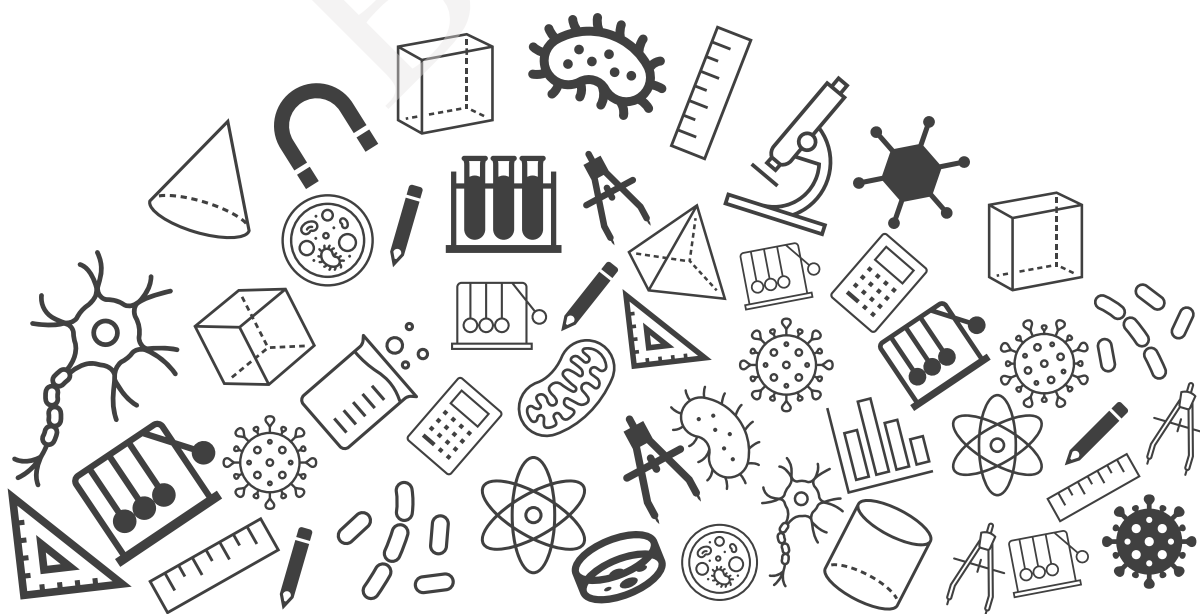




Grade 09

Science Chapter Notes

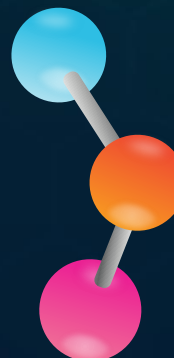


BYJU'S Classes

Chapter Notes

Matter in Our Surroundings

GRADE 09



Topics to Be Covered

2. Characteristics of Particles of Matter

- 2.1 Have interparticle spaces
- 2.2 Are in continuous motion
- 2.3 Have interparticle force of attraction

4. Interconversion of state of matter

- 4.1 Effect of change in temperature
- 4.2 Effect of change in pressure

1. Physical Nature of Matter

- 1.1 Introduction to matter
- 1.2 Composition of Matter

3. States of Matter

- 3.1 Solid state
- 3.2 Liquid state
- 3.3 Gaseous state

5. Evaporation

- 5.1 Introduction to evaporation
- 5.2 Factors affecting evaporation
- 5.3 Evaporation causes cooling

Matter in our Surroundings

Characteristics of particle of Matter

- Have interparticle space
- Are in Continuous motion
- Have interparticle force of attraction

Interconversion

Effect of Temperature

Effect of Pressure

Evaporation

States of Matter

Solid State

Liquid State

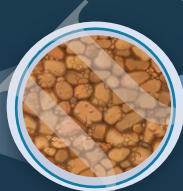
Gaseous State

1. Physical Nature of Matter

1.1 Introduction to matter

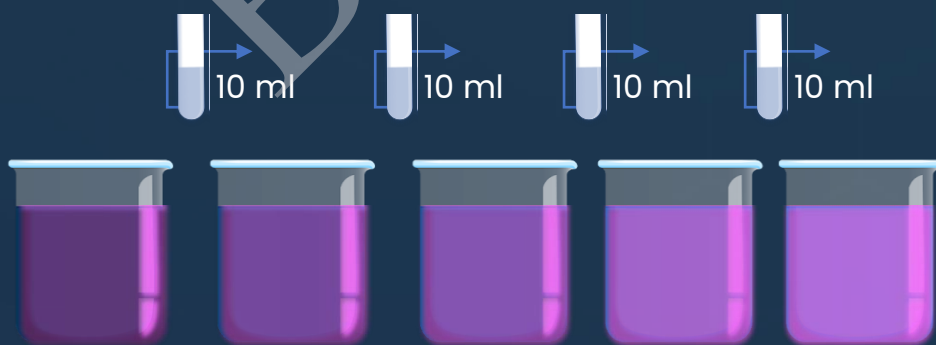
Matter is defined as any substance that has mass and volume; can be perceived by senses.

