Solids, liquids and gases – Checkpoint Primary chemistry

1.

Priya investigates the melting point of some unknown substances.

Here are the results of her investigation.

substance	melting point in °C
A	15
B	76
C	100
D	0
E	26

(a) Complete the sentence.

Choose from the list.

gas **liquid** **solid**

The temperature in the laboratory is 25 °C.

Substance **E** is a ..... in the laboratory. [1]

(b) Priya thinks that substance **D** is water.

Explain why.

.....

..... [1]

(c) Priya finds more information so she knows substance **D** is water.

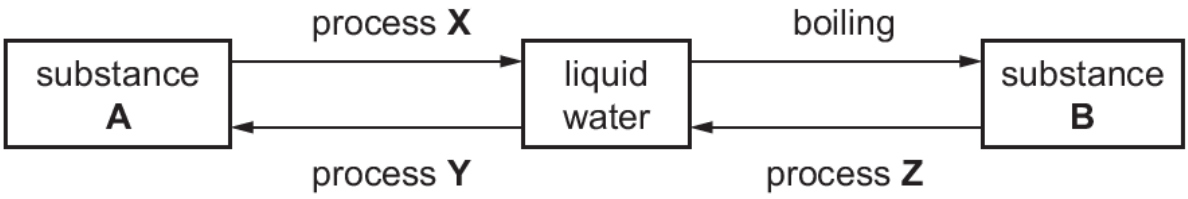
Suggest what information she finds.

..... [1]

2.

The three states of matter are solid, liquid and gas.

Here is a diagram of the three states of matter of **water**.



(a) Name substance **A** and substance **B**.

A .....

B .....

[1]

(b) Name process **X**.

..... [1]

(c) Name process **Y**.

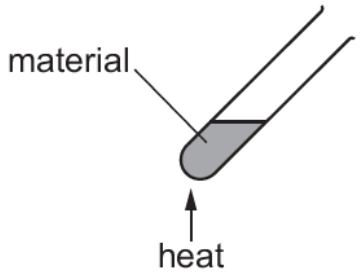
..... [1]

(d) Name process **Z**.

..... [1]

3.

Blessy heats some materials in a test-tube.



Here is her results table.

material	appearance of material	observations when heated
A	colourless solid	turns into a colourless liquid
B	white solid	remains a white solid
C	green solid	changes to a black solid
D	white solid	changes into a colourless liquid
E	colourless liquid	turns into steam

(a) Name **one** piece of safety equipment Blessy **wears** during the experiment.

..... [1]

(b) Two of the materials melt when heated.

Write down the letters of the **two** materials that melt when heated.

..... **and** ..... [1]

(c) One of the materials does **not** change when heated.

Write down the letter of the material that does **not** change when heated.

..... [1]

(d) One of the materials is water.

Write down the letter of the material that is water.

.....

Explain your answer.

.....

[1]

(e) Blessy heats material **C**.

She predicts the mass of the test-tube and its contents will change.

Blessy measures the mass of the test-tube and its contents **before** she heats material **C**.

What **other measurement** does she make to see if her prediction is correct?

.....

..... [1]

4.

The freezing point of a material is the temperature when a liquid becomes a solid.

(a) What is the meaning of the words **boiling point**?

.....

..... [1]

(b) Write down the temperature of the boiling point of **water**.

Include the units.

..... [1]

(c) What is the meaning of the words **melting point**?

.....

..... [1]

(d) Write down the temperature of the melting point of **water**.

Include the units.

..... [1]

5.

Jamila wants to know if a colourless liquid contains a dissolved solid.

She heats the liquid until it boils.

Jamila measures the boiling point of the liquid.

(a) What is the meaning of the words **boiling point**?

.....

.....

..... [2]

(b) Angelique tells Jamila to keep heating the liquid until all the liquid has boiled away.

What will Jamila see if the liquid contains a dissolved solid?

..... [1]

6.

