Matter

What is Matter?

Anything which has mass and occupies space is called matter.

For example:

Book, pen, water, air, all living and Non living things etc.

History of matter?

First time said matter made by smaller particles of wood

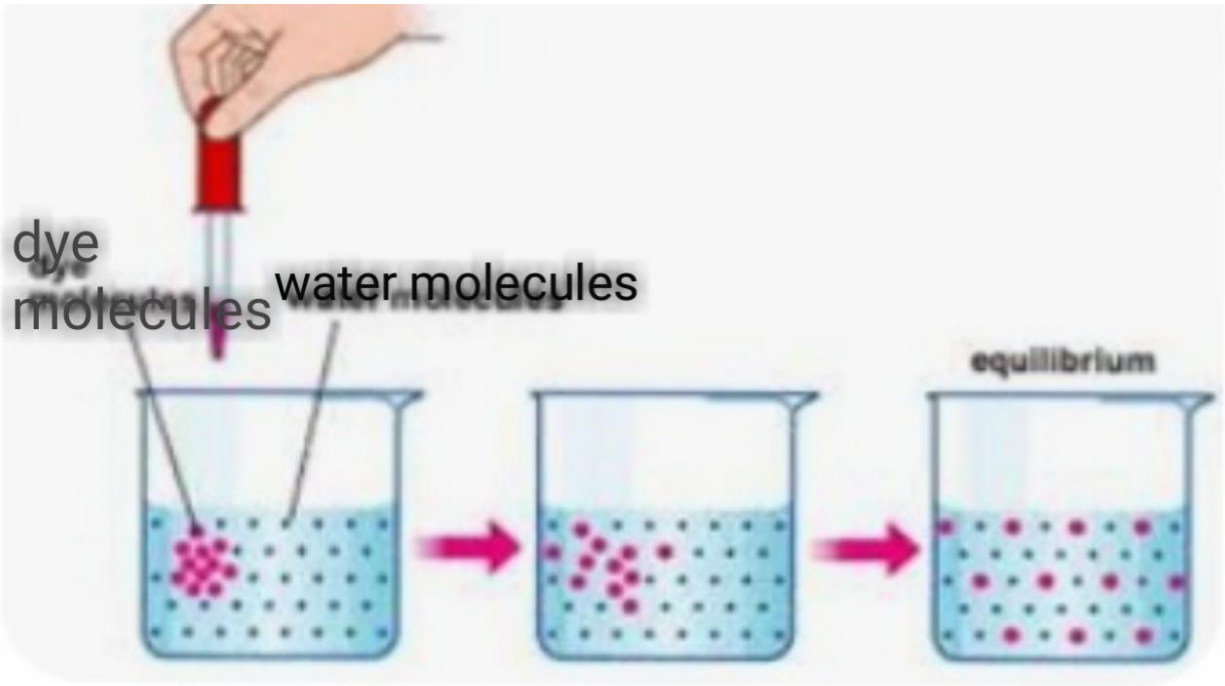
Indian Scientists in ancient India there are given five fundamental elements that are **Air, Earth, Water, Fire, Ask**

Particles: Particles is a small piece, a tiny**.**

Characteristic of particles of matter

1. particles of matter have space between them
2. particles of matter are continuously moving
3. particles of matter attract each other

1. Particles of matter have space between them



When combine of water and salt that make equilibrium of water that means water made a small particles which has space between

2. particles of matter are continuously moving

particles of matter are continuously moving that is, they possess what we call the kinetic energy. As temperature rise particles move faster. So we can say that with increase In temperature the kinetic energy of the particles also increases

