
	INDIAN SCHOOL AL WADI AL KABIR		
CLASS: VIII	DEPARTMENT: SCIENCE 2025 - 26	DATE: 07/11/2025	
WORKSHEET NO: 8 WITH ANSWERS	TOPIC: PARTICULATE NATURE OF MATTER	NOTE: A4 FILE FORMAT	
NAME OF THE STUDENT:	CLASS & SEC:	ROLL NO.	

I. OBJECTIVE-TYPE QUESTIONS:

- Diffusion in gases is faster than in liquids because:
 - Gas particles are closer together
 - Gas particles do not move
 - Gas particles move faster and have more space
 - Gas particles are heavier
- A metal rod is placed over a flame and heated continuously. Initially, it becomes hot and starts glowing. After some time, the solid metal begins to lose its shape and turns into a liquid form. What causes the melting of the metal rod?
 - Increase in interparticle attraction
 - Particles become stationary
 - Vibrations weaken the attractive forces between particles
 - Particles lose energy
- A grain of potassium permanganate was dropped into a glass of water. Over time, the water turned uniformly pink without stirring. The teacher explained that this was due to the movement of water particles. What does this observation suggest about the behaviour of particles in liquids?
 - Particles in liquids are fixed in place
 - Particles in liquids move randomly and help in mixing
 - Potassium permanganate is heavier than water
 - Water particles are destroyed during mixing

4. A student poured 200 mL of water into three containers of different shapes. In each case, the water took the shape of the container, but the volume remained the same. Which property of liquids is best demonstrated by this activity?
- (a) Liquids have fixed shape and volume
 - (b) Liquids are compressible
 - (c) Liquids have no volume or shape
 - (d) Liquids have fixed volume but no fixed shape
5. After blowing out a candle, Aarav observed solid wax at the base, liquid wax near the wick, and vapour rising. His teacher showed him a diagram of particle arrangements in solids, liquids, and gases. Which of the following correctly matches the states of wax with particle arrangement?
- (a) Solid – loosely packed; Liquid – tightly packed; Gas – fixed
 - (b) Solid – free to move; Liquid – fixed; Gas – vibrating
 - (c) Solid – tightly packed; Liquid – loosely packed; Gas – free to move
 - (d) Solid – vibrating; Liquid – stationary; Gas – compressed
6. Riya experimented by adding some sugar to a glass of water. She marked the water level before and after stirring. After the sugar had completely dissolved, she observed that the water level had slightly decreased. What is the reason for the decrease in water level after sugar dissolves?
- (a) Sugar evaporates
 - (b) Sugar particles occupy interparticle spaces
 - (c) Water particles disappear
 - (d) Sugar turns into a gas
7. Arun placed some solid iodine in a closed gas jar and left it undisturbed for a while. After some time, he observed a purple-coloured vapour filling the jar. What process is responsible for the formation of iodine vapour in the jar?
- (a) Condensation
 - (b) Sublimation
 - (c) Evaporation
 - (d) Melting

For question numbers 8-10, two statements are given- one labelled Assertion (A) and the other labelled Reason (R). Select the correct answer to these questions from the codes (i), (ii), (iii) and (iv) as given below -

- i) Both A and R are true, and R is the correct explanation of the assertion.
- ii) Both A and R are true, but R is not the correct explanation of the assertion.
- iii) A is true, but R is false.
- iv) A is false, but R is true

8. **Assertion (A):** The melting point of iron is higher than that of ice.

Reason (R): The interparticle forces in iron are weaker than in ice.

9. **Assertion (A):** When sugar is added to water, the water level first increases and then decreases after the sugar dissolves.

Reason (R): Sugar particles occupy the spaces between water particles when they dissolve.

10. **Assertion (A):** Heating increases the movement of particles in matter.

Reason (R): Heating changes the state of matter from solid to liquid and liquid to gas.

II. VERY SHORT ANSWER TYPE QUESTIONS (2M):

1. What is a constituent particle?

[Hint: A constituent particle is the basic unit that makes up a larger piece of a substance or material.]

2. What happens to the particles of a solid when it is heated?

[Hint: When a solid is heated, its particles vibrate faster, weakening the forces between them and eventually changing the solid into a liquid.]