Mia finds this information about some substances at room temperature.

substance	does the substance flow easily?	can the substance be easily squeezed (compressed)?	does the substance melt when heated to 100 °C?
A	no	no	yes
B	yes	no	no
C	yes	yes	no
D	no	no	no
E	yes	no	no
F	yes	yes	no

(a) Which **two** substances in the table are solids?

..... and .....

Give a reason for your answer.

.....

.....

[2]

(b) Which **two** substances in the table are liquids?

..... and ..... [1]

(c) Which **two** substances in the table are gases?

..... and ..... [1]

(d) Which substance in the table changes into a liquid when it is heated to 100 °C?

..... [1]

7.

Look at the information about the melting point and boiling point of some substances.

substance	melting point in °C	boiling point in °C
A	10	100
B	1050	2400
C	950	2100
D	0	105
E	55	210
F	10	210

(a) Which substance has the same boiling point as water?

Choose from the table.

..... [1]

(b) Which substance has the same melting point as water?

Choose from the table.

..... [1]

(c) What is the freezing point of substance **E**?

..... °C [1]

(d) The temperature in a classroom is 25 °C.

The substances in the table are stored in the classroom.

Which **three** substances are liquids in the classroom?

..... [2]

8.

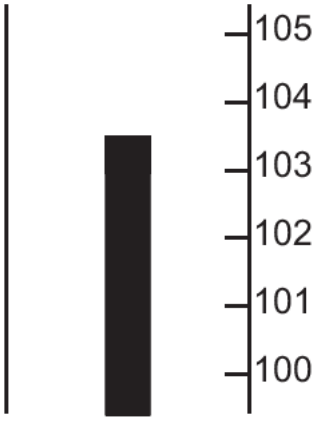
Hassan has a sample of a liquid.

(a) Name the piece of equipment he uses to accurately measure 50 cm^3 of this liquid.

..... [1]

(b) Hassan heats the liquid until it boils.

Look at the reading on the thermometer when the liquid is boiling.



Write down the boiling point of the liquid.

..... [1]

9.

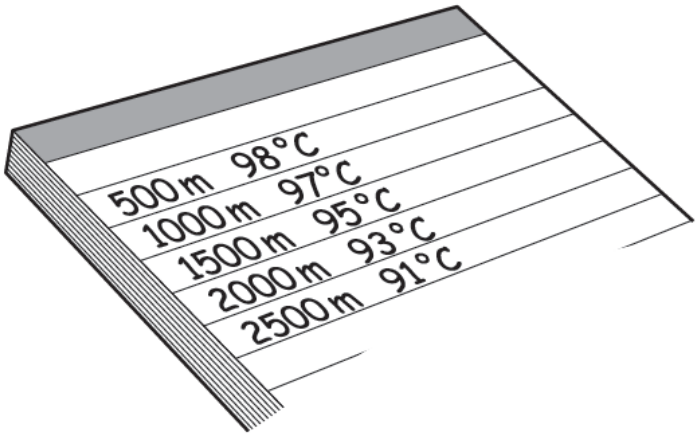
Pierre climbs mountains.

He boils water when he is camping on a mountain.

He notices that the water boils at **different** temperatures.

He writes down the height of the mountain and the temperature that the water boils.

Here is the page from his notebook.

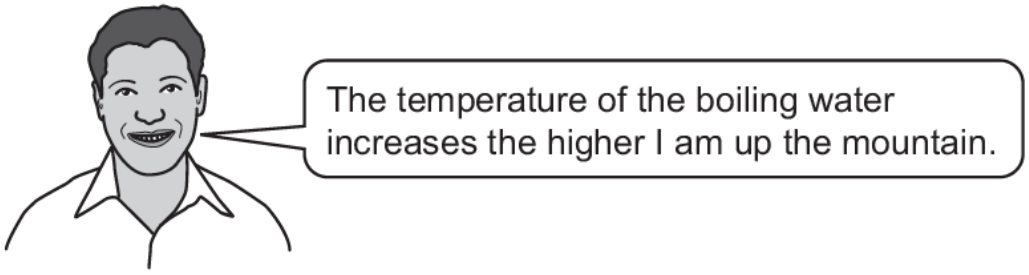


(a) Complete the table with Pierre's results.

