Lesson Plan: Metals and Non-metals (CBSE Class X 2026-27)

Teacher:

Class: X

Subject: Science (Subject Code - 086)

Unit I: Chemical Substances - Nature and Behaviour (Unit Weightage: 25 Marks)

Chapter: 3 – Metals and Non-metals

Estimated Number of Periods: 12

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1. Gist of the Lesson & Curricular Goals

- **Core Syllabus:** Properties of metals and non-metals; Reactivity series; Formation and properties of ionic compounds; Basic metallurgical processes; Corrosion and its prevention.

- **Educational Aim:** To develop capacities for scientific inquiry by observing material interactions, and to foster real-world connections by exploring how metals are extracted, utilized, and protected in daily life according to NCF-SE 2023 and NEP 2020 guidelines.

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2. Teaching-Learning Plan & Pedagogy

Key Concepts	**Competencies (C) & Learning Outcomes**	**Teaching-Learning Activities (Pedagogy)**	**Assessment Strategies**
Physical & Chemical Properties	**C-1.2:** Investigates the nature and properties of chemical substances. • *Outcome:* Students will identify metals/non-metals based on physical properties and predict their	• **Activity/Demonstration:** Show physical samples (Iron, Copper, Sulphur, Iodine) to discuss malleability, ductility, and luster. • **Discussion:** Burn magnesium ribbon to	• **[Demonstrate Knowledge - VSA]:** *State* two exceptions to the physical properties of metals (e.g., liquid mercury). • **[Application - SA]:** *Explain* the amphoteric nature of aluminum oxide with equations.

	chemical reactions with air and water.	show oxide formation (basic) versus burning sulphur (acidic oxide).	
Reactivity Series & Displacement	**C-1.3:** Describes and represents chemical interactions (metal and non-metal). **C-8.2:** Accurately uses scientific instruments and draws inferences based on data.	• **Mandatory Practical (Exp 3):** Observe the action of Zn, Fe, Cu, and Al metals on salt solutions: $ZnSO_4$, $FeSO_4$, $CuSO_4$, $Al_2(SO_4)_3$. • **Data Mapping:** Use the results to construct the reactivity series.	• **[Formulate & Analyze - Case-Based]:** *Interpret* experimental data to arrange given metals in decreasing order of reactivity. • **[Application - Objective]:** *Predict* if a reaction will occur when copper is added to iron sulphate.
Formation & Properties of Ionic Compounds	**C-1.1:** Explains how compounds are formed based on atomic structure and valency. • *Outcome:* Students will map electron transfer and deduce the properties of ionic compounds.	• **Board Work:** Draw electron dot structures showing the transfer of electrons from Sodium to Chlorine ($Na^+ + Cl^- \rightarrow NaCl$) and Magnesium to Chlorine ($MgCl_2$). • **Discussion:** Link the strong electrostatic forces to high melting/boiling points and electrical conductivity in a molten state.	• **[Application - SA]:** *Illustrate* the formation of magnesium chloride using electron dot structures. • **[Analyze & Evaluate - Assertion-Reasoning]: ***Examine* why solid sodium chloride does not conduct electricity but molten sodium chloride does.

Basic Metallurgy & Corrosion	**C-1.3:** Represents chemical changes using chemical equations. • *Outcome:* Students will outline the steps of metal extraction from ores and devise methods to prevent corrosion.	• **Flowcharting:** Map the extraction process for metals of low, medium, and high reactivity (Roasting vs. Calcination). • **Real-World Connection:** Discuss the rusting of iron, the green coating on copper, and prevention techniques like galvanization and alloying.	• **[Demonstrate Knowledge - VSA]:** *Define* roasting and calcination. • **[Application - LA]:** *Explain* the process of electrolytic refining of copper with a labeled diagram.

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3. Assessment Structure & Weightage

Assessments are strictly modeled on the CBSE 2026-27 Theory Question Paper Design (80 marks):

- **Demonstrate Knowledge and Understanding (50%):** Assessed via questions asking students to *state, name, list, identify, define, suggest, describe, outline, and summarize* (e.g., listing properties of ionic compounds, defining ores).
- **Application of Knowledge/Concepts (30%):** Assessed via questions asking students to *calculate, illustrate, show, adapt, explain, and distinguish* (e.g., illustrating electron dot structures, explaining galvanization).
- **Formulate, Analyze, Evaluate and Create (20%):** Assessed via questions asking students to *interpret, analyze, compare, contrast, examine, evaluate, discuss, and construct* (e.g., interpreting reactivity series data, comparing roasting and calcination).

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4. Digital Integration & Portfolio Enrichment (Internal Assessment - 20 Marks)

- **Subject Enrichment (Practical Work - 5 Marks):** Evaluated strictly on the execution of

Experiment 3, emphasizing accurate observation, handling of metal samples and salt solutions, and the logical deduction of the reactivity series in the lab record .

- **Digital Integration Strategy:** To reinforce concepts ahead of Periodic Assessments (5+5 Marks), utilize 3D digital simulations of ionic crystal lattices (e.g., NaCl structure) from platforms like DIKSHA to help students visualize the strong electrostatic forces holding the ions together, explaining their physical state and high melting points.
- **Portfolio Task (5 Marks):** Students will *examine* objects in their household to identify two instances of corrosion (e.g., a rusted iron nail, tarnished silver jewelry, or oxidized copper wire). They will prepare a brief visual report documenting the chemical equations for these specific types of corrosion and propose practical methods (like painting, greasing, or galvanization) to prevent them, securely adding this to their academic portfolio.