3. What is meant by the term 'interparticle attraction'? **[Hint: It is the force of attraction that holds the particles of matter together.]**

4. Why do liquids take the shape of the container but solids do not?

[Hint: Liquids have weaker interparticle attraction, allowing particles to move past one another. Solids have strong attractions and fixed particle positions, maintaining a definite shape.]

5. Why does the sugar seem to “disappear” when it dissolves in water?

[Hint: Sugar seems to disappear because its particles become uniformly distributed among water particles, occupying the spaces between them, forming a homogeneous solution.]

6. What is diffusion? **[Hint: Diffusion is the process of particles of a substance spreading out evenly throughout another substance, moving from an area of higher concentration to an area of lower concentration.]**

III. SHORT ANSWER TYPE QUESTIONS: (3M)

1. Explain why a solid like a block of wood is difficult to move your hand through, but you can easily move it through the air.

[Hint: A solid block of wood has particles that are tightly packed and held together by very strong attractive forces. This rigid structure makes it difficult to separate the particles. In contrast, the attractive forces in air (a gas) are negligible, and the particles are far apart, so it is easy to move your hand through them.]

2. Why do liquids take the shape of their container but maintain a fixed volume?

[Hint: The particles in a liquid are close together but can slide past one another because the attractive forces between them are weaker than in solids. This freedom of movement allows the liquid to take the shape of its container. However, the particles remain close, which is why the volume remains fixed.]

3. Why does the fragrance of an incense stick spread throughout a room?

[Hint: The burning incense stick releases gaseous particles. These particles move rapidly and randomly, colliding with the air particles and spreading out to fill the entire room. This process is called diffusion.]

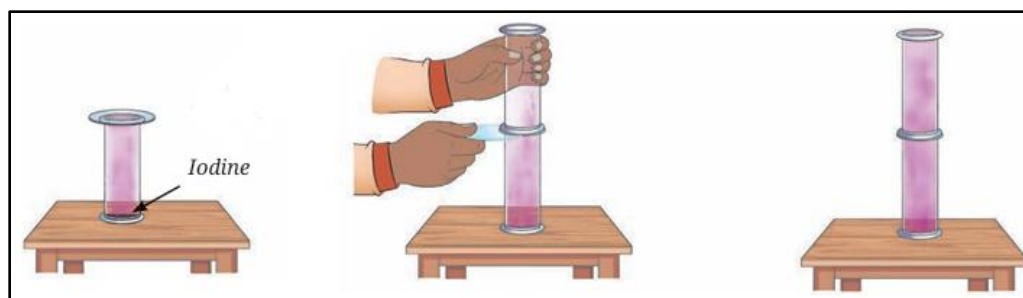
4. Explain the diffusion of potassium permanganate in water.

[Hint: When a few grains of potassium permanganate are added to water, the purple colour slowly spreads throughout the water. This happens because the particles of potassium permanganate move randomly and mix with water particles. This shows that matter is made of tiny particles that are always in motion.]

5. What happens to air when compressed in a syringe and then released?

[Hint: When air is compressed in a syringe, the air particles are forced closer together, which decreases the volume and increases the pressure. The particles move faster and collide more frequently. When the plunger is released, the compressed air expands, the particles move apart, and the air returns to its original volume and pressure. This shows that air can be compressed and also can expand.]

6. (a) What does the following activity demonstrate?



[Hint: Initially, iodine is seen as a solid at the bottom. As it sublimates, a purple vapour begins to rise and spread. Eventually, the entire jar takes on a uniform purple colour, showing that the vapour has diffused throughout.]

(b) What does the uniform colour of iodine vapour in the jar indicate about particle movement?

[Hint: It shows that the iodine particles have moved from areas of high concentration to low concentration, resulting in a uniform distribution.]

