chromatography can be used to separate food colourings or dyes.			

Separation Techniques

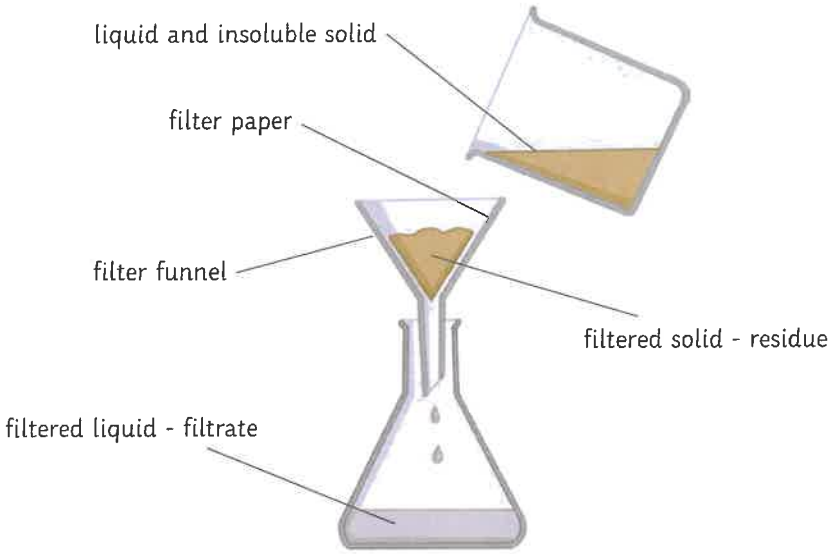
Key Revision Facts

- Mixtures contain several different substances, but they are not chemically combined.
- Pure substances can be identified by their boiling points.
- Solute – the solid that dissolves in a liquid.
- Solvent – the liquid the solute dissolves in.
- Solution – a mixture of the solute and solvent
- When salt is dissolved in water the particles mix with one another and do not disappear.



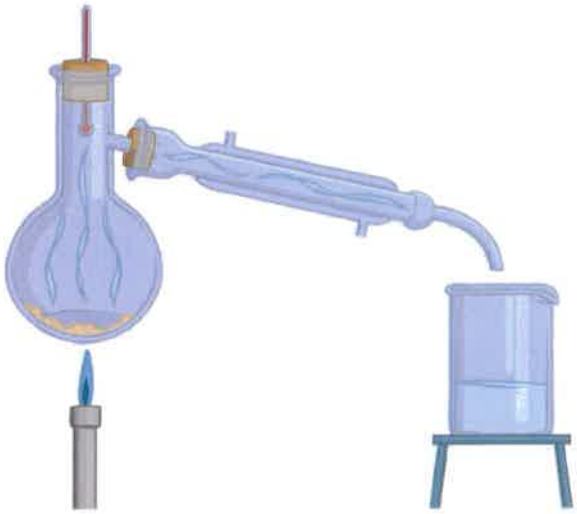
salt **water** **salt solution**

- Solubility is the mass of a solute that will dissolve in 100g of water.
- A saturated solution will not allow any more solute to dissolve.
- The apparatus for filtration is shown below.



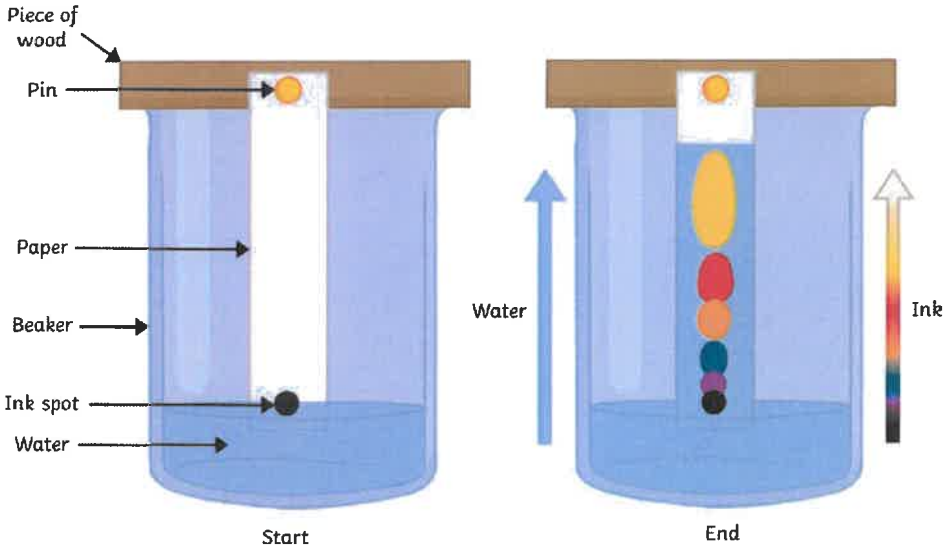
- Filtration will separate insoluble solids from liquids.
- Evaporating involves heating a solution, the water evaporates and crystals are left behind.

