

Name _____ Date _____

1B: States of matter

1 Explain the difference in properties of solids, liquids and gases by completing this table.

	State of matter		
Property	Solid	Liquid	Gas
	Lowest	Middle	Highest
Movement			
	Does not change		Particles fill the entire container
Arrangement		Particles are close together but no regular ordering	
Density			Very low – smaller number of particles cover a large area

2 Complete the diagram in Figure 1.1 to show what happens to particles at different changes of state.

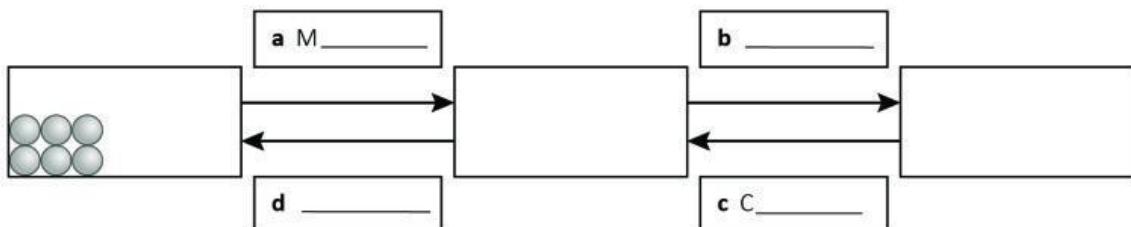


Figure 1.1

3 Explain the following energy changes:

Think about the terms endothermic and exothermic and intermolecular forces. Consider what is happening to the kinetic energy of the particles.

a Liquid turning into a solid.

b Liquid turning into a gas.

4 This question relates to the physical states of elements at different temperatures.

Element	Melting point (°C)	Boiling point (°C)
Hydrogen	-259	-253
Oxygen	-218	-183
Iron	1538	2861
Magnesium	650	1090
Sulfur	115	445
Carbon	3550	4027
Neon	-249	-246

a Which elements are a solid at 200 °C?

There are three.

b Which elements are a gas at 1500 °C?

There are five.

c What state is neon in at -250 °C?

Think about whether -250 is higher than -249.

d What state is oxygen in at -200 °C?

Think about whether -200 is higher than -183.

5 This question relates to how changes of state of a substance can be represented graphically.

a Complete the labels on the graph in Figure 1.2.

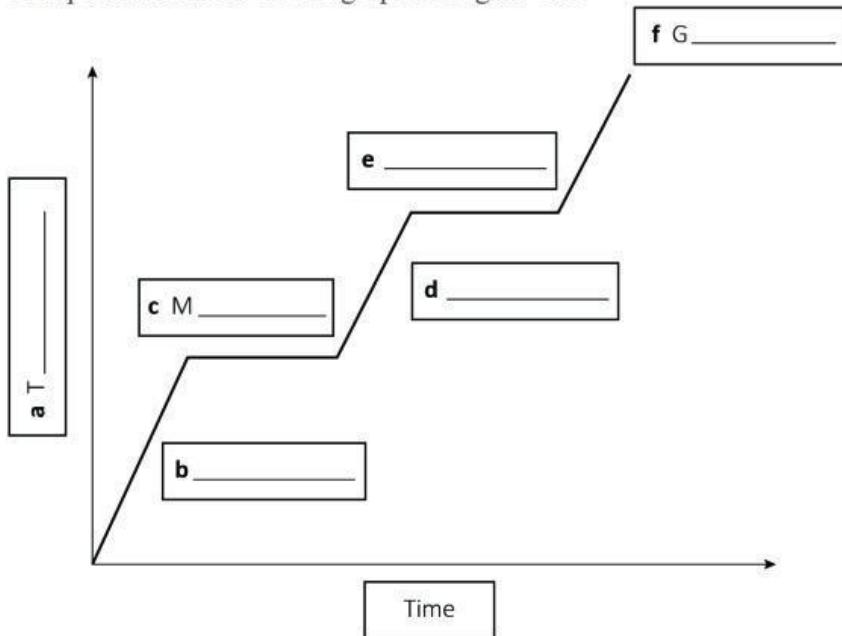


Figure 1.2

b Explain the increase in temperature at points b and d.

Think about kinetic energy.

c Explain why there is no change at points c and e.

Think about intermolecular forces.

d How can you tell from the graph that the substance is pure?

Think about why salt is placed on icy roads.

6 This question relates to diffusion.

a Explain the term *diffusion*.

Include the words particles and concentration in your answer.

b Complete the diagram in Figure 1.3 to show how bromine liquid can be used to explain diffusion.

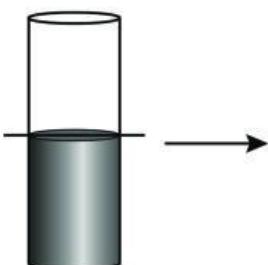


Figure 1.3

c Give **two** factors that can affect the rate of diffusion.

Think about how particles are more likely to move from one place to another more quickly.
