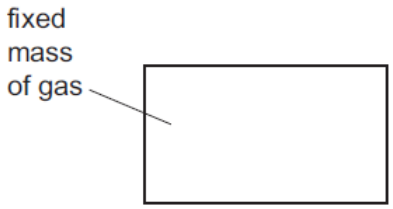
Kinetic Molecular of Matter – 2022 November IGCSE

1. Nov/2022/Paper_11,21/No.12

A fixed mass of gas is trapped in a container. The temperature of the gas is increased but the volume of the gas is kept constant.



How does this change affect the average kinetic energy of the molecules and the pressure on the walls of the container?

	average kinetic energy	pressure
A	increases	increases
B	stays the same	increases
C	increases	decreases
D	decreases	increases

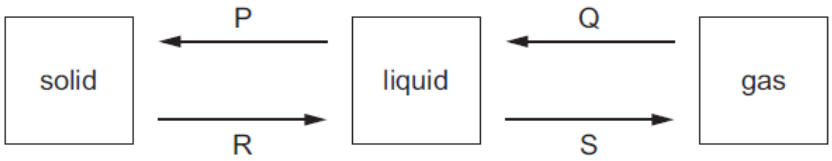
2. Nov/2022/Paper_11/No.13

Which row correctly describes the arrangement and the motion of particles in a solid?

	arrangement of particles	motion of particles
A	far apart	moving randomly from place to place
B	far apart	vibrating about one position
C	tightly packed	moving randomly from place to place
D	tightly packed	vibrating about one position

3. Nov/2022/Paper_11/No.15

In the diagram, each box represents a state of matter and each arrow represents a change of state.



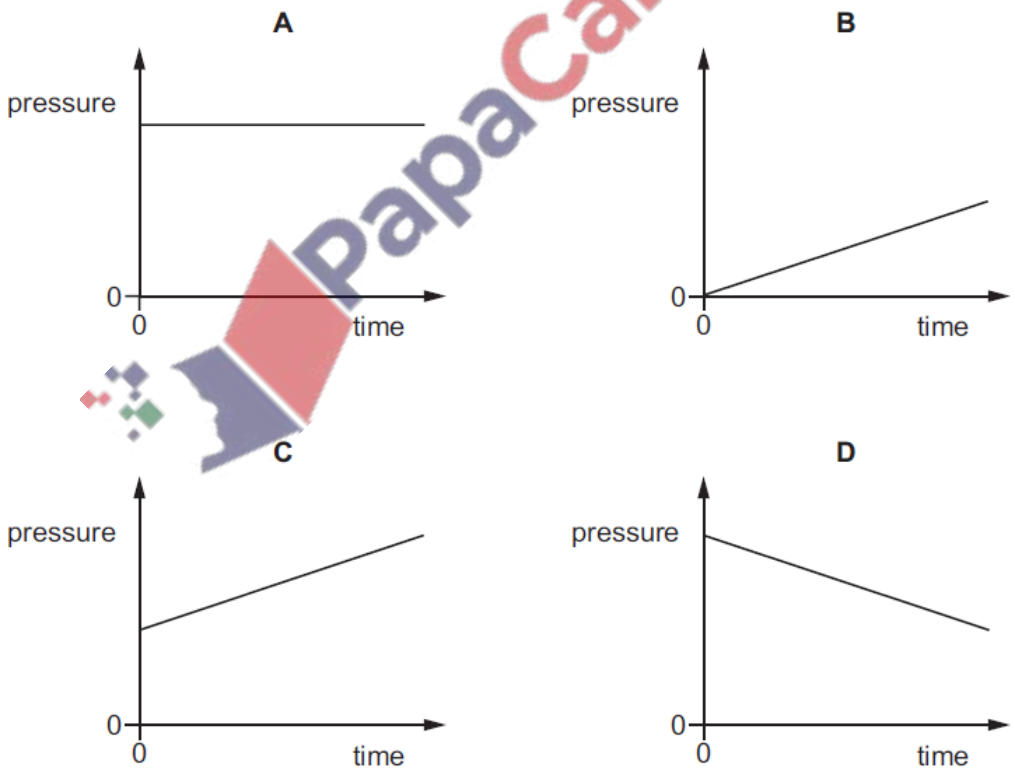
Which row correctly identifies the changes of state?

	P	Q	R	S
A	freezing	condensation	boiling	melting
B	boiling	melting	condensation	freezing
C	freezing	condensation	melting	boiling
D	condensation	freezing	melting	boiling

4. Nov/2022/Paper_12,13,22,23/No.12

The pressure of a fixed mass of gas in a cylinder is measured. The volume of the gas in the cylinder is slowly decreased. The temperature of the gas does not change.

Which graph shows how the pressure of the gas changes during this process?



5. Nov/2022/Paper_12/No.13

Which statement about the motion of molecules describes the process of evaporation?

A Molecules break free from their fixed positions.

B Freely moving molecules collide and join together.

C Molecules escape from the surface of a liquid.

D Freely moving molecules gain energy and move further apart.

6. Nov/2022/Paper_13/No.13

A liquid is evaporating.

What does it lose from its surface?

A less energetic ions

B less energetic molecules

C more energetic ions

D more energetic molecules

7. Nov/2022/Paper_21/No.13

Which row correctly describes boiling and evaporation of water?

	boiling	evaporation
A	bubbles seen	occurs at surface only
B	bubbles seen	occurs throughout the water
C	no bubbles	occurs at surface only
D	no bubbles	occurs throughout the water

8. Nov/2022/Paper_22/No.13

Wet clothes are hanging outside to dry.

What are the best conditions for the clothes to dry most quickly?

	wind speed	temperature
A	high	high
B	high	low
C	low	high
D	low	low

9. Nov/2022/Paper_23/No.13

Which statement about evaporation is correct?

