Matter and Its Composition

Chapter-1

EXERCISE

Question 1.

Define matter.

Answer:

Anything that has mass, occupies space and can be perceived by our senses is called matter.

Question 2.

What is the difference between mass and weight.

Answer:

Mass is the "quantity of matter" contained in a body and weight is "the force with which the earth pulls a body towards itself". The mass of a body does not change but its weight changes from place to place.

Question 3.

If an object weighs 6 N on earth what will be its weight on moon. What will be the change in its mass?

Answer:

Weight of body on moon = $\overline{6}$ th of its weight on earth.

 \therefore Body will weigh $\frac{1}{6}$ of $6 = \frac{1}{6} \times 6 = 1$ N on moon

Mass of a body does not change with change in gravity. So mass of a body will remain the same on moon.

Question 4.

Write your observation and conclusion for the following:

(a) When few marbles are put in a glass half filled with water.

(b) Ice is kept at room temperature.

Answer:

(a) If we take some marbles and put them into the water of glass tumbler one by one. After some time you will observe that water level crosses the mark and rises. This is because the marbles occupy space. Again if we weigh the glass with the marbles,we will find that the second mass is greater than the first one. This concludes that, marbles have mass.



This proves that, matter has mass and occupies space.

(b) Ice when kept at room temperature again changes back into liquid water. This happens because the ice cubes absorb heat energy from the surroundings and changes the state from solid to liquid.

Question 5.

State three main characteristics of the particles of matter. **Answer:**

Characteristics of particles of Matter

- 1. Particles of matter have space between them, called interparticular space.
- 2. Particles of matter are always in random motion.
- 3. Particles of matter attract each other.

Question 6.

Differentiate between an atom and a molecule. **Answer:**

Atom	Molecule
1. It is the smallest part of an element.	1. It is the smallest part of a compound.
 It may or may not not have independent existence. 	2. It has an independent existence.

Question 7.

Define :

- (a) Solid
- (b) Liquid
- (c) Gas

Answer:

Giving two examples of each type.

(a) Solid : A solid is that state of matter which has a fixed shape, mass and volume. It suffers very small changes in volume by changing the temperature. It can not be compressed. The particles are tightly packed in solids.

e.g. - Sand, Wood, Copper, Ice, etc.

(b) Liquid : It has a definite mass and volume but lacks a shape of its own. It takes up the shape of the containing vessels. It can be compressed to an extent. The particles are less tightly packed in liquids compared to solids.

e.g. - Milk, water, ink, etc.

(c) Gas : It is a state of matter which has only definite mass but no definite shape and volume. It takes up the shape of the container. The particles in gas are far apart e.g. – Carbon dioxide, oxygen, etc.

Question 8.

Why are liquids and gases called as fluids.

Answer:

The particles in liquids and gases are free to move in any direction .They can do so as the intermolecular force of attraction is weaker and intermolecular gaps are larger. All substances that can flow are called fluids and that is why liquids and gases are called fluids.

Question 9.

(a) Define interconversion of states of matter.

(b) Why do solids, liquids and gases differ in their physical state?

(c) Under what conditions do solids, liquids and gases change their state.

Answer:

(a) The process by which matter changes from one state to another and back to original state, without any change in its chemical composition, when conditions are changed.
(b) Intermolecular force of attraction and Intermolecular spaces are two important properties of matter that account for the different states of matter. If the force of attraction increases, the molecules move closer to each other and the space between them decreases. If the force of attraction decreases, the molecues move apart and space between them increases.

(c) Matter can change from one state to another on changing temperature and pressure.

Question 10.

Give reasons :

(a) When a stone is dipped in a glass containing some water the level of water rises but when a spoon of sugar is added to it and stired, the water level does not rise?(b) A drop of ink added to water in a glass turns whole water blue.

Answer:

(a)If we take half a glass of water and dip a stone in it, we will observe that the water level rises, indicating the stone occupies space.Now if we remove the stone, water comes down to its original level.

Now add a spoon of sugar to it and stir well. The sugar disappears but the level of water in the glass does not rise, that means the volume of water has not increased. But the sugar particles disappear. The sugar particles being smaller get adjusted between the water molecules. This shows that there are intermolecular space in water.

(b)This is because the water as well as ink particles (molecules) are in continuous random motion. Due to motion, the blue coloured particles of the ink spreads all over and give blue colour to the water.

Question 11.

Fill in the blanks :

- (a) Air is a matter because it has weight, mass and space and it can be compressed.
- (b) The molecules are made up of **atoms**.
- (c) The quantity of matter in an object is called its **mass**.
- (d) The state of matter with definite volume and definite shape is called **solid**.
- (e) The substances which can flow are called fluids.

Question 12.

Name the terms for the following :

- (a) The change of a solid into liquid.
- (b) The force of attraction between the molecules of matter.
- (c) The particles of matter which may or may not have independent existence.
- (d) The process due to which a solid directly changes into its vapours.

(e) The change of vapour into a liquid.

Answer:

- (a) Melting.
- (b) Intermolecular force of attraction.
- (c) Atoms
- (d) Sublimation.
- (e) Condensation.

Question 13.

Classify the following into solid, liquid and gas : Coal, kerosene, wood, oxygen, sugar, blood, water vapour, milk, wax. **Answer:**

Solids	Liquids	Gases
Coal	Kerosene	Oxygen
Wood	Milk	Water vapour
Wax	Blood	and apour
Sugar		2