Physical changes – Checkpoint Primary chemistry

1. No.5

The table shows the properties of some solids.

solid	solubility in water	is it magnetic?	is it a lump or a powder?
copper	insoluble	no	lump
salt	soluble	no	powder
steel	insoluble	yes	powder

Jamila has a mixture of copper, salt and steel.

Describe how she can separate the copper from the mixture.

Sieve the mixture, the lump will remain on the sieve while powder goes through.

Explain why the separation works.

-Sieve only allows powder through, the lumps will remain on the sieve. [2]

2. No.12

Jamila and Carlos heat a substance.

They measure the temperature of the substance every minute.

Before they start the investigation, Jamila makes this prediction:

'The longer the substance is heated the higher the temperature of the substance.'

Look at their results table.

time in minutes	temperature in °C
0	25
1	29
2	33
3	37
4	41
5	45
6	49
7	49
8	49
9	52
10	57

(a) Complete the sentence to describe the pattern in the results.

As the time increases the temperature increases then stays constant and then increases again. [2]

(b) Do the results support Jamila's prediction?

Yes

Explain your answer.

because final temperature is higher than initial temperature

[1]

(c) Carlos decides to present their results in another way.

Circle the **best** way to present the results.

bar chart

histogram

line graph

pie chart

[1]

3. No.8

Oliver investigates what happens to materials when they are heated.

Here are his results.

material	before heating	after heating
A	silver solid	white solid
B	green solid	black solid
C	colourless liquid	gas
D	white solid	white solid
E	white solid	colourless liquid

(a) Which material does **not** change when Oliver heats it?

D [1]

(b) Which material **boils** when Oliver heats it?

C [1]

(c) Which material **melts** when Oliver heats it?

E [1]

4. No.16

Blessy is investigating the time it takes to dissolve sugar cubes in water.

- Blessy measures 200 cm^3 of water.
- She puts the water into a beaker.
- She adds one sugar cube to the water.
- Blessy stirs the mixture with a glass rod.
- She measures the time it takes the sugar cube to dissolve.

She repeats this experiment four more times.

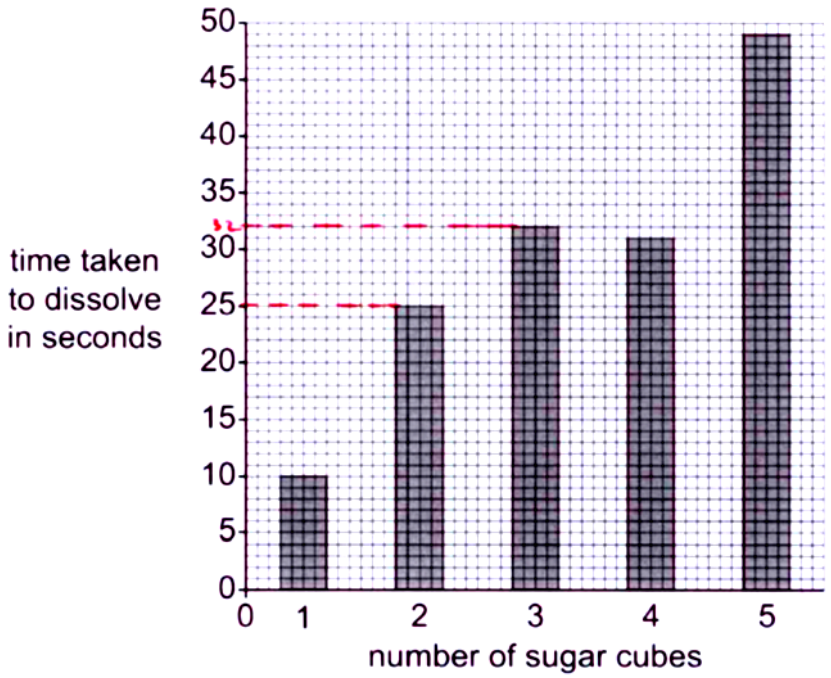
Each time she uses a different number of sugar cubes.