3. particles of matter attract each other

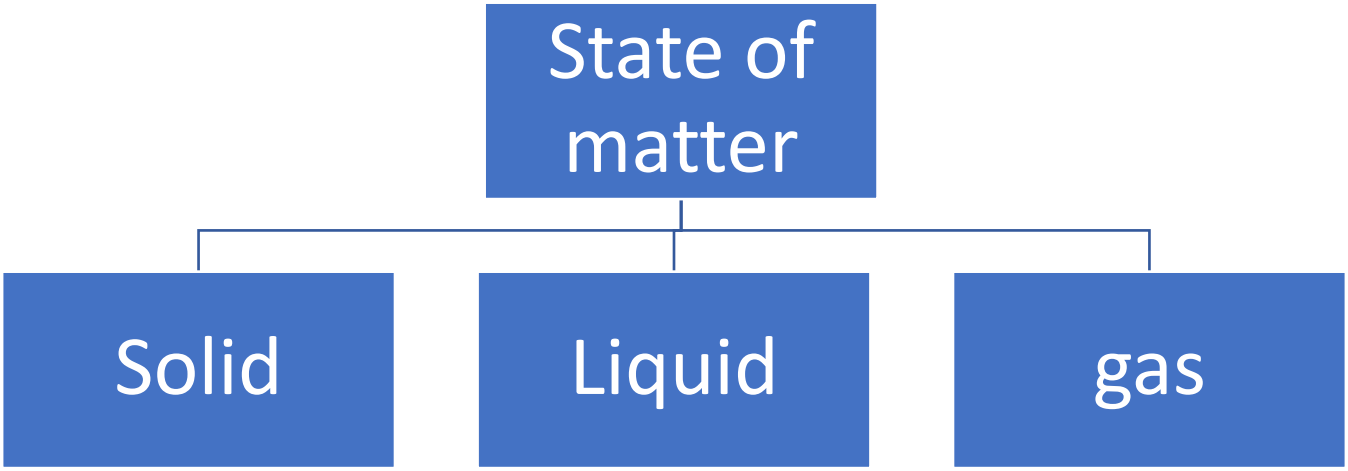
Take an iron nail, a piece of chalk and a rubber bond

Try breaking them by hammering cutting or stretching. In which of the above three substances do you things the particles are held together with grater force.

State of matter

There are five state matter that is Solid, Liquid, gas, plasma and Bore Einstein condensate.

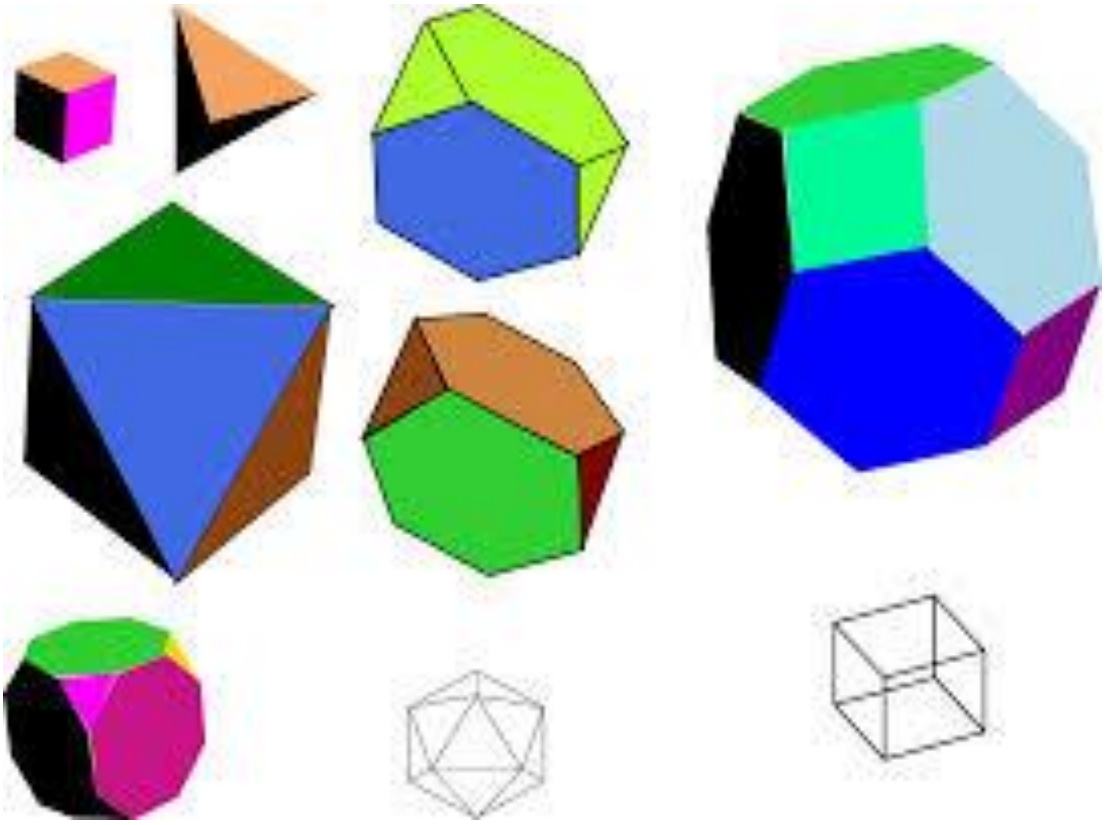
plasma and Bore Einstein condensate we learn next topic that topic **state of matter**



1. Solid

➡ Particle are held very close to each other in solids in an orderly fashion and there is not much freedom of movement.

