

The states of matter

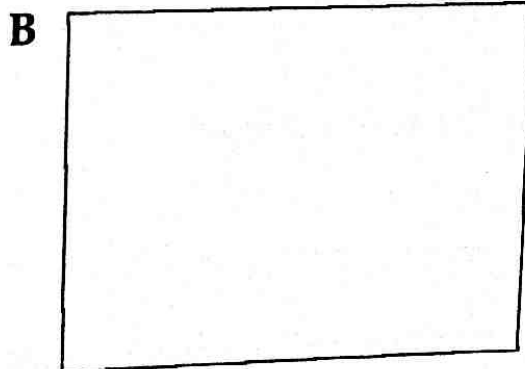
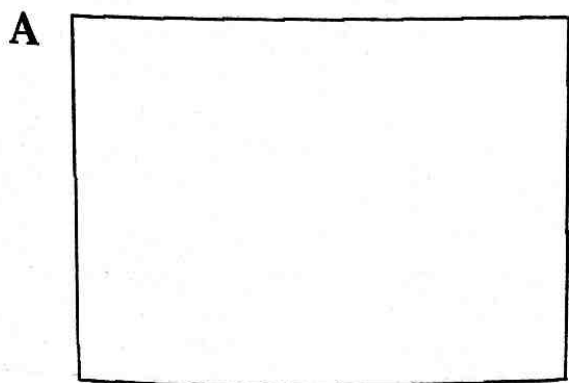
Comparing the states of matter and The particle theory of matter

1 Which of the following is a property of a gas? Tick (✓) one box.

Fixed shape. Does not flow.

Easy to compress. The volume does not change.

2 a) In box A draw the arrangement of particles in a solid. In box B draw the arrangements of particles in a gas.



b) Particles in a liquid can change position. How do they do this?

3 a) What must you do to make a solid melt?

b) How can you tell when a solid is melting?



c) What happens to the particles during melting? Tick (✓) one box.

They receive more energy.

They receive less energy.

The amount of energy they possess does not change.

d) How does the movement of the particles change during the melting process?

e) What is the opposite of melting? _____



4 Four identical containers were set up, each containing 100 g of liquid. They were put in a range of conditions and left for the same amount of time before the mass of each liquid was measured again.

The table shows the data for this investigation.

Container	Conditions	Mass of liquid at the beginning/g	Mass of liquid at the end/g
A	warm/still	100	70
B	cold/still	100	95
C	warm/windy	100	50
D	cold/windy	100	80

a) How was the test made fair? _____

b) Which container lost the least amount of liquid? _____

c) Which pair of conditions produced the greatest evaporation?

d) In which container would the liquid dry out first? _____

e) Where in a liquid does evaporation occur? _____

f) What do particles in a liquid need in order to escape from it?

g) When a liquid evaporates, which state of matter does it change into?

5 a) How can you tell when a liquid is boiling? _____

b) What is the name of the temperature at which a liquid boils?

c) What happens when a boiling liquid is heated more strongly?
Tick (✓) one box.

Its temperature rises. It boils faster.

It stops boiling. Its temperature falls.

6 a) How is a liquid produced by condensation?

b) Where does condensation occur in cloud formation? _____

7 a) Which state of matter does **not** form in sublimation? Tick (✓) one box.

Solid Liquid Gas

b) A vulcanologist finds some sulfur on the side of a steaming volcano. Explain how it got there from inside the volcano.

8 a) What is the difference between a solute and a solvent?

A solute _____

A solvent _____

b) Where do particles of the dissolving substance go in the liquid?



The particle theory

The properties of matter and the particle theory

1 Which statement is true about the mass of solids, liquids and gases?
Tick (✓) one box.

The masses change with temperature.

They all have a definite mass.

Their masses change with time.

Their masses change with position.

2 a) How many dimensions has the structure of a solid? Circle your answer.

- 1
- 2
- 3
- 4
- 5

b) What is the name for the orderly arrangement of the structure of a solid?

c) What holds solid particles together? _____

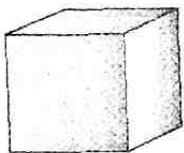
d) Describe the movement of solid particles. _____

3 Why can liquids flow but solids cannot? _____

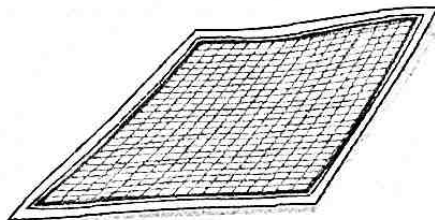
4 Why can you compress (squash) a gas much more easily than you can compress a liquid? _____

When states of matter change

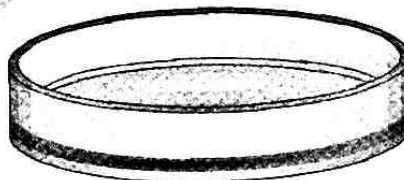
5 Jamil wants to measure the rate at which an ice cube melts. He has collected the following items. The Petri dish is transparent.



ice cube



graph paper



Petri dish

a) How could he set them up to measure the rate at which the ice cube melts?

b) What other item of apparatus does he need to measure the rate of melting?



