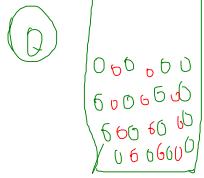
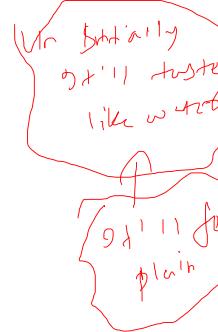


All particles have space b/w them.



Solid	Liquid	Gas
0 0 0 0 0 0 0 0 0	0 0 0 0 0 0 6 6 0 6 0 0 0 0 0	0 0 6 0 6 0 6 0 6 0
(least space) Strongest attraction.	(less space) Moderate attraction	(Maximum space) (weaker attraction)



Ques 1. What is matter? Ans - Matter is anything which occupies space and has mass.

Ques 2. What is matter made up of?

Ans - Matter is made up of tiny particles.

Ques 3. What is mass?

Ans - Mass is the amount of matter in an object.

Ques 4. What is weight?

Ans - Weight is the force of gravity acting on an object.

Ques 5. What is density?

Ans - Density is the mass per unit volume of a substance.

Ques 6. What is volume?

Ans - Volume is the space occupied by a substance.

Ques 7. What is pressure?

Ans - Pressure is the force applied over a unit area.

Ques 8. What is temperature?

Ans - Temperature is a measure of the average kinetic energy of the particles in a substance.

Ques 9. What is viscosity?

Ans - Viscosity is a measure of a substance's resistance to flow.

Ques 10. What is elasticity?

Ans - Elasticity is the ability of a substance to return to its original shape after being deformed.

Ques 11. What is adhesion?

Ans - Adhesion is the attractive force between particles of different substances.

Ques 12. What is cohesion?

Ans - Cohesion is the attractive force between particles of the same substance.

Physical nature of matter

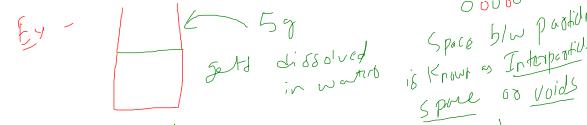
- Is matter continuous?
- Is matter made up of particles?

→ matter is smooth / continuous.

→ How small are particles of matter.

Characteristics of matter particles

→ Particles of matter have space b/w them.



Space b/w particles

is known as Interparticle

Space or voids.

continuously moving

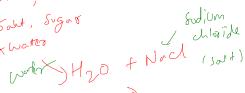
You haven't seen!

Chemical classification

→ Elements - Ex - Gold, Iron, Platinum etc.

→ Compounds - Ex - Salt, Sugar

→ Mixtures - oil & water



→ Particles of matter are continuously moving



- What is matter?
- What is mass?
- What is weight?
- What is density?
- What is volume?
- What is temperature?
- What is light?
- What is sound?
- What is electric current?
- What is magnetism?
- What is heat?

What is matter?
 Matter is defined as anything that occupies space & possess mass to the presence of which can be felt by any one or more of our five sense.

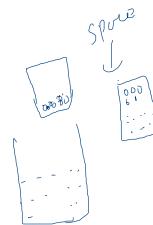
① Bob is tall?
 Right? X

② Metal? X

③ Spiders - 2 more? ✓
 Spiders from a spider? X

④ Do you have any feelings?
 Pain?
 Does it mean a motion? X

Classification of matter



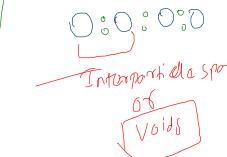
Physical Nature of matter

- ✓ Matter is made up of particles.
- ✓ particles are very small.
- Is sand discrete | continuous / smooth

Particles suspended in gas



Classification of matter



Robert Brown

Took water & added pollen grain

Random movement of particles

Suspended in air or water is known as Brownian motion.

Particles of matter attract each other

✓ break the pencil.
↳ for a swim.

✓ iron nail



would not be
able to break easily

✓ piece of chalk



will break
easily

✓ Strong cohesive
force.

✓ weak cohesive
force.

Are you able to
wave the hands
in water.

↑
Particles in water

have comparatively
less attractive
force.

✓ Solids have strong attractive force.
water than solid
weaker than solid
weakest among all?

✓ Can you wave
↑ hands in air?
air attractive force
is weakest

States of matter
or matter around us exists in three forms:



Properties of Solid State

→ Solids have definite shape, size and volume.

Most of the thing you see around
is solid.

Matter → Particles
Matter → Solid (one of the state
of matter)

✓ Force of attraction is more.

✓ Solid's particle vibrate in their fixed pos.

✓ Interparticle space b/w solids are almost
negligible.

→ Due to strong interparticle forces of attraction
Small interparticle distances, solids have a fixed
shape like the table & pen.

→ Solid Possess rigidity

Solids have the tendency to
maintain shape even when some outside
force is applied.

