

CLASS – X
COMPETENCY BASED LESSON PLAN
CHAPTER-ELECTRICITY

Unit	ELECTRICITY
Class Transaction	Total: 10 periods (approx. 40 min each)
Pre-requisite for the course	Students will be able to recall 1. importance of electricity in day to day life 2. materials which are good and bad conductor of electricity.
Assessment of qualifying knowledge	1. Written test 2. Lab activity 3. Group Discussion 4. HW notebook
Objective	To develop scientific temper and inquisitiveness in students. Also students will be able to apply and relate learned concepts in their daily lives.
DOL	<u>D1, D2, D3</u>
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will be able to</i> 1. Define electric current, potential difference, resistance, resistivity and power. 2. Deduce Ohm's law and verify it experimentally. 3. Understand the meaning of 'series and parallel combination' of resistors, learn the way of connecting a given number of resistors Reasons for arrangement of devices, 'in parallel' with each other, in domestic circuits. 4. Describe Heating effect of electric current and derive Joule's law of heating. 5. Find an expression for electric power and derive commercial unit of electrical energy is KWh <u>SKILLS AND COMPETENCIES</u>- <i>Students would be able to</i> 1. Critically solve numerical based on current, potential difference, resistance, resistivity and power. 2. Analyse change in resistance by the change in length and area of wire and series and parallel combination. 3. Collaborate to understand the meaning of 'series and parallel combination' of resistors, learn the way of connecting a given number of resistors Reasons for arrangement of devices, 'in parallel' with each other, in domestic circuits 4. Communicate about applications of Heating Effect of Electric Current in our daily life.
Transaction Methodology (The teacher can	Transaction would proceed in the following manner- <i>Set induction and Brain Storming</i> -The class would start with a discussion

use the mentioned techniques, wherever applicable, and can use any other too.)	on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. <i>Introduction of the topic-</i> ppt and digital content would be shared Group learning- The class will be divided in the group of 5 students. <i>Circle the Sage-</i> The question will be asked by the teacher about the different physical quantities and components of electric circuit and the students who knows the answer will stand at the various corners of the room. (Communication, Collaboration) Differentiation- The students will draw the circuit diagrams and solve numericals. (Critical thinking) Questioning- <i>Multiple level question-</i> Teacher will prepare a list of question about the resistance in series and parallel combination and will ask these questions during discussions. Students will answer (Analytically) <i>Brain Storming-</i>The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. <i>Guided practice followed by Independent Practice-</i> NCERT, Exemplar, spiral questions to be discussed in the classroom. Techniques to be used: Set induction Class discussion' Quiz Daily Practice Problem MCQ Peer Assessment Case Studies Lab Activities Graphic Organizers for different terms Lesson progress using Smart Class Think Pair Share for solving numerical Mind Mapping for lesson summarization Muddiest Point and One Minute Paper for Closure Any Other
Resources	Text Book: NCERT text book for Science NCERT Exemplar

Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W notebooks as mentioned in the monthly planner by which we can assess their critical and creative thinking HW notebooks to be marked as per the given plan: <i>Assessment Parameters:</i> The total marks for the activity is 5 marks On time submission.....1 mark Presentation/ Neatness(creativity).....1 mark Content(analytical and critical thinking).....3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
Assessment	3 UNIT TESTS (20, 30, 30).....80 Marks MID TERM EXAMINATION.....80 Marks HALF YEARLY EXAMINATION.....80 Marks PRE BOARD-I EXAMINATION80 Marks PRE BOARD-II EXAMINATION.....80 Marks ANNUAL BOARD EXAMINATION.....80 Marks PERIODIC TEST By administering pen paper test we assess creativity and critical thinking. Average of the best two tests to be taken that will have a weightage of 10 marks. Best 2 Tests out of: Units tests, Midterm examination, Half Yearly examination. INTERNAL ASSESSMENT20 Marks Periodical Test 10 Marks By administering pen paper test we assess creativity and critical thinking. Subject Enrichment 05 Marks With the help of subject enrichment activities we assess communication, collaboration, character building and citizenship. The students in a group of two will be performing hands on practical of verification of Ohm's law and relate various terms used in daily life Note Book Submission 05 Marks By writing the answers of different levels of question we can assess their knowledge, critical thinking and creativity.
	Due to various social backgrounds and multiple intelligences, the classroom might be a diverse arena. The following techniques can be used