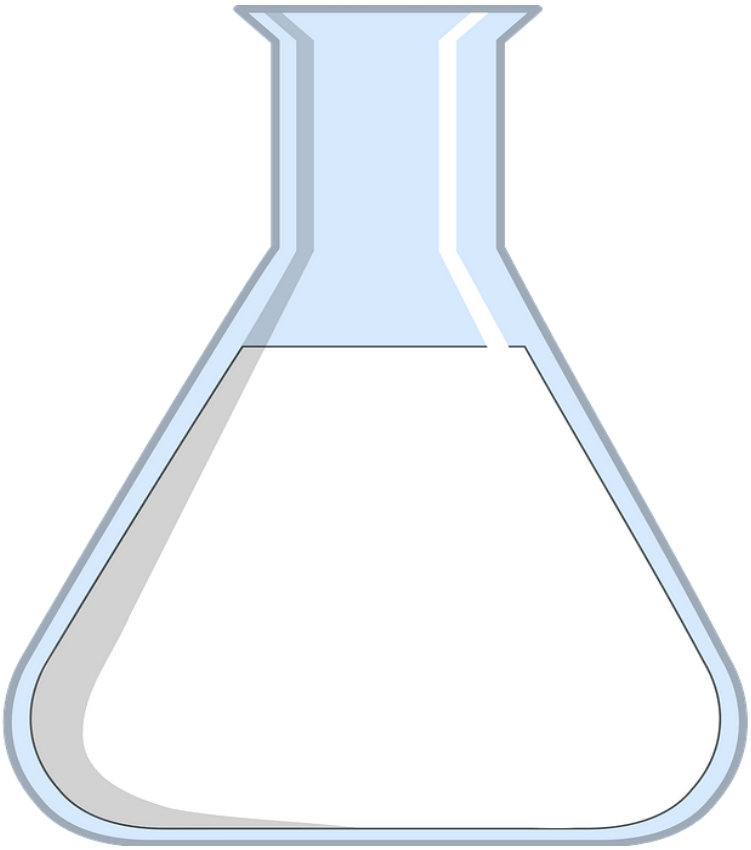
➡ Solids have definite volume and definite shape.



2. Liquid

➡ In liquids the particles are close to each other but they can move around

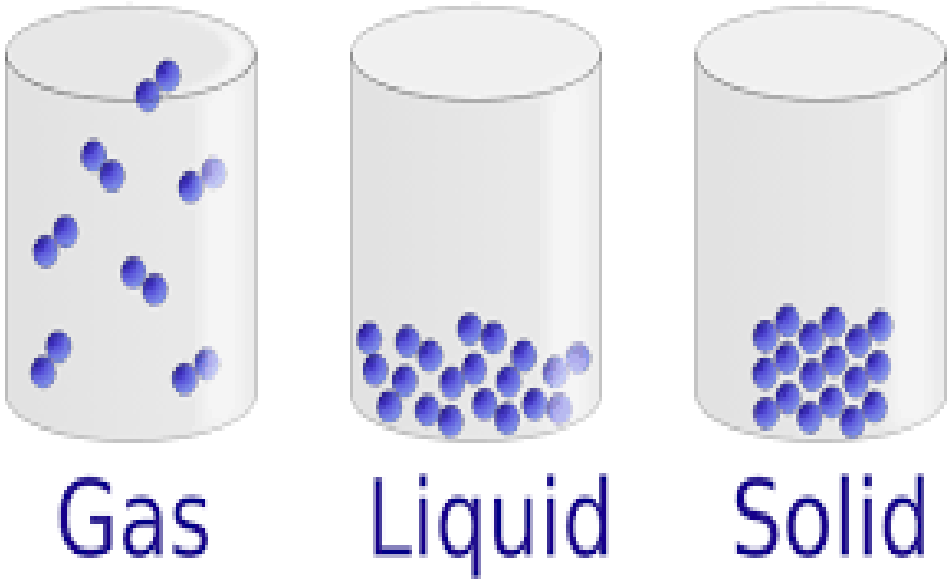
➡ Liquids have definite volume but do not have definite shape. They take the shape of the container in which they are placed.