Include the headings.

[3]

(b) Pierre makes a conclusion.



Do Pierre's results support his conclusion?

.....

Explain your answer.

.....

.....

[1]

10.

The table shows some boiling points of substances.

substance	boiling point in °C
A	15
B	1095
C	100
D	0
E	444

(a) What is the meaning of the term boiling point?

.....

.....

..... [2]

(b) Which substance could be water?

.....

Explain why.

.....

.....

[2]

11.

Potassium sulfate is a white solid.

It dissolves in water to give a colourless solution.

The boiling point of this solution is 107 °C.

(a) What happens when a liquid boils?

..... [1]

(b) Calculate the difference between the boiling point of the solution and the boiling point of pure water.

.....

Explain your answer.

.....

..... [2]

12.

At room temperature a material is either a solid, liquid or a gas.

Complete the table by putting ticks (✓) in the correct boxes.

One has been done for you.

material	at room temperature material is a …..		
	solid	liquid	gas
carbon dioxide			✓
gasoline			
mercury			
nitrogen			

[3]

13.

Match the following processes to the correct change of state.

Draw a line between the **process** and the correct **change of state**.

process	change of state
	gas to liquid
condensation	gas to solid
evaporation	liquid to gas
freezing	liquid to solid
melting	solid to gas
	solid to liquid

[4]

14.

Hassan owns a motor car.

For each material in the table, put a tick (✓) in the correct column to show if it is a solid, a liquid or a gas at room temperature.

material	solid	liquid	gas
air			
gasoline			
iron			
plastic			
rubber			

[2]

15.

Blessy investigates some colourless liquids.

She boils the liquids for 15 minutes.

Look at her results.

liquid	temperature of boiling liquid in °C	other observations
A	107	liquid completely disappears
B	104	liquid disappears and leaves behind a white solid
C	100	liquid completely disappears
D	65	liquid completely disappears
E	160	liquid completely disappears

(a) What is the name of the apparatus Blessy uses to measure the temperature?

..... [1]

(b) Blessy must be careful doing the experiment since the liquids may be flammable.

Explain why Blessy must be careful.

..... [1]

(c) Describe what happens to a liquid when it boils.

..... [1]

(e) One of the liquids is a solution.

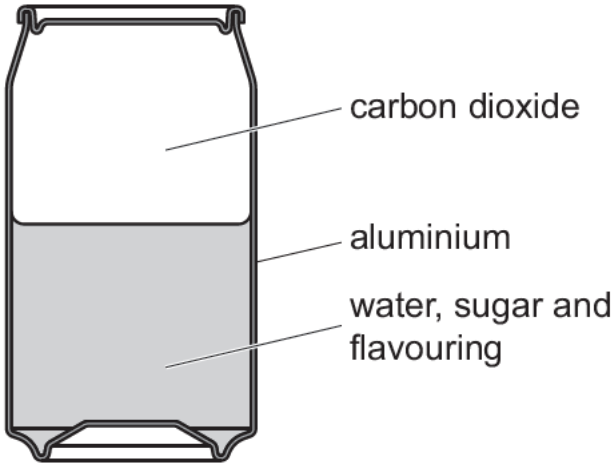
Which one? .....

Explain your answer.

..... [1]

16.

Look at the diagram of a fizzy drinks container.



(a) Which material shown in the diagram is a gas?

..... [1]

(b) Aluminium is used to make the fizzy drinks container because of its properties.

One of these properties is that it does **not** corrode.

Write down two **other** properties.

1 .....

2 .....

[2]

17.

Here is a table of melting points and boiling points.

material	melting point in °C	boiling point in °C
A	– 60	10
B	0	103
C	45	150
D	10	100
E	0	100

(a) Which **two** materials have a melting point **above** the melting point of water?