● CHAPTER 8

c) How do you think Jamil carried out his investigation?

d) How could Jamil use this technique to investigate the effect of temperature on melting? _____



6 Mary measured the time it took for a drop of water to evaporate at different temperatures.

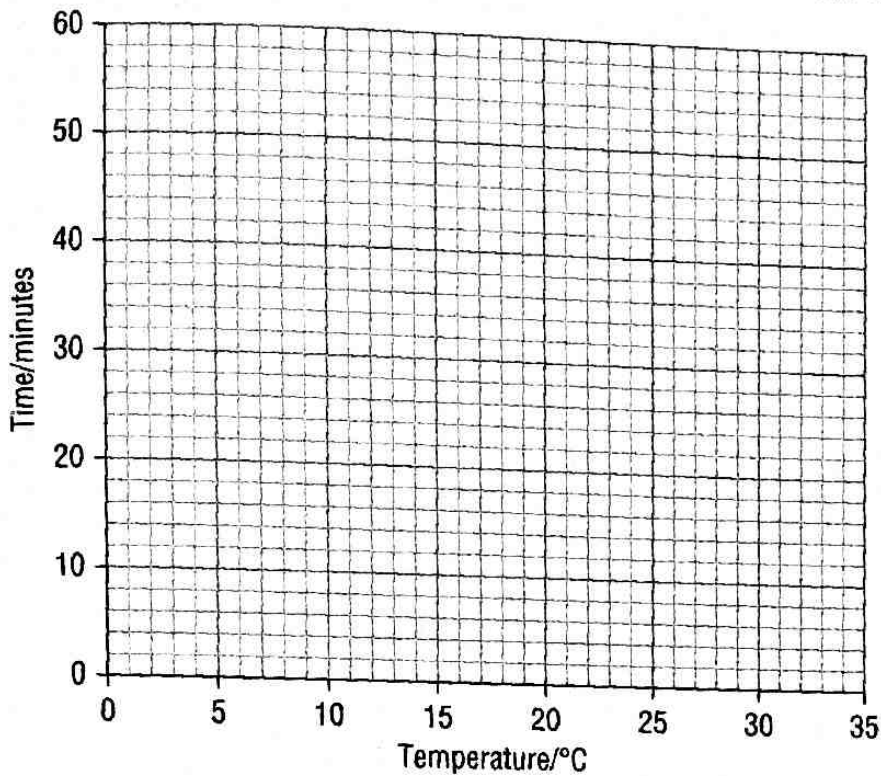
a) How do you think she made the test fair? _____

b) What happens to the mass of a liquid as it evaporates?

She recorded her data in a table.

Temperature/°C	Time to evaporate/minutes
5	60
10	44
15	40
20	36
25	20
30	10

- c) Plot the data on the graph below but do not draw a line between the points.



- d) Join the points very lightly in pencil and describe the line that is produced.

- e) Scientists deal with graphs like this by drawing a line of best fit – one that shows best the trend seen in the data. Look at the points again and draw a straight line of best fit in ink on the graph.

- f) What do you think Mary concluded from the investigation?

Diffusion

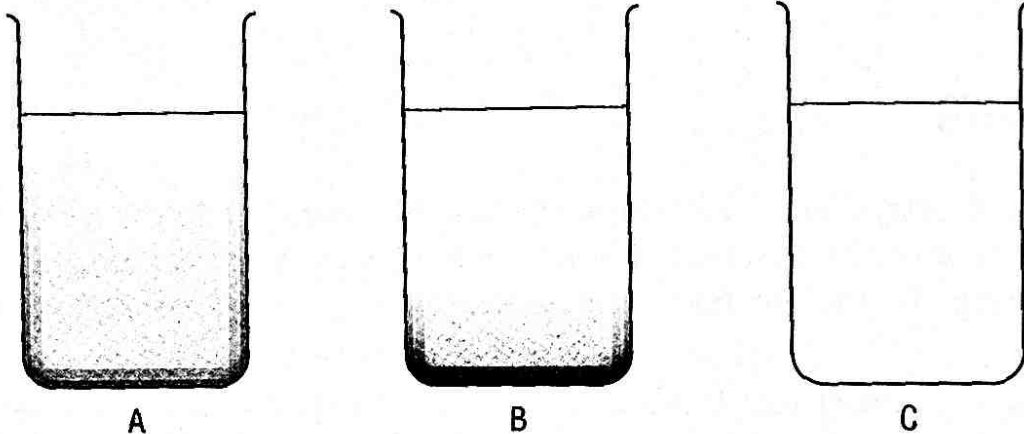


9 Adya is investigating the effect of temperature on diffusion. She is using water and ink in her investigations.

a) How do you think she will make her test fair?

b) How will she check that the water is at different temperatures?

The diagrams A and B show water and ink mixtures at different temperatures 2 minutes after Adya added the two liquids together.



c) (i) Which one do you think was at the higher temperature? _____

(ii) Explain your answer. _____

d) In beaker C draw how the two liquids will appear when diffusion is complete.