Lesson Plan: Acids, Bases and Salts (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: 2 – Acids, Bases and Salts

Estimated Number of Periods: 12

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1. Gist of the Lesson & Curricular Goals

- **Core Syllabus:** Definitions of acids and bases (furnishing of H^+ and OH^- ions), identification using indicators, chemical properties, neutralization, concept of pH scale, importance of pH in everyday life, and the preparation and uses of Sodium Hydroxide, Bleaching Powder, Baking soda, Washing soda, and Plaster of Paris.
- **Educational Aim:** To foster evidence-based thinking and observational skills by having students physically test and classify common household and laboratory substances, connecting abstract chemical concepts to real-world applications.

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2. Teaching-Learning Plan & Pedagogy

Key Concepts	Competencies (C) & Learning Outcomes	Teaching-Learning Activities (Pedagogy)	Assessment Strategies
Definitions & Indicators	**C-1.2:** Investigates the nature and properties of chemical substances. • *Outcome:* Students will classify substances based on H^+/OH^- ions and identify them using indicators.	• **Mandatory Practical (Exp 1B - Part 1):** Study the properties of HCl and NaOH on the basis of their reaction with Litmus solution (Blue/Red). • **Discussion:** Connect synthetic	• **[Demonstrate Knowledge - VSA]:** *Define* an acid and a base in terms of ion formation in water. • **[Application - Objective]:** *Predict* the color change of methyl orange in an acidic medium.

		indicators (phenolphthalein, methyl orange) with natural indicators (turmeric).	
Chemical Properties of Acids & Bases	**C-1.3:** Describes and represents chemical interactions using equations. **C-8.2:** Accurately uses scientific instruments to collect data.	• **Mandatory Practical (Exp 1B - Parts 2 & 3):** React HCl and NaOH with Zinc metal (testing for H_2 gas with a pop sound) and solid Sodium Carbonate (testing for CO_2 with lime water). • **Equation Mapping:** $Zn + 2HCl \rightarrow ZnCl_2 + H_2$	• **[Application - SA]:** *Illustrate* the reaction between a metal carbonate and an acid with a balanced equation. • **[Formulate & Analyze - Assertion-Reasoning]: :** *Evaluate* why curd and sour substances are not kept in brass/copper vessels.
Neutralization & The pH Scale	**C-1.2:** Investigates properties of solutions. • *Outcome:* Students will correlate hydrogen ion concentration with pH values and explain its everyday importance.	• **Mandatory Practical (Exp 1A):** Find the pH of Dilute HCl, Dilute NaOH, Dilute Ethanoic Acid, Lemon juice, Water, and Dilute Hydrogen Carbonate using universal indicator paper. • **Case Study:** Discuss tooth decay (pH below 5.5) and the use of antacids (mild bases) for indigestion.	• **[Demonstrate Knowledge - VSA]:** *State* the pH range of the human body. • **[Analyze & Evaluate - Case-Based]:** *Interpret* a given table of pH values to identify the strongest acid and strongest base.

Preparation & Uses of Important Salts	**C-1.3:** Describes chemical changes using symbols. • *Outcome:* Students will detail the chemical preparation and real-world uses of common salts.	• **Flowcharting:** Map the Chlor-alkali process to show the formation of NaOH, Cl_2, and H_2. • **Equation Practice:** Write the heating effect on Baking Soda to form Washing Soda ($2NaHCO_3 \rightarrow Na_2CO_3 + H_2O + CO_2$) and the hydration of Plaster of Paris to form Gypsum.	• **[Demonstrate Knowledge - SA]:** *List* two uses each of Bleaching Powder and Washing Soda. • **[Application - LA]:** *Explain* the preparation of Plaster of Paris and write its chemical formula ($CaSO_4 \cdot ½H_2O$).

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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., stating uses of salts, defining pH).
- **Application of Knowledge/Concepts (30%):** Assessed via questions asking students to *calculate, illustrate, show, adapt, explain, and distinguish* (e.g., writing balanced equations for neutralization).
- **Formulate, Analyze, Evaluate and Create (20%):** Assessed via questions asking students to *interpret, analyze, compare, contrast, examine, evaluate, discuss, and construct* (e.g., interpreting the results of gas tests during experiments).

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

- **Subject Enrichment (Practical Work - 5 Marks):** Evaluated strictly on the safe and accurate execution of Experiment 1A (pH testing) and Experiment 1B (chemical properties), focusing on observational skills, safety with acids, and maintenance of the practical lab record.
- **Digital Integration Strategy:** To reinforce student retention ahead of Periodic Assessments (5+5 Marks), utilize digital pH scale simulators (e.g., PhET Interactive

Simulations via the DIKSHA portal) to allow students to digitally mix acids and bases and observe microscopic ion concentrations and macroscopic pH changes.

- **Portfolio Task (5 Marks):** Students will *investigate* natural indicators found in their own kitchens (e.g., turmeric, red cabbage, beetroot extract). They will prepare a brief write-up documenting the color changes of these natural indicators when tested with household acids (lemon/vinegar) and bases (baking soda/soap), securely adding the report and photographic evidence to their academic portfolio.