Choose **A**, **B**, **C**, **D** or **E** from the table.

..... **and** ..... [1]

(b) Which material is **water**?

Choose **A**, **B**, **C**, **D** or **E** from the table.

..... [1]

(c) The room temperature in a laboratory is 25 °C.

Which material is a **solid** in the laboratory?

Choose **A**, **B**, **C**, **D** or **E** from the table.

..... [1]

(d) The room temperature in a laboratory is 25 °C.

Which material is a **gas** in the laboratory?

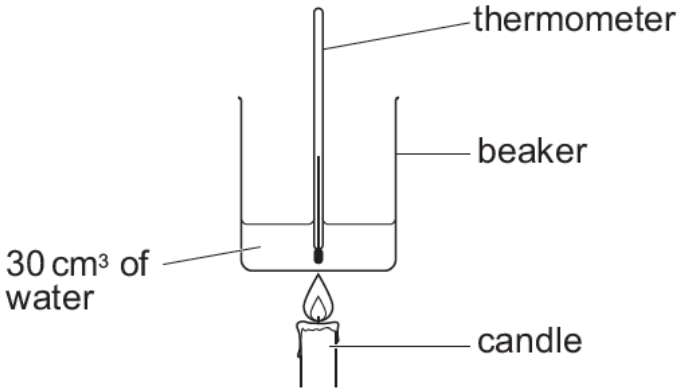
Choose **A**, **B**, **C**, **D** or **E** from the table.

..... [1]

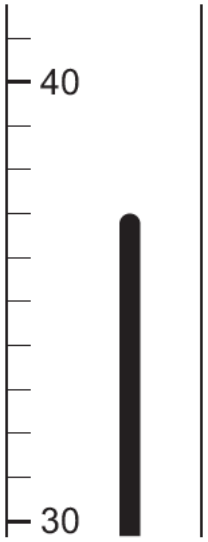
18.

Pierre uses a candle to heat a beaker of water.

Here is a diagram of his experiment.



(a) The diagram shows the thermometer after 10 minutes.



What is the temperature of the water after 10 minutes?

..... °C [1]

(b) At the start the temperature of the water was 20 °C.

What is the temperature increase?

..... °C [1]

(c) Pierre continues to heat the beaker.

What happens to the water when its temperature reaches 100 °C?

..... [1]

(d) Pierre sees some liquid wax at the top of the candle.

What process has happened to the solid wax?

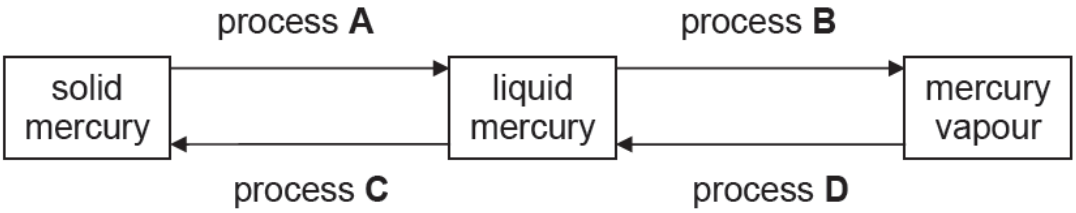
..... [1]

19.

Mercury vapour is very poisonous.

Mercury is a silver coloured liquid at room temperature.

Liquid mercury has to be cooled to make solid mercury.



Complete the sentences.

(a) Process **A** changes solid mercury into liquid mercury.

This process is ..... . [1]

(b) Process **B** changes liquid mercury into mercury vapour.

This process is ..... . [1]

(c) Process **C** changes liquid mercury into solid mercury.

This process is ..... . [1]

(d) Process **D** changes mercury vapour into liquid mercury.

This process is ..... . [1]

20.

Solid, liquid and gas are the three states of matter.

