



Science

Class-VI

Chapter-7

Properties of matter and external effect

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Lecture sheet with worksheet-1

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Properties of matter: Solid, Liquid and gas

- Matter is something that takes up space.
- Everything around us is made of matter, just in different shapes and forms.
- Matter is made of tiny particles called atoms /molecules.
- Mass is the amount of matter in an object.
- Volume is how much space that matter takes up.
- Most Matters exist in three main states- solid, liquid and gas.
- Particles in any state are at constant movement and the energy they have for their movement is known as kinetic energy.
- When a solid, liquid or a gas is heated, the particles are given more kinetic energy.
- A solid object has a definite shape that doesn't change when you move it or put it in a container.
- They also have a consistent mass and volume. This is because the atoms in a solid object are packed closely together so they do not move around. A solid will change shape only if forced, for instance, if it is broken or smashed.
- Liquids have a definite volume and mass, but they do not have a definite shape.
- The atoms in liquid are still close together, but unlike the atoms in a solid, they can move around. This allows the matter in a liquid to flow.
- Because liquids don't have their own shape, they take their shape from their containers.
- The same amount of liquid may look very different in a glass and spilled on the floor.
- The third state of matter is gas. Gases have a definite mass, but they do not have a definite shape or volume. Like liquids, gases take the shape of their containers.
- Unlike liquids, gases will spread out to completely fill the container they are in. If a gas is not in a container, it will keep spreading out indefinitely.
- This is because the atoms in a gas are farther apart than atoms in a solid or a liquid, and so they can move freely
- The air you breathe is an example of a gas. You might have noticed that you can't really see air. Often gases are invisible - but they are still there. There are many different types of gases in earth's atmosphere, like oxygen, nitrogen, carbon dioxide, helium, and water vapor.

- Sometimes matter can change from one state to another. Water is a very good example of this. When water is frozen into ice, it is a solid. When it melts back into water, it is a liquid. When water evaporates into water vapor, it becomes a gas.

The comparison of the solid, liquid and gas:

Properties	Solid	Liquid	Gas
Volume	Definite	Definite	Variable, expand or contract to fill its container.
Shape	Definite	Takes up the shape of the bottom of the containers	Takes up the shape of the whole containers
Density (Closeness of particles)	Very High	Medium	Very low
Expansion on heating	Very slight	Slight	Very high
Compressibility (effect of pressure)	Negligible	Slight	Very high
Movement of particles	Vibrate in fixed position	Move about in cluster	Move about freely and always collide with each other
Attraction between the particles	Strong	Weak	Negligible
Particles Arrangement	Very closely packed regularly arranged	Closely packed Irregular arrangement	Very far apart Very irregular arrangement
Distance between particles (intermolecular space)	Almost none / Negligible	Minimal / Tiny spaces	Very large

Compressive Exercise:

These questions are about three main states of matter.

- Draw the arrangement of particles in the liquid of the beaker above.
- What is boiling and melting point?
- What is mass, volume and density?

- d) In which of the states do the particles have greatest amount of kinetic energy?
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- e) Which of the states expands the most on heating?
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- f) In Which of the states do the particles just vibrate?
.....
- g) Which of the arrangement is the most common form of water?
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Answer the following questions. The first one is answered to guide you.

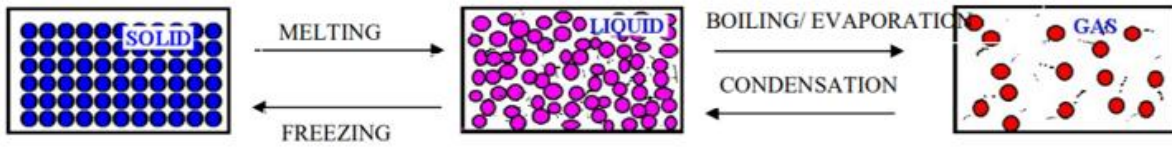
- 1. Which two of the states are similar in terms of movement? Explain your choice.
Answer: Liquid and Gas. Because Both in Liquid and Gas, the particles can move about.
- 2. Which two of the states are similar in terms of volume? Explain your choice.

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- 3. Which two of the states are opposite in terms of shape? Explain your choice.
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4. Which of the following statements is NOT true? Give a tick in the box.

- A Particles in a gas are furthest apart.
- B Particles in a liquid move in cluster.
- C Particles move faster with greater potential energy.



5. Copy the words below to answer the following questions.

[you are given some unnecessary words]

move about, decreases, very strong, kinetic energy, increases, solid, melting point, gas, moving about, strong, Very weak.

The particles in a solid are in fixed positions. They cannot.....and just vibrate without changing their positions. The attractive force among the particles is..... When heated, the vibration of the particles..... and at their..... the particles fall apart to produce a liquid and the particles start If heating is continued, the particles keep gaining, which increases their movement. At the boiling point, the particles lose their attractive force completely and the liquid turns into a