5. Substances in the Surroundings - Their States and Properties

- The different states of matter are Solid, Liquid and Gaseous.
- Characteristics of different states of matter are:
    - Solids have a definite shape while liquid and gases do not.
    - Solid and liquid have definite volume while gases do not.
    - Solids are rigid while gases and liquids are fluid.
    - Solids do not diffuse while liquids and gases do in one another.

- The states of matter (solid, liquid and gas) are interchangeable.
- Change from the solid state to the liquid state is called **melting**.
- Change from the liquid state to the solid state is called **freezing**.
- Change from the liquid state to the gaseous state is called **vapourisation**.
- Change from the gaseous state to the liquid state is called **condensation**.
- The process in which a substance changes directly from the solid state to the gaseous state without entering into the liquid state is called **Sublimation.**
- The process opposite to sublimation. In this, a substance changes directly from the gaseous state to the solid state is called **Deposition**.
- Temperature tells us about the **hotness** or **coldness** of an object.
- The temperature of an object is measured using a thermometer.

- Different materials have different properties and they are grouped on the basis of differences and similarities in their properties.
- Some materials are **lustrous** or shiny in appearance (for example, metals) and some are not (for example, chalk, wood, paper).
- Some materials are **hard** (for example, metals, wood) and some are **soft** (for example, candle and chalk).

- **Soluble (in water):** Substances that completely dissolve in water are known as soluble substances. Examples: salt, sugar, vinegar, lemon juice etc.
- **Insoluble (in water):** Substances that do not mix with water even after we stir it for a long time are known as insoluble substances. Examples: sand, chalk powder, saw dust, mustard oil, coconut oil, kerosene etc.
- The substances which are insoluble in water, either **float** (for example, dry leaves, wooden cork) or **sink** (for example, stone, key) in water.
- The substances that can easily flow through a surface have high **fluidity** (for example water) while some are thick and have less smooth flow.

- Substances or materials through which things can be seen are called **transparent** substances. Example: glass, water, air
- Substances or materials through which things can be seen but not clearly are called **translucent** substances. Example: oiled paper

- Substances or materials through which things cannot be seen are called **opaque** substances. Example: wood, metals.

Metals

- **Physical properties**
- Shining surface (in pure state) [called metallic lustre]
- Generally hard [varies from metal to metal]
- Malleable [i.e. can be made thin sheets by beating]
- Ductile [i.e. can be drawn into thin wires]
    - [Gold → Highly ductile]
- Good conductors of heat
- High melting point
- Conduct electricity
- Produce sound [some metals; these are called sonorous]

Non-metals

- Non-metals are found in all the three states i.e. solid, liquid and gas, at room temperature.
- Iodine (non-metal) has lustre
- Carbon has allotropes (exists in different forms)
    - Diamond is hard
    - Graphite (Conducts electricity)

Metals	Non-metals
1. Generally, these are hard and lustrous.	These are soft and have no lustre.
2. These are malleable and ductile (Malleable: can be beaten into sheets; Ductile: can be drawn into wires).	These are non-malleable and non-ductile.
3. These are sonorous (produce ringing sound when struck).	These are not sonorous.
4. These are good conductors of heat and electricity.	These are poor conductors of heat and electricity.