Here is a table showing the states of matter of different substances at different temperatures.

substance	state at –10°C	state at 50°C	state at 150°C
water	solid	liquid	.....
salt	solid	.....	solid
wax	solid	liquid	liquid
oxygen	gas	gas	gas
nitrogen	.....	gas	gas

(a) Complete the table. [3]

(b) Ice becomes liquid water when it melts.

What is the melting point of ice?

..... °C [1]

(c) When liquid wax is cooled down it changes into a solid.

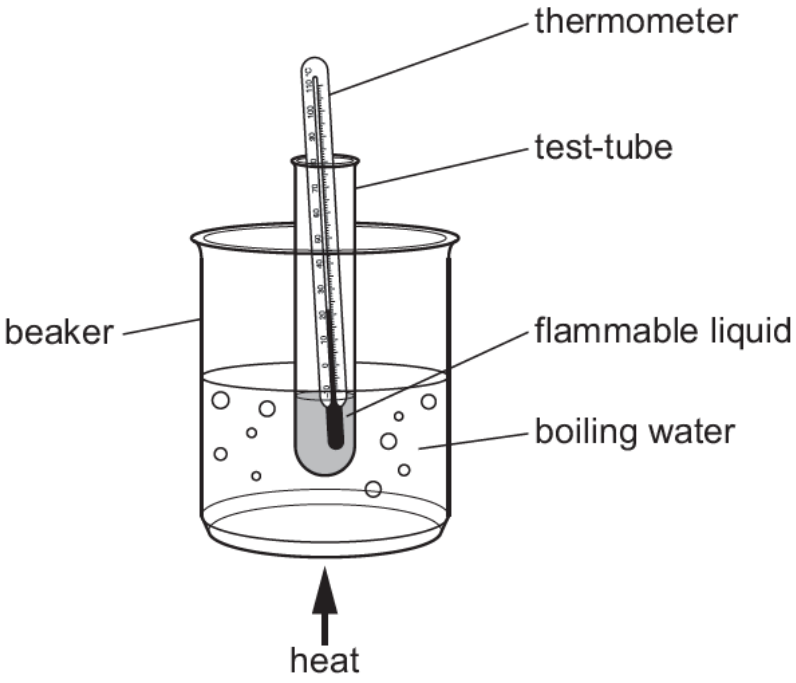
Name this process.

..... [1]

21.

Aiko wants to find the boiling point of a flammable liquid.

This is the apparatus she uses.



Aiko does **not** use a Bunsen burner to heat the water in the beaker.

She uses an electrical heater instead.

Suggest why.

.....

..... [1]

22.

Blessy investigates five different substances.

This is the information she finds.

substance	melting point in °C	boiling point in °C	what happens when Blessy heats the substance for 10 minutes
A	– 4	104	evaporates to leave a white solid
B	52	100	melts and forms a colourless liquid
C	0	64	completely evaporates
D	567	1650	stays a white solid
E	0	100	completely evaporates

(a) Which substance has the **lowest** melting point?

..... [1]

(b) Which of the substances is a solution of salt in water?

.....

Write a reason for your answer.

..... [2]

(c) Room temperature is 25 °C.

Substance **B** is a solid at room temperature.

Use the information in the table to explain why.

..... [1]

23.

The three states of matter are solid, liquid and gas.

(a) The table shows the state of matter at room temperature of some substances.

Complete the table by putting ticks (✓) in the correct boxes.

Water has been done for you.

substance	state of matter at room temperature		
	solid	liquid	gas
carbon dioxide			
gasoline			
mercury			
water		✓	
wood			

[2]

(b) Copper has a melting point of 1083 °C.

What change of state happens when copper **melts**?

..... **to** ..... [1]

(c) Copper has a boiling point of 2567 °C.

What change of state happens when copper **boils**?

..... **to** ..... [1]

(d) Copper is heated to 2000 °C.

What is the state of matter of copper at 2000 °C?

..... [1]

24.

The three states of matter are solid, liquid and gas.

(a) What is the name of the process that occurs when a **liquid** turns into a **gas**?

..... [1]

(b) What change of state occurs during **freezing**?

..... to ..... [1]