1.2 Composition of Matter



Tiny particles

Experimental study:

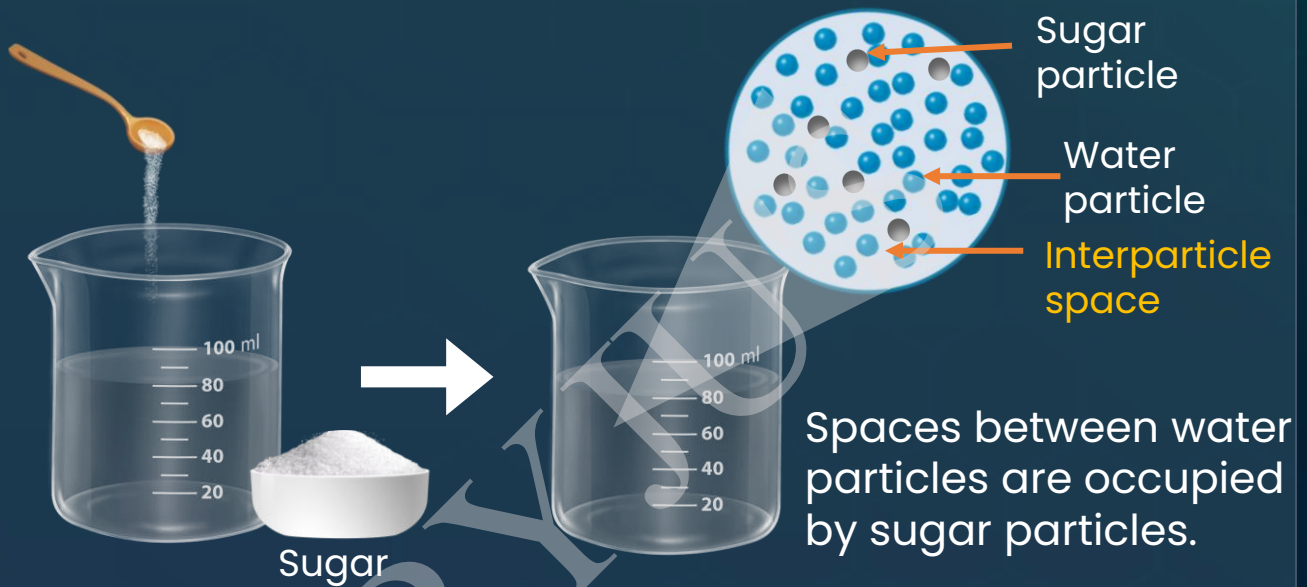


The solution of potassium permanganate is kept on diluting with water, colour becomes lighter. One crystal of potassium permanganate has millions of tiny particles which keep on dividing themselves into smaller and smaller particles. It concludes that matter is made up of **tiny particles**.

2. Characteristics of Matter of Particles

2.1 Have interparticle spaces

Spaces between two adjacent particles in a matter is known as interparticle spaces.



2.2 Are in continuous motion

Particles of matter are in continuous motion as they have kinetic energy.

As the **temperature rises**, kinetic energy of particles also increases which result in an **increase** in the **motion of particles**.

2. Characteristics of Matter of Particles

2.3 Have interparticle force of attraction

Particles of matter have force acting between them which keep particles together. This force is known as interparticle force of attraction.



Diffusion

The intermixing of particles of two different types of matter on their own is known as diffusion.



As the **temperature increases**, the rate of **diffusion becomes faster** due to an increase in the kinetic energy of particles.