(a) Blessy wants to do a fair test.

Write down one **factor** she must keep the same.

temperature ..... [1]

(b) Here are Blessy's results.



What is the time taken to dissolve

two sugar cubes: 25 seconds

three sugar cubes: 32 seconds

[2]

(c) Blessy predicts that it would take 55 seconds for 6 sugar cubes to dissolve.

She checks her prediction by doing the experiment with 6 sugar cubes three times.

Here are her results.

experiment with 6 sugar cubes	time to dissolve in seconds
1	55
2	46
3	48

Do these results support Blessy's prediction? NO

Explain your answer.

Because the average value is less than 55

[1]

(d) It was a good idea for Blessy to check her prediction using three experiments rather than just one.

Explain why.

To check the results that they are are more reliable.

[1]

5. No.16

Yuri investigates how much salt dissolves in water.

He predicts that the hotter the water, the more salt will dissolve.

Here are his results.

temperature of water in °C	mass of salt dissolved in ....
10	27
20	29
30	31
40	33
50	35
60	37

(a) Yuri forgets to put the unit for mass in the table.

What is the unit for mass?

grams (g). [1]

(b) Yuri uses 100 cm^3 of water for each temperature of water.

Explain why.

to make it a fair test.

[1]

(c) Yuri's friend suggests he repeat the experiment.

Why is this a sensible suggestion?

to check the accuracy of the results [1]

6. No.11

Jamila dissolves salt in water to make salt water.

(a) The water in Jamila's experiment is a solvent.

What is the meaning of the word **solvent**?

a liquid in which a substance can dissolve [1]

(b) Salt is a soluble substance.

What is the meaning of the word **soluble**?

a substance that dissolves in a liquid [1]

(c) Salt water is an example of a solution.

What is the meaning of the word **solution**?

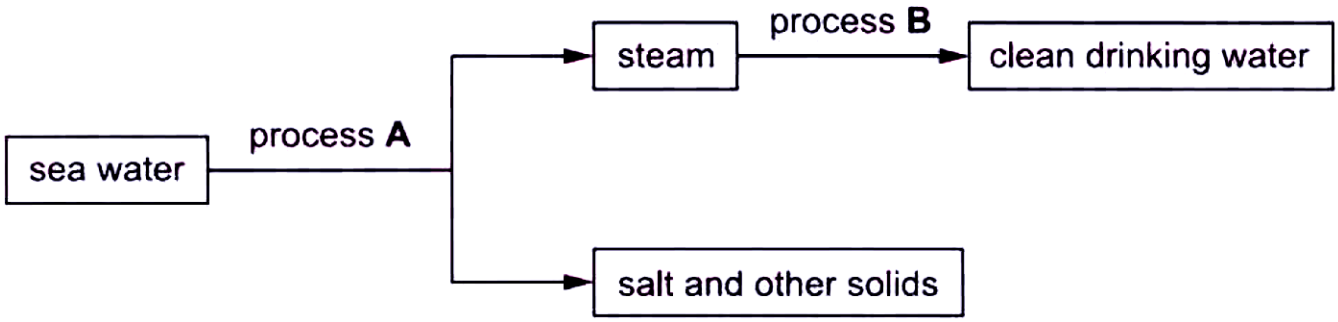
a mixture of a solvent and solute. [1]

7. No.11

Sea water contains many substances dissolved in water.

One of these substances is salt.

Look at the chart describing how clean drinking water is made from sea water.



(a) What is the name of process **A**?

boiling ..... [1]

(b) What is the name of process **B**?

Condensing ..... [1]

(c) Sea water **cannot** be filtered to remove salt to make clean drinking water.

Explain why.

