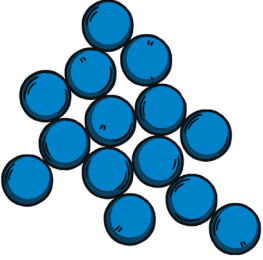
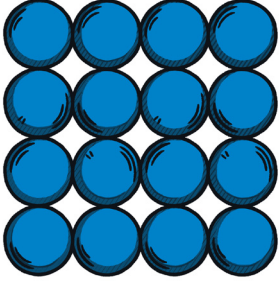
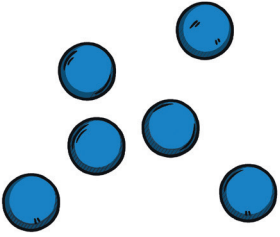




Particulate Nature of Matter

There are three main states of matter: solids, liquids, and gases.

1. Label each of the particle arrangements shown below. Use the words **solid**, **liquid** and **gas**.

		
_____	_____	_____

The structure and arrangement of the particles determine the properties of each state of matter.

2. Complete the table by ticking or crossing the properties for each state of matter.

Property	Solid	Liquid	Gas
high density			
low density			
fixed shape			
fixed volume			
easily squashed			
flows			

Figure 1 shows the changes of state for water.

3. State what is happening at points A to E on the diagram. Use the words from the box below.

condensation evaporation freezing
melting sublimation

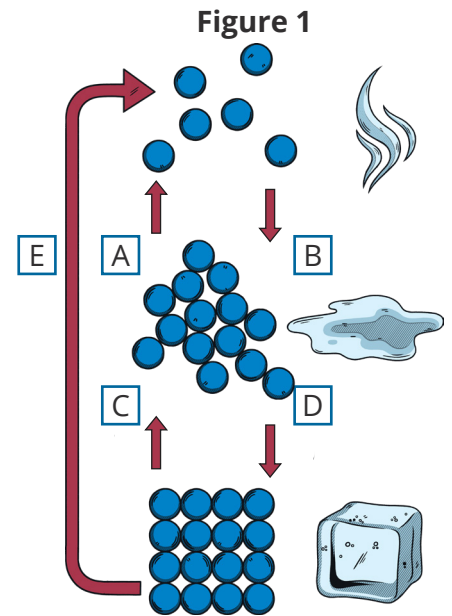
A _____

B _____

C _____

D _____

E _____



4. What type of change is occurring when a substance transforms from one state of matter to another?

5. Describe diffusion, using the words in the box.

gradient higher faster fluid energy particles
diffusion concentration kinetic equilibrium

Diffusion occurs when a _____ substance is at a _____ concentration in one region, and at a lower concentration in another region. This difference in _____ is called the concentration _____.

When _____ is transferred to a substance by heating, the _____ energy of the particles increases. The more kinetic energy the particles have, the _____ they move around. Faster movement increases the rate of _____.

A higher concentration gradient will also cause _____ to diffuse more quickly, from the higher concentration to the lower concentration, until they reach _____.

6. State **two** factors which would increase the rate of diffusion.

factor 1 _____

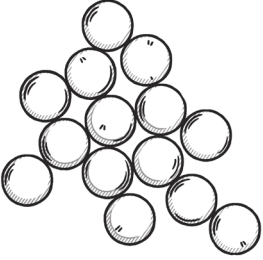

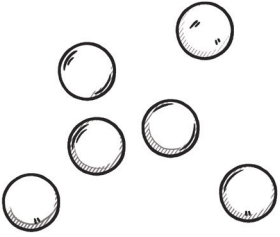
factor 2 _____



Particulate Nature of Matter **Answers**

There are three main states of matter: solids, liquids, and gases.

1. Label each of the particle arrangements shown below. Use the words **solid**, **liquid** and **gas**.

		
liquid	solid	gas

The structure and arrangement of the particles determine the properties of each state of matter.

2. Complete the table by ticking or crossing the properties for each state of matter.

Property	Solid	Liquid	Gas
high density	✓	✓	✗
low density	✗	✗	✓
fixed shape	✓	✗	✗
fixed volume	✓	✓	✗
easily squashed	✗	✗	✓
flows	✗	✓	✓

Figure 1 shows the changes of state for water.

3. State what is happening at points A to E on the diagram.
Use the words from the box below.

condensation	evaporation	freezing
melting		sublimation

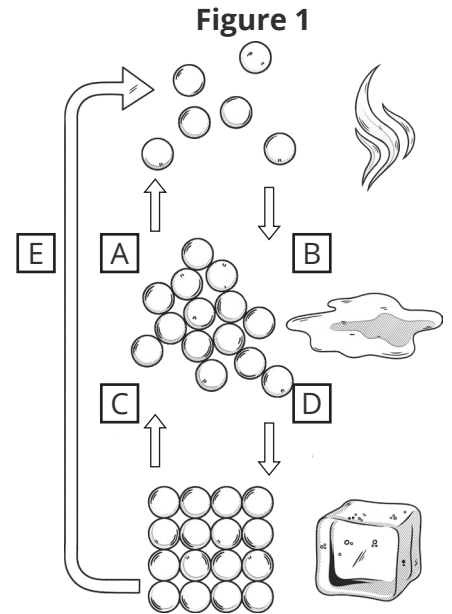
A evaporation

B condensation

C melting

D freezing

E sublimation



4. What type of change is occurring when a substance transforms from one state of matter to another?

physical change

5. Describe diffusion, using the words in the box.

gradient	higher	faster	fluid	energy	particles
diffusion		concentration	kinetic		equilibrium

Diffusion occurs when a **fluid** substance is at a **higher** concentration in one region, and at a lower concentration in another region. This difference in **concentration** is called the concentration **gradient**.

When **energy** is transferred to a substance by heating, the **kinetic** energy of the particles increases. The more kinetic energy the particles have, the **faster** they move around. Faster movement increases the rate of **diffusion**.

A higher concentration gradient will also cause **particles** to diffuse more quickly, from the higher concentration to the lower concentration, until they reach **equilibrium**.

6. State **two** factors which would increase the rate of diffusion.

Accept any two from:

- **increased temperature/kinetic energy**
- **increased concentration gradient**
- **increased surface area**
- **increase mass of solute**