- Distillation can be used to obtain pure water from salt water. The equipment is shown below.



Salt water is heated up until it starts to boil, it is then cooled, condensed and collected. The salt is left behind in the flask and the pure water is collected in the flask.

- Chromatography is a separation technique used to find out which dyes are in a certain colour. The equipment is shown below.



Separation Techniques **Test Yourself 1**

Key Words Word Search

O	E	J	C	A	S	U	E	L	Z	G	E	P	S	H
I	F	T	V	Q	E	A	X	G	L	D	I	E	O	A
H	I	D	U	Q	K	Q	T	R	C	B	N	Q	L	J
B	S	W	O	L	A	I	T	U	Y	A	J	G	U	K
T	N	E	V	L	O	S	D	T	R	I	U	T	T	L
L	J	G	H	E	U	S	I	O	H	A	T	H	I	L
O	K	I	N	S	O	L	U	B	L	E	T	K	O	G
R	P	R	J	L	I	F	V	P	U	M	M	E	N	F
K	N	Y	U	B	L	D	E	Y	D	K	O	G	D	Y
B	X	B	U	Q	S	E	K	W	E	N	J	E	R	X
V	L	L	Z	E	E	C	N	T	W	T	I	C	W	Z
E	O	J	H	Q	T	U	Y	E	V	T	O	W	N	S
S	Z	X	W	Q	J	P	I	S	E	L	F	F	O	V
S	T	V	N	H	N	M	B	U	A	Z	N	M	Y	M
Q	U	H	Y	Y	P	S	L	L	Q	I	U	E	G	J

insoluble

saturated

solubility

soluble

solute

solution

solvent

Rock Salt

Rock salt is a mixture of rock and salt. Rearrange the sentences to state how the salt can be separated from the pieces of rock.

The salt will dissolve.
Pour the salt water into an evaporating dish and heat gently.
Add warm water to the rock salt and stir.
The water will evaporate and the salt crystals will appear in the evaporating dish.
Filter the mixture, the salt solution will collect in the beaker and the pieces of rock will collect in the filter paper.

Filtration Missing Vowels

r _ s _ d _ _ f _ ltr _ t _ _ ns _ l _ bl _ s-l-bl- l _ q _ _ d

Separation Techniques **Test Yourself 2**

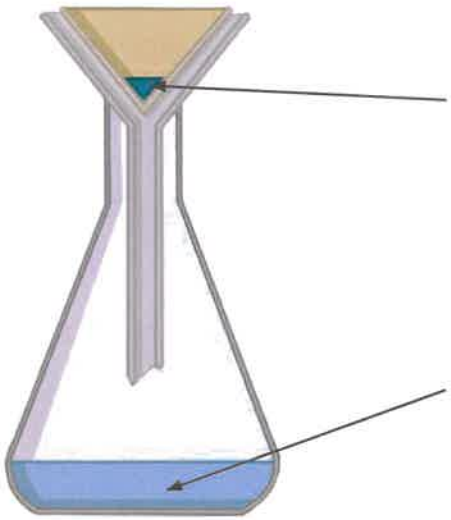
Match and Draw

Draw a line between the key word and its definition.

Solute	A mixture of the solid and liquid
Solvent	A substance that will dissolve in a liquid
Solution	The solid that dissolves in a liquid
Soluble	The liquid in which the solid dissolves

Filtration

Use the following words to label the apparatus: residue, filtrate, insoluble, solid and liquid.



Dissolving

Complete the 3 boxes below to show particles in salt, water and salt water.