Because salt is in the solution, dissolved in water. ..... [1]

8. No.16

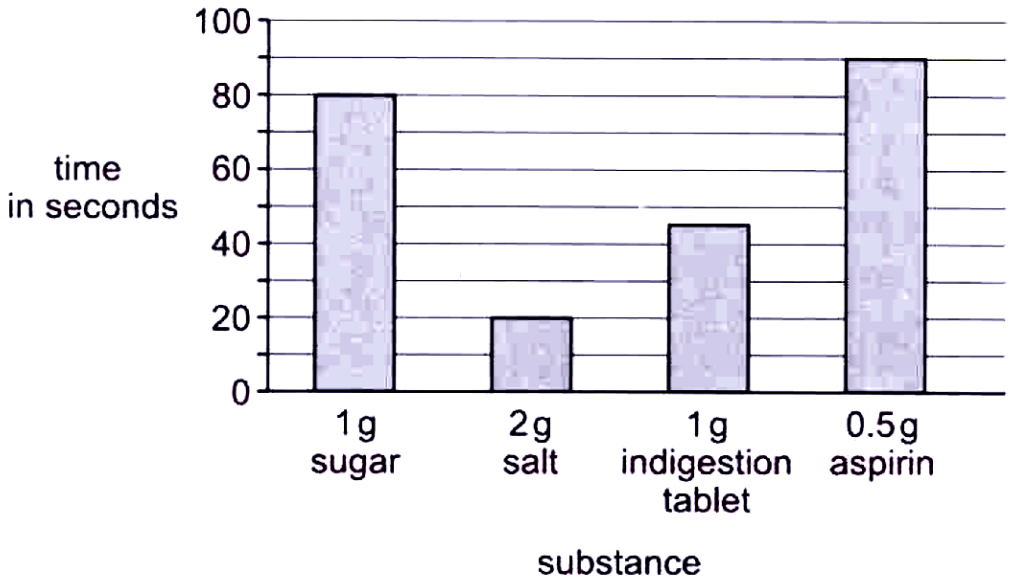
Jamila investigates the time it takes for different substances to dissolve in water.

In each experiment she

- uses 100 cm^3 of water and adds one of the substances
- stirs the mixture until the substance dissolves
- stirs the mixture at the same speed.

Jamila repeats the experiment with different substances.

She plots her results as a bar chart.



(a) Jamila has **not** done a fair test.

Use information from the bar chart to explain why.

Used different masses of substances [1]

(b) Which substance dissolves in the **shortest** time?

Salt dissolved in 20 seconds [1]

(c) How long does it take to dissolve the **indigestion tablet**?

45 seconds seconds [1]

(d) Jamila predicts that as the mass of aspirin increases, the time taken to dissolve it increases.

She tests her prediction by doing experiments.

Tick (✓) the **three** factors she keeps constant.

mass of aspirin	☐
speed of stirring	✓
temperature of water	✓
time to dissolve	☐
volume of water	✓

[2]

9. No.2

Lily adds separate samples of solids to water.

She stirs the solid and water to see if the solid dissolves.

Here are her results.

solid	colour of solid	does the solid dissolve?	colour of solution
chalk	white	no	no solution is formed
copper carbonate	green	no	no solution is formed
copper sulfate	blue	yes	blue
salt	white	yes	colourless
sugar	white	yes	colourless

(a) Complete the sentences.

Sugar dissolves in water because water is a Solvent.

Chalk does **not** dissolve because it is insoluble.

[2]

(b) Copper sulfate is a blue solid.

It dissolves in water.

What colour solution does it form?

blue [1]

(c) Salt dissolves in water to form salt solution.

What is the name of the **solute** in salt solution?

