

Chapter 3: Elements, Compounds, and Mixtures

1. Revision of Elements, Compounds, and Mixtures

- **Elements, compounds, and mixtures** are the basic classifications of matter based on their composition.
- Understanding their differences helps in identifying and separating substances in nature.

2. Explanation of Elements, Compounds, and Mixtures

Category	Definition	Examples
Element	A pure substance made of only one type of atom. Cannot be broken down into simpler substances.	Oxygen (O ₂), Gold (Au), Iron (Fe)
Compound	A substance formed by the chemical combination of two or more elements in a fixed ratio. Properties are different from its constituent elements.	Water (H ₂ O), Carbon dioxide (CO ₂), Salt (NaCl)
Mixture	A combination of two or more substances (elements or compounds) physically mixed, but not chemically combined.	Air, Sugar in water, Sand and iron filings

3. Separation of Components of a Mixture

Since mixtures are **physically combined**, they can be separated using different techniques based on the properties of their components.

Separation Method	Principle	Example
Filtration	Separates insoluble solids from liquids.	Sand from water
Evaporation	Removes a liquid, leaving behind dissolved solids.	Salt from seawater
Distillation	Separates liquids based on different boiling points.	Alcohol from water
Magnetic Separation	Uses magnet to separate magnetic substances.	Iron from a mixture of iron and sand
Chromatography	Separates components of a mixture based on differences in solubility.	Separation of colors in ink
Sedimentation & Decantation	Heavier particles settle at the bottom, and liquid is poured off.	Muddy water separation