3. States of Matter

3.1 Solid state



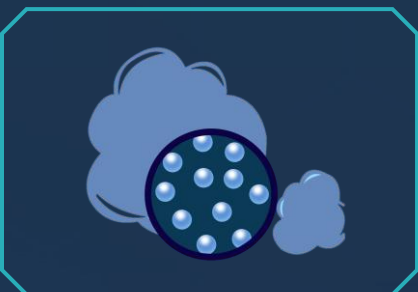
- Definite shape
- Definite volume
- Mostly incompressible
- Rigid

3.2 Liquid state



- Indefinite shape
- Definite volume
- Mostly incompressible
- Have fluidity

3.3 Gaseous state

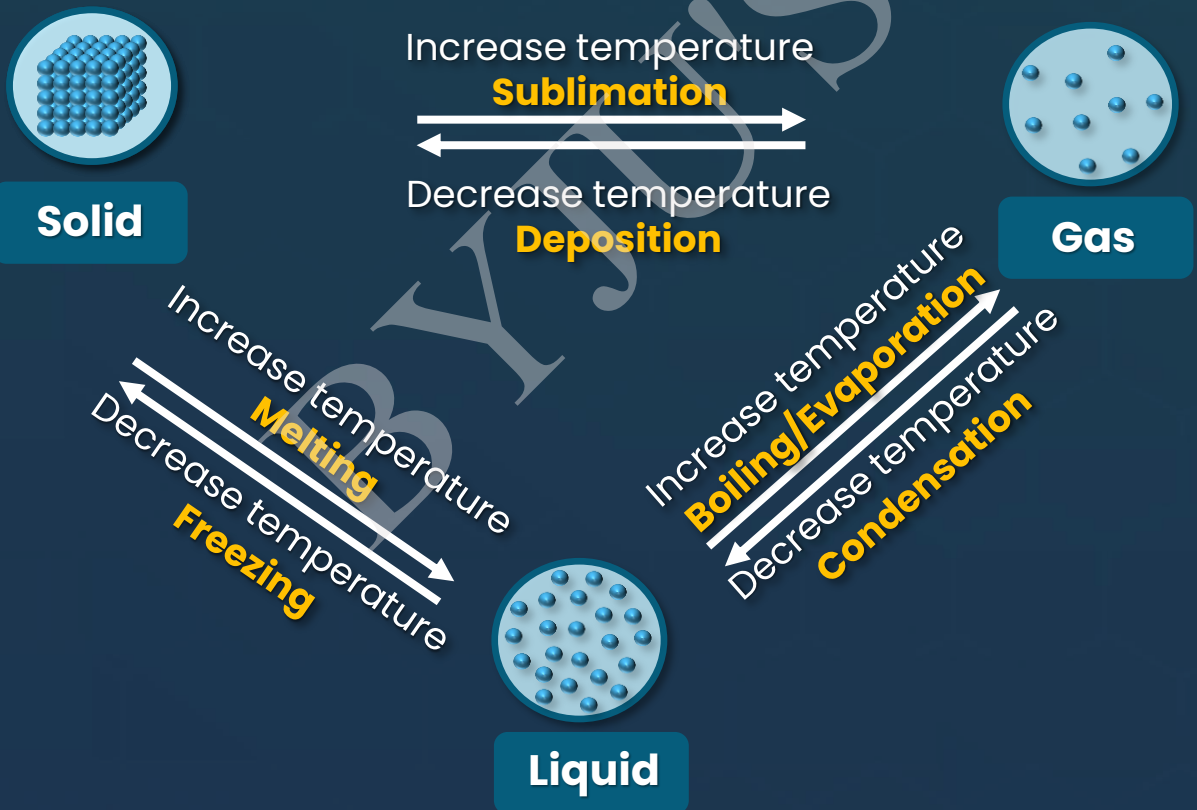


- Indefinite shape
- Indefinite volume
- Easily compressible
- Have fluidity

4. Interconversion of States of Matter

4.1 Effect of change in temperature

Interconversion of states of matter can be done by either decreasing or increasing the temperature.