(Explanation) rubber band - When force is applied → shape is changed
When force is released, regains back to
its original state.

Elastic Solids

Clay - When force is applied → changes its shape
when force is released → it is not regains
back to its original shape.

Plastic Solids

→ Solids have high density

Dense → particles are very close to
each other.

Density is how close particles of a substance.

✓ Force of attraction b/w particles are strong.

→ Can Solids spread?
Force of attraction b/w particles are
so strong



→ Solids are not compressible
↑ Small interparticle distances



→ Solids do not possess the property of diffusion

Diffusion → O.D Ex - water, ink

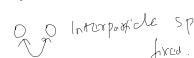
- → (Intermixing of particles of different types
of matter on their own called is diffusion)

Properties of liquid state

✓ Solid, liquid, gas matter - particles
whatever the property of these are just because of particles.

→ Liquids don't have a fixed shape but have a fixed vol.

→ Cohesive strength b/w particles & liquid weakest



* Liquids do not have a fixed shape but have a fixed volume.

* Liquids are not rigid but have the property to flow.
what do we call liquid? Fluid 2.



Fluidity - Ability to flow:

Viscosity
Thickness

* Liquids have moderate density

* Liquids are compressible ← interparticle spaces b/w particles of liquids are random.

* Liquids possess the property of diffusion

Solid into liquids :- potassium permanganate into water.

Liquid into liquids:- ink & water.



Properties of gaseous State

✓ Gases Neither have a definite shape nor a fixed volume.

① Interparticle space in gases are more & also not fixed.

✓ High fluidity & least rigidity.
↳ don't have shape

→ Gases are highly compressible

⇒ Interparticle spaces are large.
Ex - LPG cylinders

→ Gas exert pressure

pressure of the gas
force per unit area exerted by the
particles of the gas on the walls of a
container.

3 Scales for measuring the temp

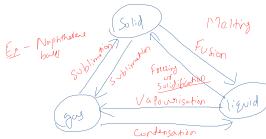
- Celsius
- Fahrenheit scale
- Kelvin scale

Now C & F scales are related

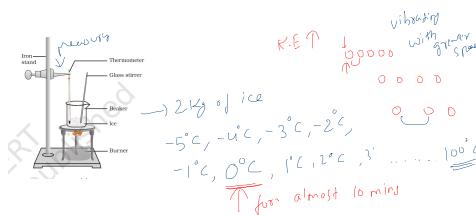
$$F = \frac{9}{5}(^{\circ}C) + 32$$

SI unit of temperature — Kelvin

Interconversion of states of matter



Difference in the three states of matter is due
to the difference in the space b/w the
constituent particles.



latent heat

Solid $\xrightarrow{\text{atm}}$ liquid = Melting Point
or
fusion

latent heat of fusion —

H.E required to convert 1 kg of
Solid to liquid at atm at its melting
point.

3.347×10^5 Joules of heat is
required to change 1 kg of ice at 170
Melting Point (0°C) into water at
the same temp 273 K

0°C both ice & water exist together.

↑
have more energy

- 8 Which is more effective in cooling a substance than water at 0°C ?
 Ice at 0°C is more effective in cooling.

Change of state from liquid to solid - Freezing.

$$\text{Latent heat} = 3.34 \times 10^5 \text{ J/kg}$$

- ✓ 1 kg of liquid → solid. absorbs energy converted to liquid.
- ✓ liquid → solid. $3.34 \times 10^5 \text{ J/kg}$ given off.

Ice melting point - 0°C
 Water freezing point - 0°C

(Ice cream freezes fast) / (Water)

✓ Impurities lower the freezing point of liquids

✓ Pressure decreases the freezing point of ice

Change of state from liquid to gas - Boiling

Latent heat → latent heat of vaporization.



Amount of heat energy required to change 1 kg liquid into vapour at atm at its boiling is called latent heat of vaporization.

$$\rightarrow (\text{latent heat of vaporization of water}) = 22.6 \times 10^5 \text{ J/kg}$$

$$\rightarrow 0^{\circ}\text{C} \rightarrow \text{ice & water} \quad 100^{\circ}\text{C} \rightarrow \text{water & steam}$$

- or which is more effective for heating purpose?
 Steam is more effective than boiling water
 for heating purpose.

Condensation

Change of gaseous State to liquid State.



100°C Water & Steam

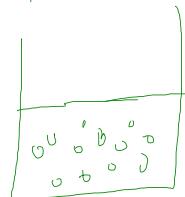
Latent heat

Sublimation

Solid → liquid → gaseous
 heat Solid ⇌ vapours.

Evaporation

- ✓ Phenomenon of change of a liquid into vapours at any temperature below its boiling point is called Evaporation.



a How does Evaporation Causes cooling?

Factors affecting Evaporation of liquid

- Surface area
- Increase in Temp.
- Decrease in humidity. → (Sweat)
- Speed of wind.