(c) Explain why iodine vapour can be used instead of incense smoke in particle motion experiments. **[Hint: Iodine vapour is preferred over incense smoke because it spreads on its own and shows how gas particles move. It doesn't need burning, so it's safer and easier to use in a closed jar. The purple colour makes it easy to see how it spreads.]**

(d) Why should we be careful while using solid iodine? **[Hint: Because iodine vapours can irritate the eyes, nose, and skin.]**

IV. LONG ANSWER TYPE QUESTIONS (5M):

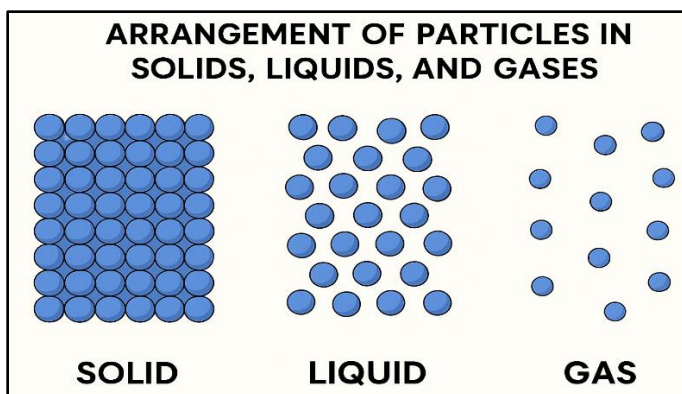
- Describe how the arrangement and motion of particles change as ice melts and transforms into water vapour. **[Hint: Ice (Solid): Particles are tightly packed in a fixed, regular pattern and can only vibrate in place.]**

Melting: When ice is heated, the particles gain energy and vibrate more vigorously. At the melting point, the vibrations become strong enough to overcome the attractive forces, and the particles break free from their fixed positions.

Water (Liquid): The particles are now disordered and can move past one another, though they remain relatively close together.

Water Vapour (Gas): Further heating causes particles to move rapidly and randomly, with the attractive forces becoming almost negligible. The particles move freely and spread out to occupy all the available space.]

- Draw and explain the arrangement of particles in solids, liquids, and gases.



[Hint: **1. Solids:**

Arrangement: Particles are closely packed in a fixed, regular pattern.

Movement: Particles vibrate in their fixed positions but do not move freely.

Properties: Solids have definite shape and definite volume because the particles cannot move from their positions.

2. Liquids:

Arrangement: Particles are close together but not in a fixed pattern.

Movement: Particles can slide past one another, giving liquids the ability to flow.

Properties: Liquids have definite volume but no definite shape; they take the shape of the container.

3. Gases:

Arrangement: Particles are far apart, and there is a lot of space between them.

Movement: Particles move freely at high speeds in all directions.

Properties: Gases have no definite shape and no definite volume; they expand to fill the container.]

V. CASE STUDY- BASED QUESTIONS/PASSAGE-BASED QUESTIONS:

Rima experimented to understand how heating affects the three states of matter. She took an ice cube and placed it in a beaker. As she heated the beaker gently, the ice began to melt. Rima noticed that even though the temperature stayed constant at the melting point for some time, the ice continued to turn into water. Her teacher explained that the heat energy was being used to overcome the strong forces of attraction between the solid particles, allowing them to move out of their fixed positions and become liquid.

When Rima further heated the water, she observed bubbles forming and escaping as steam. The teacher explained that now the water particles had gained enough energy to completely overcome the attractive forces and move freely in all directions — a gaseous state. Rima concluded that in

solids, particles are tightly packed with very little movement, in liquids, they move more freely but stay close together, and in gases, they are far apart and move rapidly in all directions.

1. What happens to the particles of a solid when it reaches its melting point?

[Hint: At the melting point, the particles of a solid gain enough thermal energy to overcome some of their attractive forces. They start moving out of their fixed positions, allowing the solid to change into a liquid.]

2. Why does the temperature remain constant while a solid is melting?

[Hint: The temperature remains constant while a solid is melting because the heat energy supplied is used to overcome the forces of attraction between the particles instead of increasing their temperature.]

3. Describe the arrangement and movement of particles in solids, liquids, and gases with reference to Rima's experiment.

[Hint: In solids, particles are tightly packed and can only vibrate in their fixed positions due to strong attractive forces. In liquids, the particles are close together but can slide past each other, as the forces of attraction are weaker. In gases, the particles are far apart and move freely in all directions because the forces of attraction between them are negligible. Rima's experiment showed this clearly as ice (solid) melted to water (liquid) and then boiled to form steam (gas).]

ANSWERS FOR OBJECTIVE TYPE QUESTIONS [1 to 10] -

1 - c, 2 - c, 3 - b, 4 - d, 5 - c, 6 - b, 7 - b, 8 - iii, 9 - i, 10 - ii

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