COMPOSITION OF MATTER

Matter around us consists of substances combined together in different forms. A substance having fixed chemical properties (changes observed when a substance reacts with other substances) and fixed physical properties (colour, taste, smell, state, boiling and melting points) is called a pure substance. A pure substance can be an element or a compound.

Elements

An element is a substance that cannot be broken into simpler substances by a chemical process. There are 118 known elements. Gold, silver, iron, sodium, sulphur, magnesium, phosphorus, potassium and carbon are some common elements. An element consists of very small particles called atoms. An atom can be defined as the smallest unit of an element having all the characteristics of that element.
DID YOU KNOW???
Liquids such as honey, coconut oil, animal fat (desi ghee) are sticky and difficult to pour out. It is because, there is more friction between the layers of the molecules of these liquids. Such liquids are called viscous liquids.

DID YOU KNOW???
Gases on heating to tens of thousands of degree of Celsius change into another state of matter called plasma. At such a high temperature the atoms of gas break into positively and negatively charged particles.

The matter in the sun is in plasma state.

Similarly, the gases in fluorescent tube are in plasma state.

DID YOU KNOW???
A molecule is the smallest part of an element or a compound that is capable of independent existence.
Atoms combine in fixed whole numbers to form a molecule.
Terms to Know

Mass: The measure of quantity of matter contained in a substance
Solid: A state of matter that has a definite mass, shape and volume
Liquid: A state of matter that has a definite volume but no definite shape
Gas: A state of matter that neither has a definite volume nor a definite shape
Pure substance: A substance having fixed chemical and physical properties
Element: A substance that cannot be broken into simpler substances by a chemical process
Atom: The smallest unit of an element having all the characteristics of that element

Molecules: Atoms of certain elements combined together
Compound: A substance which consists of two or more elements combined together chemically in a fixed proportion
Interparticle force: The force of attraction existing between the particles in matter
Interparticle space: The distance between the particles in matter

Quick Review

- Matter is anything that has mass and occupies space.
- Solid, liquid and gas are the three states of matter.
- Solids have a definite shape, mass and volume. They are rigid and hard, and cannot be compressed. They possess high density.
- Liquids have a definite volume but no definite shape. They can flow. However, they cannot be compressed and possess low density as compared to solids.
- Gases neither have a definite shape nor a definite volume. Gases can flow and are highly compressible. They possess very low density.
- Matter around us consists of substances combined together in different forms.
- A pure substance has fixed chemical and physical properties. It can be an element or a compound.
- An element is a substance that cannot be broken into simpler substances by a chemical process.
- An element consists of very small particles called atoms. An atom is the smallest unit of an element having all the characteristics of that element.
- Atoms of certain elements combine to form molecules.
- A compound is a substance which consists of two or more elements combined together chemically in a fixed proportion.
- The particle theory of matter states that matter is made up of small particles.
- Solids have strong interparticle force of attraction between the particles. The interparticle distance is very less between the particles in solids.
- Liquids have weak interparticle force of attraction between the particles. The interparticle distance between particles in liquids is more as compared to that in solids.
- Gases have very weak interparticle force of attraction between the particles. The interparticle distance between the particles in gases is very large.
1) Answer the following questions:

i) What is a compound? Give two examples.
ii) Define pure substance? Give examples.
iii) Is water a compound? Name its constituents.
iv) Why the properties of compound are different from those of its constituent elements?
v) Define i) atom ii) chemical bond iii) interparticle force iv) interparticle space.
   v) plasma vi) viscous liquids
vi) Differentiate between an atom and a molecule. (2 points)

2) Name the terms for the following:
   a) The change of solid into liquid.
   b) The force of attraction between 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 vapour.
   e) The change of vapour into liquid.

3) Give reasons for the following:
   a) Why a solid cannot flow but can be heaped?
   b) Why are liquids and gases called fluids?
   c) Why gases fill entire space available to them?
   d) Why solids have a definite volume and definite shape?
   e) Why is a solid not compressible but a gas is?
W)