**JESUS AND MARY SCHOOL AND COLLEGE**

**SUBJECT- PHYSICS**

**CHAPTER- MATTER**

**CLASS – VI WORKSHEET – 1**

**MATTER**

Matter is anything that occupies space and has weight. It includes everything from natural substances to synthetic materials. Take a piece of chalk and start breaking it into smaller pieces. Slowly and gradually, you will be able to break it into very small pieces. Finally, after sometime, the chalk piece cannot be broken further into smaller pieces. These smallest parts constitute the chalk piece. Similarly, all matter is made up of very small particles.

**COMPOSITION OF MATTER**

The indivisible building block, which all matter was composed of, came to be known as the **atom**.

Atoms of different elements are different and each has its own property. Atoms of the same elements combine to form **molecules**, while atoms of different elements react to form **compounds**. According to these early Greeks, matter could not be continuously broken down and divided indefinitely. Rather, there was a basic unit or building block that was indivisible and foundational to its structure.

**ATOMS**

1. An atom is defined as the smallest particle of an element that can exist.
2. Atoms are the building blocks of all matter.
3. All matter, living or non-living, is made up of atoms.
4. Atoms are so small that we cannot see them without the help of electron microscopes.
5. Each element is made up of its own type of atom.
6. The atoms of different elements are different in sizes.

**MOLECULES**

1. A molecule is made up of two or more atoms of the same kind or of different kinds of chemically combined together.
2. Molecules exist in both elements and compounds.
3. Molecules in elements consist of a fixed number of one kind of atom only.
4. In some cases, three identical atoms may combine to form a molecule, as in the ozone molecule which is made up of three oxygen atoms.
5. Molecules in compounds consist of a fixed number of two or more different kinds of atoms chemically combined together.

**KINETIC THEORY OF MATTER**

1. Matter is composed of tiny particles called molecules. All molecules of a particular substance are similar in all respects.
2. The molecules of a substance are in a state of random motion.
3. There is intermediate space between the molecules of a substance.
4. Forces of attraction exist between molecules.

**STATES OF MATTER**

There are 3 fundamental states of matter, i.e., solid, liquid and gas. The states of matter exist due to variations in the arrangement of the molecules of matter

1. **A solid** has a definite shape that is not easy to change. A solid will retain shape unless it is cut, squeezed, crushed or melted. Different solids have particular properties such as stretch, strength, or hardness that make them useful for different jobs. Most solids are made up of tiny crystals. This is because their particles are arranged in a regular pattern, called a crystalline structure. **Examples-** wood, sand, ice, brick, steel etc.
2. **A liquid** is a free-flowing substance of a constant volume having consistency. It is a type of matter which does not have a shape but takes the shape of the vessel in which it is held. So, a liquid has a fixed volume but no fixed shape. **Examples-** water, blood, wine, petrol, coffee, tea etc.
3. **A gas** is described as a state of matter which diffuses freely in all directions and fills the entire space available, regardless of its quantity. **Examples-** leakage from an LPG cylinder, which you can smell in the kitchen. So, a gas has neither a fixed shape nor a fixed volume. Most of the gases are colourless and, hence, difficult to observe. Unlike solids and liquids, we cannot hold a gas. We usually say that containers without solid or liquid content are empty. In fact, they are full of air, which is a mixture of gases. Some common examples of gases are oxygen, hydrogen, helium, propane, water vapour and gaseous nitrogen.

**DIFFERENCES BETWEEN SOLIDS, LIQUIDS AND GASES**

**SOLIDS:**

1. Particles are tightly packed, usually in a regular pattern.
2. Solids have a fixed volume and shape.
3. There are strong forces of attraction between the molecules of a solid. This force is called **intermolecular force.** This is the reason why solids retain their shape.
4. Particles of solid vibrate about their mean position but generally do not move from place to place.
5. Solids, because of their rigid shape, are not easily compressed. The molecules of a solid are so closely arranged that there is very little free space between them
6. Solids do not flow easily because the molecules in a solid are packed so tightly that they cannot slide past one another.

**LIQUIDS:**

1. Particles or molecules are close together with no regular arrangement.
2. Liquids do not have a definite shape. They take the shape of the container. Liquids have a definite volume and a minimum surface area.
3. The force of attraction between the molecules of a liquid is weaker than those of solids. In liquid state, molecules can move about freely in a random, zig-zag motion throughout the bulk of the liquid. This is the reason why liquids do not have a definite shape.
4. Particles of a liquid vibrate and move about varying kinetic energy because the force of attraction between the liquid molecules is not strong enough to keep them in place.
5. Liquids cannot be compressed easily because there is not much free space between the particles of a liquid.
6. Liquids flow because their molecules can slide or move past one another.

**GASES:**

1. The particles are well separated from one another with no regular movement.
2. A gas does not possess a definite shape, has no definite volume or exerts pressure on the walls of the container.
3. The particles of a gas vibrate and move freely at high speed. There is rapid, random motion in all possible directions. During their motion, the molecules collide with one another.
4. There is very little force of attraction between the molecules of a gas, which is why gases do not have a definite shape and volume.
5. A gas can be easily compressed. Its volume can be compressed to several times its original volume. This is because the distance between the molecules of a gas is very large.
6. A gas can flow because its molecules can move past one another.

**Q 1. Fill in the blanks.**

1. All the molecules of a substance are \_\_\_\_\_\_\_\_\_\_.
2. The intermolecular spacing is \_\_\_\_\_\_\_\_\_\_\_ in solids \_\_\_\_\_\_\_\_\_ in gases.
3. The molecular motion in liquid and gas in \_\_\_\_\_\_\_\_\_\_path.
4. A solid is \_\_\_\_\_\_\_\_\_ rigid.
5. The gases are \_\_\_\_\_\_\_\_\_ dense.

**Q 2. True or False**

1. In a gas, the molecules can move anywhere in space.
2. The molecules in a liquid substance are in random motion.
3. Intermolecular forces are effective at all.
4. We cannot hold a gas in our hand.
5. Petrol is an example of a liquid.

**Q 3. Answer the short questions.**

1. Name a gas which we use in our kitchen.
2. Give any two examples of solid.
3. What is matter?
4. Write any two properties of liquid.
5. What are intermolecular forces?

**NOTE: Please do this work in your old copies which will be checked when the school reopens. Please consider this important.**