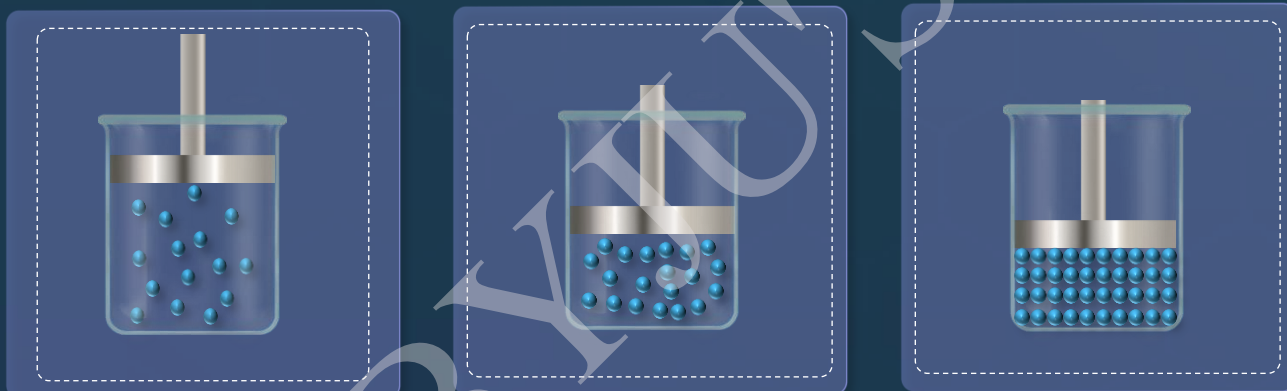
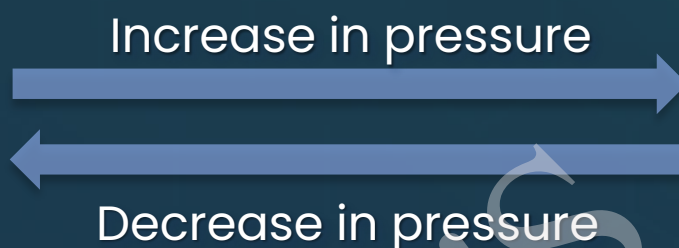


Increase in temperature, **increases** the interparticle **space** and **kinetic energy** of particle.

4. Interconversion of States of Matter

4.2 Effect of change in pressure

Interconversion of states of matter can also be done by either decreasing or increasing the pressure.



Increase in pressure, **decreases** the interparticle **space**.

5. Evaporation

5.1 Introduction to evaporation

The process of converting a liquid into a gas at any temperature below its boiling point is called evaporation.

It is a **surface phenomenon**.



Evaporation is a **surface phenomena** while boiling is a **bulk phenomena**.

5. Evaporation

5.2 Factors affecting evaporation

Temperature



An increase in temperature increases the rate of evaporation because more liquid particles will gain sufficient kinetic energy to break free from the force of attraction of the particles and evaporate.

Humidity



Increased humidity in the atmosphere would decrease the rate of evaporation as there would be a lot of water content already present in the air making the air around saturated.

5. Evaporation

5.2 Factors affecting evaporation

Wind speed



If there is an increase in wind speed, the particles of water vapour will move away from the air, which will increase the rate of evaporation.

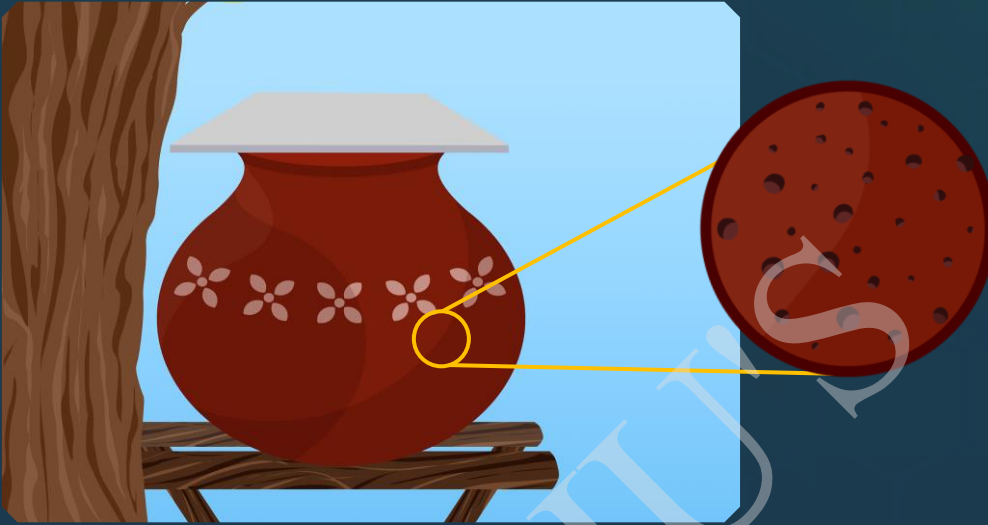
Surface area



When we increase the surface area, i.e. if we spread the clothes to let them dry, the evaporation is faster. This is because simply there is a greater surface area for the liquid particles to escape from.

5. Evaporation

5.3 Evaporation causes cooling



Cooled water in an earthen pot

Evaporation causes cooling because the particles of liquid absorb energy from the surroundings to regain the energy lost during evaporation. This absorption of energy from the surroundings makes the surroundings cold.