Lesson Plan: Electricity (CBSE Class X 2026-27)

Teacher: Class: X

Subject: Science (Subject Code - 086)

Unit IV: Effects of Current (Unit Weightage: 13 Marks)

Chapter: 11 – Electricity

Estimated Number of Periods: 14

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1. Gist of the Lesson & Curricular Goals

- **Core Syllabus:** Electric current, potential difference, and Ohm's law. Resistance, Resistivity, and factors on which resistance depends. Series and parallel combinations of resistors and their applications. Heating effect of electric current. Electric power, and the interrelation between P, V, I, and R .

- **Educational Aim:** To develop the capacity to manipulate and analyze circuit characteristics and mathematize their relationships, empowering students to apply scientific principles to everyday usages like home wiring and energy consumption.

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2. Teaching-Learning Plan & Pedagogy

Key Concepts	**Competencies (C) & Learning Outcomes**	**Teaching-Learning Activities (Pedagogy)**	**Assessment Strategies**
Electric Current, Potential Difference & Ohm's Law	**C-2.4:** Manipulates and analyses characteristics of the circuit (current, voltage) and mathematises their relationship. • *Outcome:* Students	• **Mandatory Practical (Exp 4):** Studying the dependence of potential difference (V) across a resistor on the current (I) passing through it and determine its resistance. Students will plot a V-I graph .	• **[Demonstrate Knowledge - VSA]:** *State* Ohm's law. • **[Formulate & Analyze - SA]:** *Interpret* a given V-I graph to determine the resistance of a conductor.

	will define current and voltage, and graphically verify Ohm's Law.		
Resistance & Resistivity	**C-2.4:** Analyses different characteristics of the circuit. • *Outcome:* Students will identify the factors affecting the resistance of a conductor (length, area, material).	• **Demonstration/Board Work:** Mathematize the relationship R = ρ(L/A). • **Discussion:** Discuss why copper and aluminum are used for electrical transmission, whereas alloys like nichrome are used in heating elements.	• **[Demonstrate Knowledge - Objective]:** *Define* electrical resistivity. • **[Application - LA]:** *Calculate* the new resistance if a wire is stretched to double its original length.
Resistors in Series & Parallel	**C-8.2:** Designs and implements a plan for scientific inquiry. • *Outcome:* Students will physically construct circuits and calculate equivalent resistance.	• **Mandatory Practical (Exp 5):** Determination of the equivalent resistance of two resistors when connected in series and parallel . • **Circuit Diagramming:** Draw schematic diagrams showing proper placement of ammeters (series) and voltmeters (parallel).	• **[Application - SA]:** *Illustrate* a circuit diagram with three resistors connected in parallel. • **[Analyze & Evaluate - Case-Based]:** *Evaluate* the advantages of a parallel circuit over a series circuit in domestic wiring.

Heating Effect & Electric Power	**C-2.4:** Applies circuit understanding to everyday usage . • *Outcome:* Students will apply Joule's Law of Heating ($H = I^2Rt$) and calculate electric power ($P = VI$).	• **Real-World Connection:** Discuss the working of electric fuses, incandescent bulbs, and electric irons. • **Numerical Practice:** Calculate the interrelation between P, V, I, and R to solve power consumption problems.	• **[Demonstrate Knowledge - VSA]:** *Name* two devices that work on the heating effect of electric current. • **[Application - SA]:** *Calculate* the energy consumed by a 100 W bulb operated for 5 hours.

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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 Ohm's law, identifying symbols in circuit diagrams) .
- **Application of Knowledge/Concepts (30%):** Assessed via questions asking students to *calculate, illustrate, show, adapt, explain, and distinguish* (e.g., calculating equivalent resistance, illustrating circuit layouts) .
- **Formulate, Analyze, Evaluate and Create (20%):** Assessed via questions asking students to *interpret, analyze, compare, contrast, examine, evaluate, discuss, and construct* (e.g., analyzing V-I graphs, evaluating circuit safety) .

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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 4 (Ohm's Law & V-I Graph) and Experiment 5 (Equivalent Resistance) . Students will be assessed on their ability to make tight electrical connections, read ammeters and voltmeters without parallax error, and draw accurate best-fit lines on

graphs.

- **Digital Integration Strategy:** To reinforce circuit building ahead of Periodic Assessments (5+5 Marks), utilize interactive virtual circuit construction kits (such as PhET Interactive Simulations via the DIKSHA portal). This allows students to digitally "blow" virtual fuses, observe electron flow rates, and safely test short-circuit scenarios.
- **Portfolio Task (5 Marks):** Students will *examine* their household electricity bill. They will prepare a brief write-up that *identifies* the unit of commercial energy (kWh), *calculates* the total energy consumed over a week by auditing three major appliances in their home (e.g., refrigerator, fan, television), and proposes two scientific methods to reduce energy consumption. This will be securely added to their academic portfolio.