3. Gases

➡ In gases the particles are far apart as compared to those present in solid or liquid state and their movement is easy and fast. Because of such arrangement of particles

➡ Gases have neither definite volume nor definite shape. They completely occupy the space in the container in which they are placed

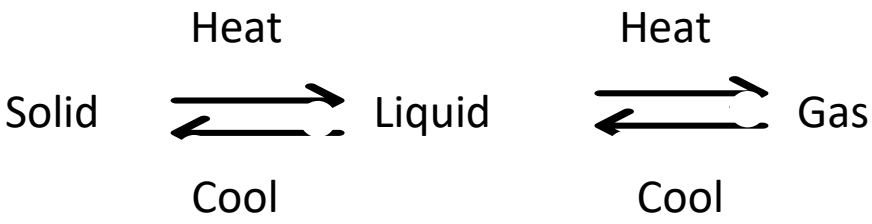


Can matter change its state

Yes there are two process to change state

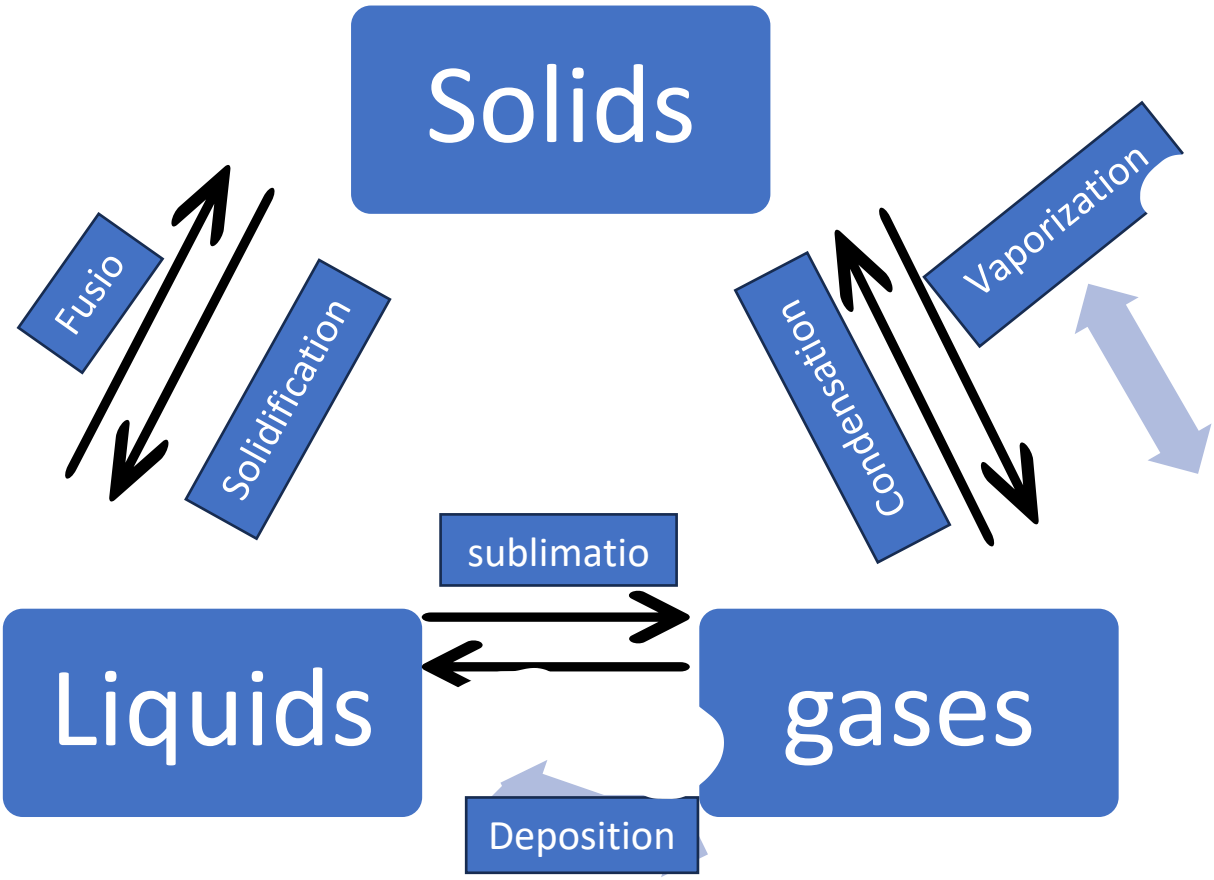
1. Effects of temperature change
2. Effects of pressure change

1. Effects of temperature change



On heating a solid usually changes to a liquid and the liquid on further heating changes to gas or vapour.
In the reverse process, a gas on cooling liquifies to the liquid and the liquid on further cooling freezes to the solid.

