

CLASS - X
CHAPTER 12: ELECTRICITY
LESSON PLAN - 2

TOPICS	FACTORS ON WHICH RESISTANCE OF A CONDUCTOR DEPENDS COMBINATION OF RESISTORS
DURATION	4 PERIODS (Approx. 40 minutes each) Period 1: Electrical resistance Period 2: Rheostat Period 3: Resistances in Series Combination Period 4: Resistances in Parallel Combination
PRE-REQUISITE FOR THE COURSE	This topic requires knowledge of: Some materials are good conductors while some are poor conductors of electric current.
LEARNING OBJECTIVES	Students will be able to: - Understand how resistance affects the flow of current through the conductor - List the factors on which resistance of a conductor depends - Identify the combination of resistors as series or parallel - Solve numerical problems based on combination of resistors
TEACHING METHODOLOGY	Recapitulation: 5 min Quick revision of the previous topic learnt would be taken up. Transaction of the Lesson Plan: Activity, Think Pair Share The facilitator begins the session with an activity 12.2 mentioned in NCERT. The students observe the current in the Ammeter when (i) Nichrome wire, (ii) 10 W bulb and (iii) Torch bulb, is connected in a circuit. The facilitator explains the difference observed in the reading of ammeter in the three cases and hence explain the cause of resistance. Think Pair Share: Discussion of topic through Collaborative Learning: 15 min (Critical Thinking, Collaboration) Using the knowledge of cause of resistance, the facilitator asks students to predict how would the resistance of a wire (made of one type of material) change: - If it is folded such that its length becomes half? - If wire of same length but different area of section is used? - If a different material wire of same length and same area of cross-section is used? After the discussion, the facilitator then explains why the resistance of the wire in the circuit: (i) is directly proportional to its length, (ii) is inversely proportional to its area of cross-section and (iii) depends on the nature of its material? Discussion of topic and Guided Practice 20 min Inquiry based learning (Critical Thinking and Problem Solving)

	Using the table 12.2 of NCERT- Electrical resistivity of some substances at 20°C, the students are asked to find out the following: • Which material is the best conductor of electricity? • Arrange the resistivity of conductors, insulators and alloys in increasing order. • Which materials are used in electrical heating devices and why? To study the system (or combination) of resistors, the facilitators ask students to predict and observe what happens if in a simple electrical circuit consisting of a bulb B1 connected to a switch and a battery, - bulb B2 is connected in series to B1? - bulb B2 is connected in parallel to B1? Which arrangement is used in domestic circuits – series or parallel? Why? Guided practice followed by Independent Practice- NCERT questions to be discussed in the classroom. Value Points learned: - • Resistance of a conductor depends on its length, area of cross-section and its material. • Resistivity (or conductivity) of a material is its characteristic property. • In a series combination of resistors, same current flows through all the resistors. • In parallel combination of resistors, potential difference across each resistor is same, Closure: 5 min A short oral test would be taken to check proper assimilation of the topic discussed.
Learning Outcomes:	Students would be able to: • Identify the materials as good conductors or insulators on the basis of their resistivity. • To explain the cause of resistance and the factors on which it depends. • Analyse that current remains same in series combination of resistors and potential difference remains same in parallel combination of resistors. • Solve numerical problems based on series and parallel combination of resistors.
SELF-STUDY, HOME WORK, ASSIGNMENTS	Students would do the given questions in their H.W. notebooks: • Will current flow more easily through a thick wire or a thin wire of the same material, when connected to the same source and why? • Why are coils of electric toasters and electric irons made of an alloy rather than a pure metal? • Why is tungsten used exclusively for filament of electric lamps? • Why is the series arrangement not used for domestic circuits?