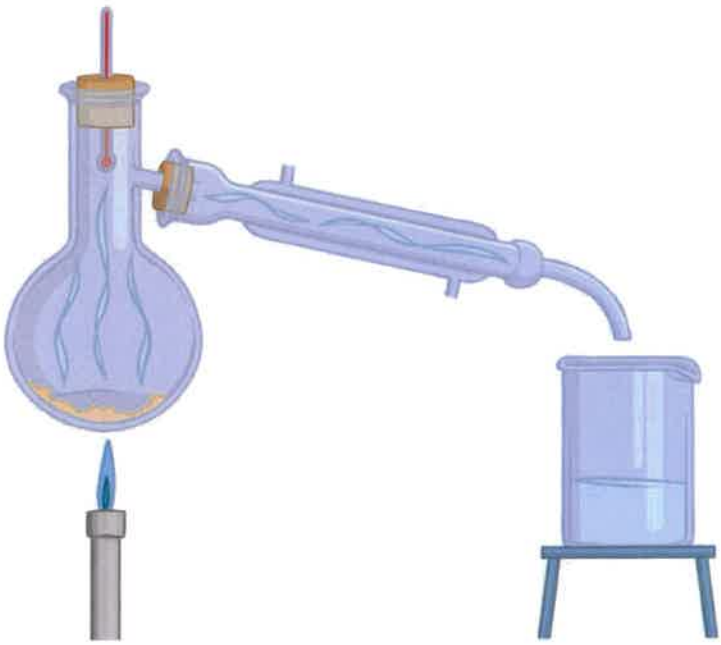
salt	liquid	salt water

Separation Techniques **Test Yourself 3**

Distillation

The apparatus below shows the apparatus to carry out distillation. Rearrange the sentences to explain how distillation works.

The water starts to boil and steam is produced.
The pure water drips into the conical flask.
The salt water is heated.
The steam travels through the condenser.
As the steam travels along the condenser it cools down and forms a liquid.



True or False?

State whether the following statement are true or false.

- Chromatography is used by forensic scientists.
- When a substance dissolves, it is correct to say it disappears.
- A saturated solution will not allow any more solute to dissolve in it.
- Filtration will separate a soluble and insoluble substance.
- Water is the only solvent.

Solubility

Write a sentence to explain how temperature affects solubility.

Separation Techniques **Exam Style Questions 1**

1. Distillation is a method that can be used to obtain drinking water from a sample of salt water. Two different examples of distillation apparatus are shown below.

A B

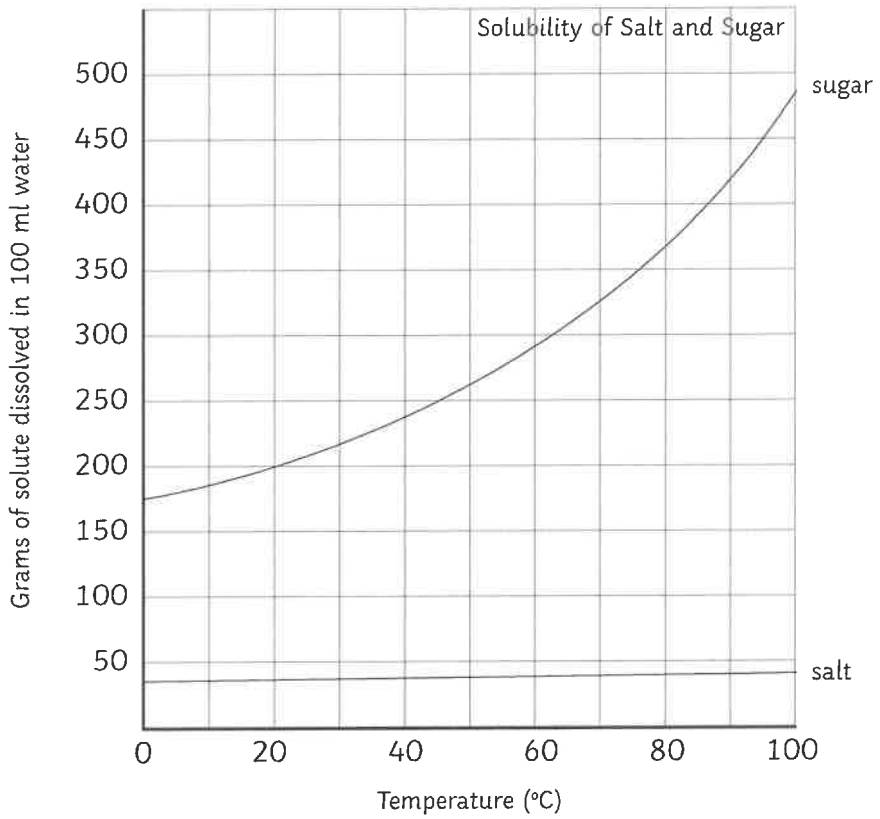
- Which apparatus A or B will produce the drinking water the quickest? Give a reason for your choice.

- Using the following key words, explain how distillation works.
  Key words: boils, cools, condenses, steam.

2. In the space below, draw and label the apparatus required to separate a soluble substance from an insoluble substance.

Separation Techniques **Exam Style Questions 2**

1. The results to show the solubility of sugar and salt at different temperatures is shown below.



- How does temperature affect the solubility of sugar?
- State the main differences between the solubility of sugar and salt as there is an increase in temperature.
- At 60°C, how many grams of sugar dissolved in 100ml of water?

2. Paper chromatography can be used to identify dissolved substances, for example in food colourings. Explain how it works.