A A body in contact with an evaporating liquid loses thermal energy.

B A decrease in the surface area of an evaporating liquid increases the rate of evaporation.

C A wind over a liquid decreases the rate of evaporation.

D It is necessary to provide an external source of thermal energy to a liquid for it to evaporate.

10. Nov/2022/Paper_31/No.5(b)

(b) Some gas is trapped in a cylinder fitted with a moveable piston. Fig. 5.2 shows the arrangement.

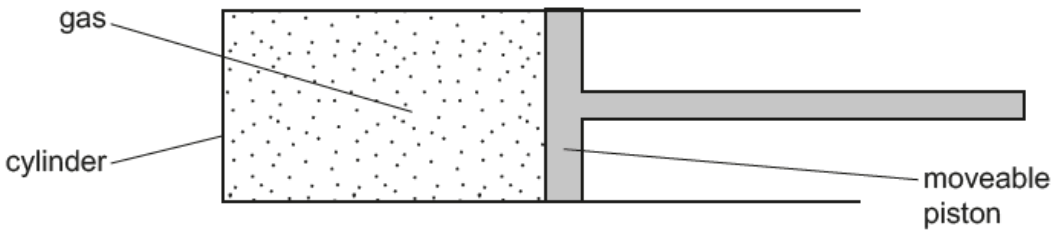


Fig. 5.2

(i) Describe how the gas exerts a pressure on the cylinder.

Use your ideas about molecules.

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..... [2]

(ii) The piston moves and increases the volume occupied by the gas. The temperature of the gas remains constant. Fig. 5.3 shows the new position of the piston.

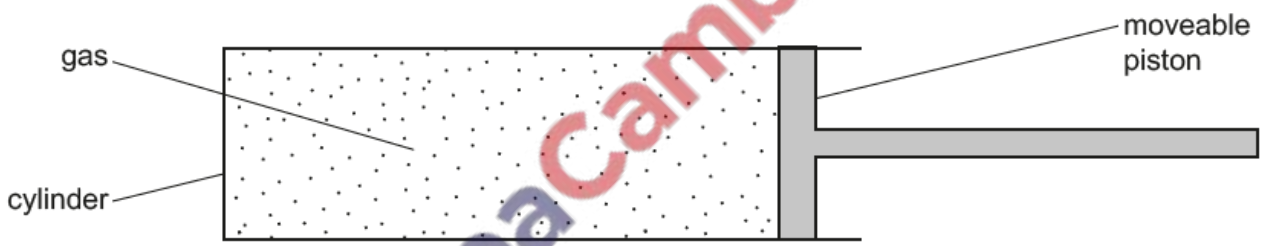

Fig. 5.3

State and explain what happens to the pressure of the gas on the cylinder.

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..... [2]

11. Nov/2022/Paper_32/No.4(a)

Fig. 4.1 shows students walking to school. There are puddles of water on the ground.

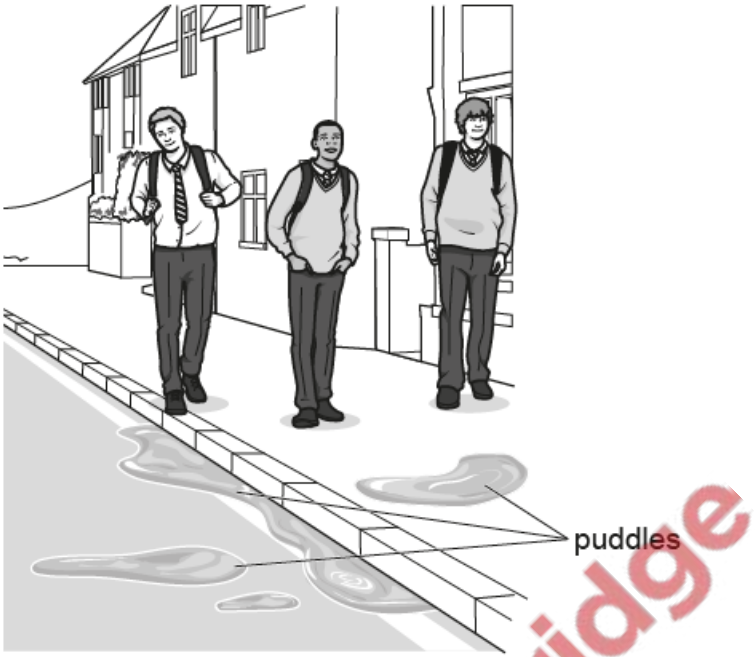

Fig. 4.1

After school, the puddles have disappeared and the ground is dry.

(a) (i) State the name of the process that causes the puddles to disappear.

..... [1]

(ii) Describe the process that causes the puddles to disappear.
Use your ideas about molecules.

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..... [3]

12. Nov/2022/Paper_33/No.4(c)

(c) Describe the arrangement and movement of the molecules in a solid and in a gas. Write your answer in Table 4.1.

Table 4.1

	solid	gas
arrangement of molecules	.....	.....
	.....	.....
	.....	.....
	.....	.....
movement of molecules	.....	.....
	.....	.....
	.....	.....
	.....	.....

[4]

13. Nov/2022/Paper_41/No.4(c, d)

(c) When the temperature reaches –18 °C, the pressure of the gas in the cylinder is still equal to that of the atmosphere.

Explain, in terms of the particles of the gas, how the pressure remains equal to its original value.

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..... [3]

(d) As the temperature of the metal cylinder decreases, the volume of the metal decreases. The decrease in the volume of the metal is much less than the decrease in the volume of the gas.

Explain, in terms of the particles of the metal, why the decrease in the volume of the metal is less than that of the gas.

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..... [2]