⚙️ Topic: Properties of Materials – Metals (I)

Sub-topics:

1. Identification of Metals by Physical Properties
2. Types of Metals
3. Meaning and Examples of Alloys

🎯 Lesson Objectives

By the end of this lesson, students should be able to:

- Identify metals based on physical properties.
- Classify metals into ferrous and non-ferrous types.
- Define alloys and give examples.

🔍 1. Identification of Metals by Physical Properties

Metals can be identified using the following physical properties:

Property	Description
Lustre	Metals are shiny when polished.
Conductivity	Metals conduct heat and electricity well.
Malleability	Metals can be hammered into sheets.
Ductility	Metals can be drawn into wires.
Hardness	Metals are generally hard and strong.
Sonority	Metals produce a ringing sound when struck.
Magnetism	Some metals like iron are magnetic.

📌 **Examples**:

- Iron is magnetic and hard.
- Copper is reddish and a good conductor.

- Aluminum is light and does not rust.

🧱 2. Types of Metals

a. Ferrous Metals

These are metals that **contain iron**.
They are usually **strong, hard, and magnetic**, but they **rust easily**.

Examples:

Iron

Steel

Cast Iron

b. Non-Ferrous Metals

These **do not contain iron**. They are **lightweight**, **resist corrosion**, and **non-magnetic**.

Examples:

Copper

Aluminum

Zinc

Lead

Brass (an alloy)

Bronze (an alloy)

🧪 3. Alloys

✅ Definition:

An **alloy** is a mixture of two or more metals (or a metal and a non-metal) to improve strength, corrosion resistance, or other properties.

📋 Examples of Alloys:

Alloy	Composition	Uses
Bronze	Copper + Tin	Medals, sculptures
Brass	Copper + Zinc	Musical instruments, door handles
Steel	Iron + Carbon	Construction, machinery
Stainless Steel	Iron + Chromium + Nickel	Cutlery, kitchen equipment