UNIVERSITY OF 8 MAY 1945-GUELMA
BEZAZ SOUAD
ENGLISH: SECOND YEAR (ST/ENGINNERS) 2023/2024 LESSON1

Nature of Matter

Anything that occupies space and has **mass** is known as **matter**. Everything around us is a form of matter. The huge buildings, bridges, electrons revolving around a nucleus, the DNA in our cells, the surrounding air, the land beneath our feet, etc. all matter. A matter is said to be composed of particles which are basically atoms and molecules. Depending upon its physical state, the nature of matter falls into three categories:

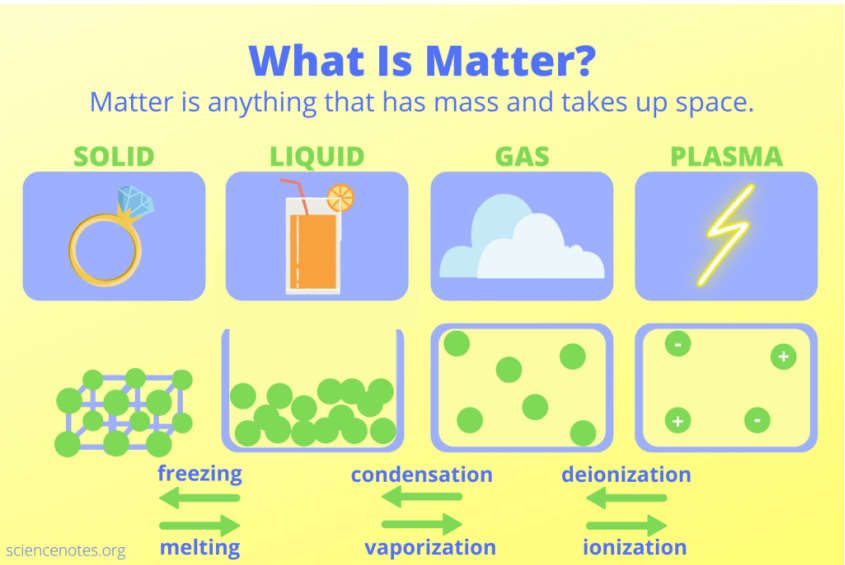
Solids: The substances in which the particles are held close to each other with strong intermolecular forces are known as solids. The particles are strongly held at their positions and have only vibratory motion. Solids have a definite shape and definite volume. **E.g.: Wood, iron, etc.**

Liquids: Those substances in which the intermolecular forces are weak enough to allow the movement of particles are known as liquids. The particles are held closely and have a higher degree of freedom than solids. Liquids have a definite volume but no definite shape; they generally take the shape of the container in which they are placed. **E.g.: water, milk, etc.**

Gases: These types of matter have very weak forces between their molecules and hence the molecules are free to move. The distance between molecules is large as compared to solids and liquids. Gases have neither a fixed shape nor a definite volume. They tend to completely occupy the container in which they are placed. **E.g. air, oxygen, hydrogen, methane, etc.**

The above three states of matter can be transformed from one form to the other by changing the conditions of temperature and pressure. The nature of matter is also determined by its composition. If the matter is composed of more than one type of particle then it is called a mixture while if it consists of a single type of particles then it is known as a pure substance. Mixtures are further classified as homogeneous and heterogeneous mixtures. Pure substances are also sub-divided as elements and compounds.

The nature of matter continues to be a vast subject of research and recent advancements have revealed other states of matter. Boson-Einstein **condensate and plasma** are the two other states of matter that have been found recently.



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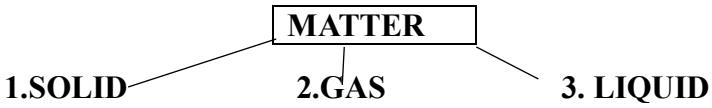
Difference Between Matter and Mass: The terms "**matter**" and "**mass**" are related, but don't mean exactly the same thing. **Mass** is a measure of the amount of **matter** in the sample. For example, you might have a block of carbon. It consists of carbon atoms (a form of matter). You could use a balance to measure the block's mass to obtain a mass in units of grams or pounds. **Mass** is a property of a sample of matter.

Classification of matter from general to specific:



Solids may be divided into two classes: **AMORPHOUS, CRYSTALLINE**

Solid examples: rubber, wood, glass, iron, cotton, sand.

Crystalline solids: rocks, wood, paper, cotton.