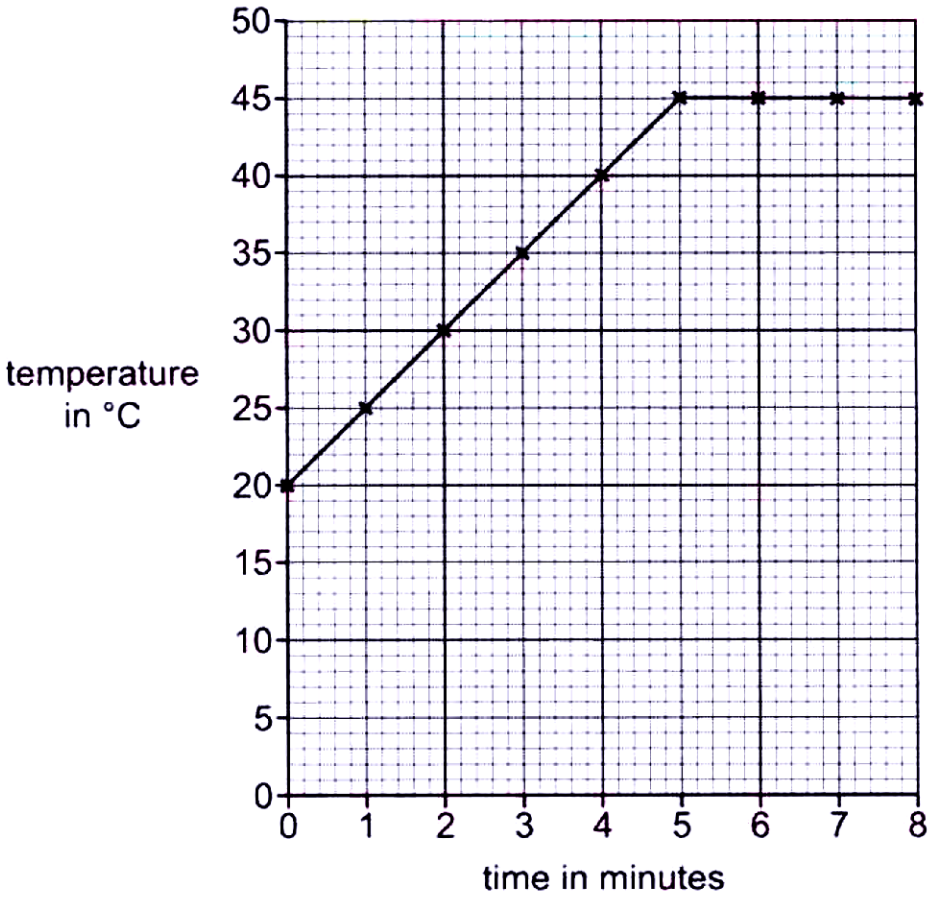
Salt. [1]

10. No.8

Mia heats a substance.

She measures the temperature of the substance every minute.

Here is a line graph of her results.



(a) Name the apparatus Mia uses to measure temperature.

thermometer [1]

(b) Complete the sentence about the patterns in the results.

As the time increases, the temperature increases then stays constant after 5 minutes. [2]

11. No.1

Some solids dissolve in water and some do **not**.

Complete the table.

One has been done for you.

solid added to water	does the solid dissolve?
iron	no
salt	yes
sand	no
silver	no
sugar	yes

[2]

12. No.15

Ahmed investigates the solubility of four substances **A**, **B**, **C** and **D**.

He wants to find which substance is the most soluble.

In his first experiment he

- uses 25 cm^3 of water at a temperature of 20 °C
- adds substance **A** to the water until it just stops dissolving
- records the mass of substance **A** that has dissolved.

Ahmed then tests substances **B**, **C** and **D**.

(a) Ahmed wants to do a fair investigation.

What volume of water should he use in each experiment?

25 cm^3 ..... [1]

(b) Ahmed wants to do a fair investigation.

What temperature of water should he use in each experiment?

20 °C ..... [1]

(c) Gabrielle suggests that Ahmed should do each experiment again.

Why is it a good idea to repeat experiments?

to make investigation more reliable ..... [1]

(d) Ahmed decides to investigate the solubility of substance **A** at higher temperatures of water.

Suggest a possible prediction for this investigation.

More of A can dissolve at higher temperature. ..... [1]

13. Solid magnesium sulfate dissolves in water to form a colourless solution.

(a) What is the name of the **solvent** in this colourless solution?

Water ..... [1]

(b) The solution is left in a warm room for 10 days.

After 10 days all the water has disappeared.

What has happened to the water?

evaporated into gas ..... [1]

(c) After 10 days a solid is left behind.

What is the name of the **solid** left behind?

magnesium sulfate ..... [1]