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.

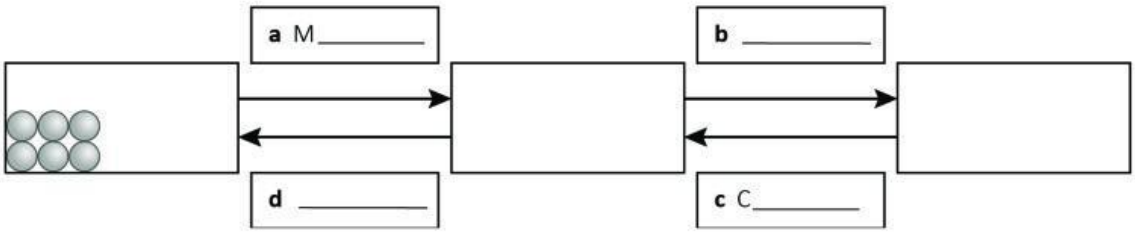


Figure 1.1

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.

_____

LIVEWORKSHEETS

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.

_____

LIVEWORKSHEETS

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.

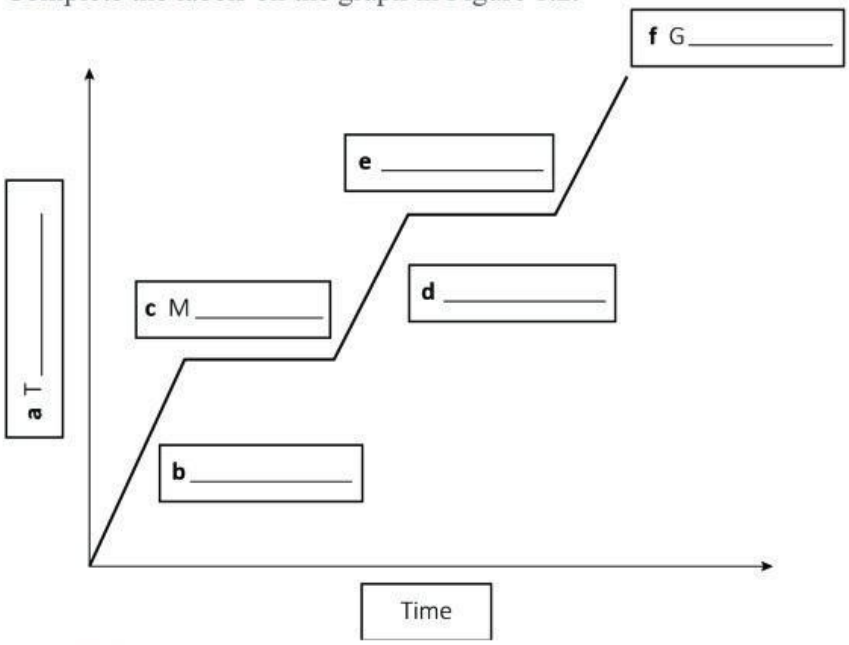


Figure 1.2

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.

LIVEWORKSHEETS

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

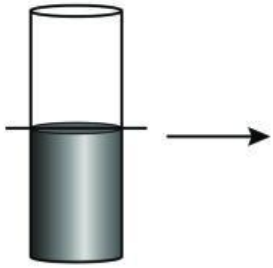


Figure 1.3

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.

LIVEWORKSHEETS