	for various groups: <i>For gifted students:</i> • HOT questions to be done • Encouragement for referring other resources <i>For weak students:</i> • Initially simple questions to be completed • Buddy help to be provided • Provide grade-up classes <i>For differently abled students:</i> • Ignore spelling mistakes and formulae, if not written • Call parents at regular intervals • Provide grade-up classes
Marks	The weightage would be given by CBSE.
Questions	1. State in brief the meaning of an electric circuit. 2. What is meant by potential difference between two points? 3. Name the instrument used for measuring: (i) Potential difference (ii) Current 4. Name the property by virtue of which two conductors having identical structures offer different resistances to the flow of current when connected to the same source of electric current. 5. In an electric circuit state the relationship between the direction of conventional current and the direction of flow of electrons. 6. State Ohm's law. Express it mathematically and apply it to define the unit of resistance. 7. A given length of a wire is doubled on itself and this process is repeated once again. By what factor does the resistance of the wire changes? 8. Determine the ratio of the (a) highest (b) lowest resistance that can be secured by combining four coils of resistance $4\ \Omega$, $8\ \Omega$, $12\ \Omega$, and $24\ \Omega$ in an electric circuit. 9. Why are the heating elements of electric toaster and electric iron made of an alloy rather than pure metal? An electric iron of resistance $20\ \Omega$ takes a current of 5 A. Calculate the heat developed in 30 seconds. 10. Which is having more resistance a 220V, 100 W bulb or a 220V, 60 W bulb?

Topic	DAY 1- concept of Electric Circuit, Electric Current and Potential difference
Class Transaction	40 min each
Pre-requisite for the course	This topic requires basic knowledge of electrons and their flow and cells which is already learnt in class VII and VIII
Assessment of qualifying knowledge	Facilitator asks the students to make down list of resources of current which they use in their own home and compare their list with other students in groups
Objective	Student will be able to understand that what is conventional current and its direction, formulae and unit of current and potential
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will know and understand</i> • Discuss the importance of definitions and units • Appreciate the formulae. <u>SKILLS AND COMPETENCIES</u>- <i>Students would be able to</i> • Critically analyse the numerical and solve • Collaborate to find 1 ampere is equal to how many coulomb Attitudes and beliefs- <i>Students will be able to</i> Develop citizenship by visualizing and observing the quantities in day to day lives and sensitizing others
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- Differentiation- The students will define SI units of current and potential and solve numericals (Character, Citizenship) <i>Guided practice followed by Independent Practice</i>- NCERT questions to be discussed in the classroom. Techniques to be used: Quiz Daily Practice Problem MCQ Peer Assessment Student -teacher interaction, Wipro- G.O.s(web chart, flow chart and differentiation table,compare-contrast matrix),

	silent/ loud reading, collaborative learning, Research work/surveys
Resources	Text Book: NCERT text book for Science. Reference Book NCERT Exemplar
Closure	Involving students in summarizing by asking them to prepare questions based on the topic.
Self Study, Home Work, Assignments	Independent Practice: Spiral level 1 Questions
Assessments	Assessment of skit presented by various groups on the basis of content, communication, collaboration, time management and message given by each group to sensitize others.
Addressing Classroom Diversity	Due to various social backgrounds and multiple intelligences, the classroom might be a diverse arena. The following techniques can be used for various groups: <i>For gifted students:</i> • HOT questions to be done • Encouragement for referring other resources <i>For weak students:</i> • Initially simple to be completed • Buddy help to be provided • Provide grade-up classes <i>For differently abled students:</i> • Ignore spelling mistakes. • Call parents at regular intervals • Provide grade-up classes

Unit	Day 2 -Circuit diagram
Class Transaction	40 min each
Pre-requisite for the course	This topic requires basic knowledge of components of the circuit which is already learnt in class VII and VIII
Assessment of qualifying knowledge	Written test Lab activity Group Discussion HW notebook

Objective	Students will be able to identify the symbols of cell, battery resistance switch and other components and draw circuit diagrams.
DOL	D1, D2, D3
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will be able to</i> Students will gain the skill to draw circuit diagrams. Students will recognize the function of every component in the circuit <u>SKILLS AND COMPETENCIES</u>- <i>Students would be able to</i> Communicate about different symbols used in circuit diagram and their importance
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- <i>Set induction and Brain Storming</i>-The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. <i>Introduction of the topic</i>- ppt and digital content would be shared Differentiation- The students will draw the circuit diagrams. (Critical thinking) Questioning- Multiple <i>level question</i>- Teacher will prepare a list of question about the resistance in series and parallel combination and will ask these questions during discussions. Students will answer (Analytically) <i>Guided practice followed by Independent Practice</i>- NCERT, Exemplar, spiral questions to be discussed in the classroom. Techniques to be used: Set induction Class discussion' Quiz Daily Practice Problem MCQ Peer Assessment Case Studies Lab Activities Graphic Organizers for different terms Lesson progress using Smart Class Think Pair Share for solving numerical

