A grouping of materials having similar properties is known as classification of Matter.

All the things that we see around us are made up of matter. Matter is something which has mass and which occupies space.



# Classification of matter

The matter can be broadly classified into groups on the basis of the physical states namely, solid, liquid and gas.

#### **Constitution of Matter**

Matter is made up of small particles. Different states of matter have different arrangement of these particles.

In solids, the particles are very tightly packed with each other and cannot move. Hence, solids have a fixed shape and volume.

In liquids, the particles are less tightly packed and can move a little. Liquids have a fixed volume but not a fixed shape.

In gases, the particles are not held to each other. They move far apart from each other. Gases, therefore, neither have a fixed shape nor a fixed volume.



You can easily understand these properties with the help of this table:

Solid	Liquid	Gas
Not very compressible	Not very compressible	Highly compressible
High denisty	High density	Low density
Definite volume	Definite volume	Fills container competely
Retains its own shape	Assumes shape of container	Assumes shape of container
Motion limited to vibrational movement	Slow diffusion – particles can slip past each other	Rapid diffusion

## Properties of matter

Let us now study some common properties of matter

#### **1.** Transparency

The property of a material to allow light to pass through is called transparency. We can see through a transparent material this property allows you to divide materials into three groups-transparent and translucent and opaque.

Glass is a transparent material as the light can pass through it. Pure water, air, thin sheet of polythene are some other examples of transparent materials.

Some material do not allow light to pass through them. Such materials are called opaque materials.

Wood is an opaque material because light cannot pass through it. Some materials that allow you to see through them partially are called translucent materials. Frosted glass, some plastics, ice and tissue paper are translucent objects.



#### 2. Lusture

Lusture is the ability of a material to shine. Materials that are shiny in appearance are known as lustrous materials. Gold, iron, bronze and silver are examples of lustrous animals. Materials that are dull in appearance or lack shine are known as non-lustrous materials. Paper, rubber, cardboard, wood and wool. Some lustrous materials can lose their shine and appear dull when they are exposed to air or moisture for a longer duration.



#### 3. Texture

Texture of a substance refers to how it feels when touched. Based on the texture, there are two categories of materials

- 1. Rough materials like stones, wood, body scrubber and sand paper.
- 2. Smooth materials, like a piece of cloth cot wool, sponge, soft toys and foam.



### 4. Hardness

Materials can be hard or soft.

Materials that can be easily compressed are known as soft materials. Materials that are difficult to compress are known as hard materials.



### 5. Floating/sinking

Materials which are lighter than water float over it.



### 🚱 6. Diffusion

The property of mixing of particles of two materials on their own is called diffusion. This happens due to the free movement of particles of the material, Gases diffuse very quickly with each other because their particles are in constant motion.

### 7. Dissolution

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When one substance mixes completely with another substance to give a Clear solution, we say it has dissolved. The property by which a substance dissolves in another substance is called dissolution. Water can dissolve a large number of substance. Let us learn about the dissolution of solids, liquids and gases in water.



### 8. Conductivity

The property of a material to allow heat or electricity to pass through it is known as conductivity.

**Conductivity of Heat:** Based on the ability to pass heat through them, materials can be classified as conductors or Insulators of heat. Materials that allow heat to pass through them are called conductors of heat. Examples are metals like copper, aluminum and iron.

Materials that do not allow heat to pass through them are called Insulators of heat. Examples are rubber, wood and plastic.

On the Base of the ability of materials to pass electricity through them, they can be classified as conductors or insulators of electricity. Materials that allow electricity to pass through them are called conductors of electricity. Examples are copper and iron.

Materials that do not allow electricity to pass through them are called insulators of electricity. Examples are wood and plastic. For example, electrical appliances are connected by copper wires to electrical sources as they allow electricity to pass through them. Butthese wires have an outer covering of Insulators like plastic to prevent us from getting an electric shock.



### 9. Magnetic property

A magnet is a substance that can attract pieces of iron and materials made up of iron. Based on the attraction of materials towards a magnet, they can be classified as magnetic or non- magnetic. Materials that get attracted towards a magnet are known as magnetic materials for example, iron. Materials that do not get attracted towards a magnet are known as non-magnetic materials. For example, rubber.