2. Effects of pressure change



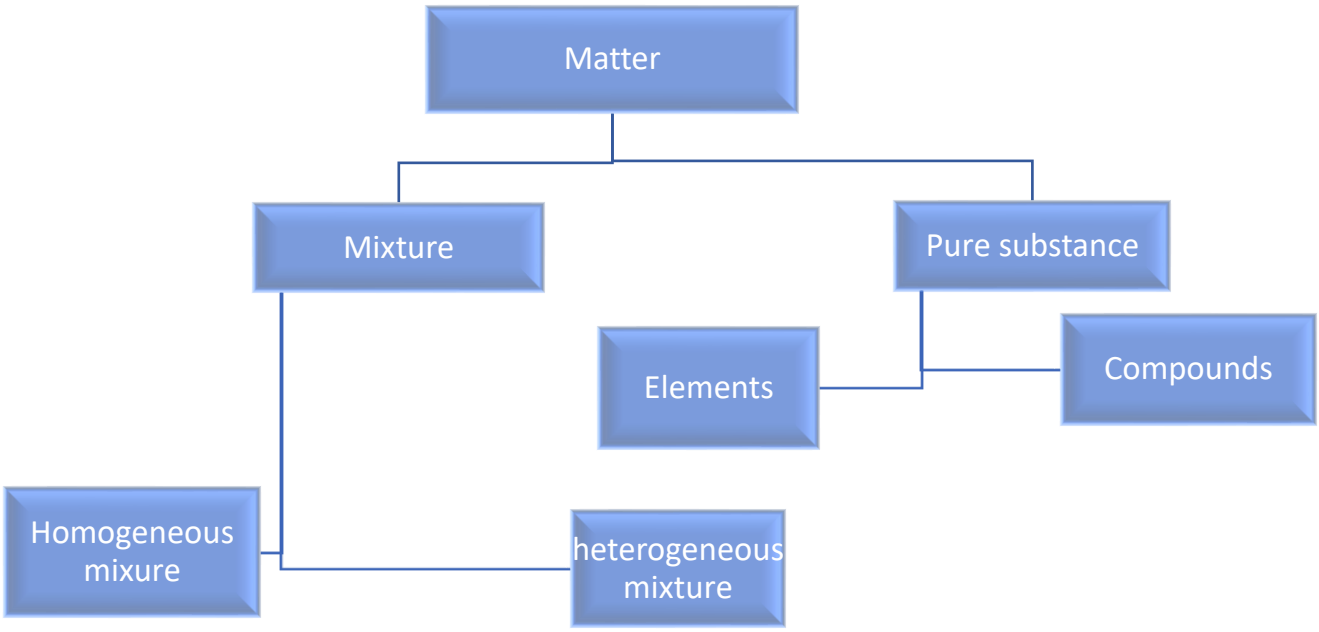
Applying pressure reducing temperature can liquefy gases.

Have you heard of solid carbon dioxide.

It is stored under high pressure. Solid carbon dioxide gets converted directly into gaseous state on decrease of pressure to 1 atmosphere without coming into liquid state. This is the reason that solid carbon dioxide is also known as dry ice.

Thus, we can say that pressure and temperature determine the state of a substance, whether it will be solid, liquid, gases.

Classification of matter



1. **Mixture**: A mixture contains particles of two or more pure substances which may be present in it in any ratio. Hence their composition is variable.

Example: Sugar, Solution of water, air, tea etc.

Homogeneous Mixture and Heterogeneous Mixture

A mixture may be Homogeneous Mixture and Heterogeneous Mixture in Homogeneous Mixture the compounds completely mix with each other

Example: Sugar solution, air, rainwater, steel, cup of coffee etc.

In Heterogeneous mixture the compounds are not completely mix with each other

Example: Mixture of salt and sugar, Stone and wood etc.

2. **Pure substance:** Pure substance have characteristics different from mixtures. Constituent particles of pure substances have fixed composition.
   Example Copper, silver, gold, water, oxygen, chloride, diamond etc.
   Pure substance can further be classified into **elements** and **compounds**
   Particles of an elements consist of only one types of atoms. These particles may exist as atoms or molecules. When two or more atoms of different elements combine together in a definite ratio, the molecule of a compound is obtained.
   Example: Water, ammonia, carbon dioxide, sugar, etc.

Physical and chemical properties of matter

Physical properties	Chemical properties
1.Can be measurable without changing the composition of matter 2.In the measurable the identity of the matter does not change. Example: Mass, density, boiling point etc.	1.The chemical composition changes when measurable the chemical properties. 2. When you measurable the chemical properties, identity of matter change. Example: oxidation state, Coordination etc.