

Lesson Plan: Chemical Reactions and Equations (CBSE Class X 2026-27)

Teacher: Tushar Sir

Class: X

Subject: Science (Subject Code - 086)

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

Chapter: 1 – Chemical Reactions and Equations

Estimated Number of Periods: 10

1. Gist of the Lesson & Curricular Goals

- **Core Syllabus:** Chemical reactions, chemical equations, balanced chemical equations, and types of chemical reactions (combination, decomposition, displacement, double displacement, precipitation, endothermic, exothermic, oxidation, and reduction).
- **Educational Aim:** To nurture responsible, informed, and critically thinking citizens by developing capacities for scientific inquiry and evidence-based thinking.

2. Teaching-Learning Plan & Pedagogy

Key Concepts	Competencies (C) & Learning Outcomes	Teaching-Learning Activities (Pedagogy)	Assessment Strategies
Chemical Equations & Balancing	C-1.3: Describes and represents chemical interactions and changes using symbols and chemical equations. • <i>Outcome:</i> Students	• Board Work: Teach the mathematical "Hit and Trial" method for balancing equations. • Discussion: Connect the necessity of balancing equations to the Law of	• [Demonstrate Knowledge - VSA]: State the law of conservation of mass . • [Application - SA]: Calculate the coefficients to balance the given skeleton

	will identify reactants and products and write balanced skeleton equations.	Conservation of Mass.	equation.
Combination & Exothermic Reactions	<p>C-1.3: Describes chemical interactions .</p> <p>C-8.2: Accurately uses scientific instruments to collect data.</p>	<p>• Mandatory Practical (Exp 2a): Observe the action of water on quicklime. Students feel the beaker to experience the exothermic nature.</p> <p>• Equation Mapping: $\text{CaO} + \text{H}_2\text{O} \rightarrow \text{Ca}(\text{OH})_2 + \text{Heat}$</p>	<p>• [Demonstrate Knowledge - Objective]: <i>Identify</i> the single product formed in the reaction .</p> <p>• [Application - Assertion-Reasoning] : <i>Explain</i> the release of heat during the combination of calcium oxide and water.</p>
Decomposition & Endothermic Reactions	<p>C-1.3: Represents chemical changes using symbols.</p> <p>• <i>Outcome:</i> Students will differentiate between thermal, electrolytic, and photolytic decomposition.</p>	<p>• Mandatory Practical (Exp 2b): Action of heat on ferrous sulphate crystals. Observe the color change and note the emission of gas.</p> <p>• Equation: $2\text{FeSO}_4 \rightarrow \text{Fe}_2\text{O}_3 + \text{SO}_2 + \text{SO}_3$</p>	<p>• [Analyze & Evaluate - SA]: <i>Contrast</i> decomposition reactions with combination reactions .</p> <p>• [Application - LA]: <i>Illustrate</i> the thermal decomposition of lead nitrate with a balanced equation.</p>
Displacement, Double Displacement & Reactivity	C-1.3: Describes and represents chemical interactions .	<p>• Mandatory Practical (Exp 2c & 2d): Iron nails in copper sulphate; sodium sulphate and</p>	<p>• [Formulate & Analyze - Case-Based]: <i>Interpret</i> the experimental data to</p>

	<p>C-8.2: Draws inferences based on data.</p>	<p>barium chloride reaction .</p> <p>• Mandatory Practical (Exp 3): Observe the action of Zn, Fe, Cu, and Al on salt solutions ($ZnSO_4$, $FeSO_4$, $CuSO_4$, $Al_2(SO_4)_3$) to deduce the reactivity series .</p>	<p>arrange Zn, Fe, Cu, and Al in decreasing order of reactivity .</p> <p>• [Demonstrate Knowledge - VSA]: Define a precipitation reaction.</p>
<p>Oxidation and Reduction</p>	<p>C-1.3: Describes chemical interactions.</p> <p>• <i>Outcome:</i> Students will identify oxidized/reduced substances and agents.</p>	<p>• Demonstration: Heating copper powder in a china dish to show surface oxidation (black CuO), then passing H_2 gas over it to reverse the reaction (Reduction).</p> <p>• Concept Mapping: Draw flowcharts indicating the gain/loss of oxygen and hydrogen.</p>	<p>• [Demonstrate Knowledge - MCQs]: Name the substance oxidized in a given reaction .</p> <p>• [Application - SA]: Distinguish between an oxidizing agent and a reducing agent.</p>

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*.
- **Application of Knowledge/Concepts (30%):** Assessed via questions asking students to

calculate, illustrate, show, adapt, explain, and distinguish.

- **Formulate, Analyze, Evaluate and Create (20%):** Assessed via questions asking students to *interpret, analyze, compare, contrast, examine, evaluate, discuss, and construct.*

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

- **Subject Enrichment (Practical Work - 5 Marks):** Evaluated strictly on the execution of Experiment 2 (a, b, c, d) and Experiment 3, emphasizing accurate use of scientific instruments, chemical handling, and documentation of observations .
- **Digital Integration Strategy:** To reinforce student retention ahead of Periodic Assessments (5+5 Marks), utilize interactive digital modules such as 3D simulations of chemical bonds or short, targeted summary videos (e.g., from the DIKSHA portal) to visualize displacement and decomposition reactions.
- **Portfolio Task (5 Marks):** Students will *examine* a real-life chemical reaction happening at home (e.g., rusting of an iron gate, milk turning to curd) and prepare a brief write-up including the balanced chemical equation, securely adding it to their academic portfolio.