	Mind Mapping for lesson summarization Muddiest Point and One Minute Paper for Closure Any Other
Resources	Text Book: NCERT text book for Science Reference Book NCERT Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W notebooks as mentioned in the monthly planner by which we can assess their critical and creative thinking HW notebooks to be marked as per the given plan: <i>Assessment Parameters:</i> The total marks for the activity is 5 marks On time submission.....1 mark Presentation/ Neatness(creativity).....1 mark Content(analytical and critical thinking).....3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
Assessment	The students in a group of two will be performing activity of connecting an electric circuit. By writing the answers of three different difficulty level of question we can assess their knowledge (remembering type questions) critical thinking(analytical questions), creativity(HOT questions)
Addressing Classroom Diversity	Due to various social backgrounds and multiple intelligences, the classroom might be a diverse arena. The following techniques can be used for various groups: <i>For gifted students:</i> • HOT questions to be done • Encouragement for referring other resources <i>For weak students:</i> • Initially simple to be completed • Buddy help to be provided • Provide grade-up classes <i>For differently abled students:</i> • Ignore spelling mistakes and formulae, if not written • Call parents at regular intervals • Provide grade-up classes

Marks	The weightage would be given by CBSE.

Unit	Day 3 -Resistance
Class Transaction	40 min each
Pre-requisite for the course	This topic requires basic knowledge of current and potential difference which is already learnt
Assessment of qualifying knowledge	Written test Lab activity Group Discussion HW notebook
Objective	Students will be able to relate that potential difference is directly proportional to current and plot V-I graph to calculate Resistance.
DOL	D1, D2, D3
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will be able to</i> • Students will understand concept of resistance. • Students will gain the skill to draw circuit diagrams. <u>SKILLS AND COMPETENCIES</u>- <i>Students would be able to</i> Critically solve numerical based on current, potential difference, and Resistance.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- <i>Set induction and Brain Storming</i>-The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. <i>Introduction of the topic</i>- ppt and digital content would be shared Differentiation- The students will able to calculate resistance by graphical and mathematical method. (Critical thinking) <i>Guided practice followed by Independent Practice</i>- NCERT, Exemplar, spiral questions to be discussed in the classroom. Techniques to be used: Set induction Class discussion' Quiz

	Daily Practice Problem MCQ Peer Assessment Case Studies Lab Activities Graphic Organizers for different terms Lesson progress using Smart Class Think Pair Share for solving numerical Mind Mapping for lesson summarization Muddiest Point and One Minute Paper for Closure Any Other
Resources	Text Book: NCERT text book for Science Reference Book CBSE Exemplar DPSG Spiral
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W notebooks as mentioned in the monthly planner by which we can assess their critical and creative thinking HW notebooks to be marked as per the given plan: <i>Assessment Parameters:</i> The total marks for the activity is 5 marks On time submission.....1 mark Presentation/ Neatness(creativity).....1 mark Content (analytical and critical thinking).....3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
Assessment	By writing the answers of three different difficulty level question we can assess their knowledge (remembering type questions) critical thinking(analytical questions), creativity(HOT questions)
Addressing Classroom Diversity	Due to various social backgrounds and multiple intelligences, the classroom might be a diverse arena. The following techniques can be used for various groups: <i>For gifted students:</i> • HOT questions to be done • Encouragement for referring other resources <i>For weak students:</i> • Initially simple to be completed

	• Buddy help to be provided • Provide grade-up classes <i>For differently abled students:</i> • Ignore spelling mistakes and formulae, if not written • Call parents at regular intervals • Provide grade-up classes
Marks	The weightage would be given by CBSE.

Unit	Day 4 -Resistivity
Class Transaction	40 min each
Pre-requisite for the course	This topic requires basic knowledge of current, potential difference and resistance which is already learnt.
Assessment of qualifying knowledge	Written test Lab activity Group Discussion HW notebook
Objective	To develop scientific temper and inquisitiveness in students. Also, students will be able to apply and relate learned concepts in their daily lives.
DOL	D1, D2, D3
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will be able to</i> Students will be able to define and solve numerical problems based on resistivity. <u>SKILLS AND COMPETENCIES</u>- <i>Students would be able to</i> Critically solve numerical based on Resistivity. Analyse change in resistance by the change in length and area of wire.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- <i>Set induction and Brain Storming</i>-The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. <i>Introduction of the topic</i>- ppt and digital content would be shared Differentiation- The students will be able to solve numerical based on resistivity. (Critical thinking)

	<i>Guided practice followed by Independent Practice-</i> NCERT, Exemplar, other questions to be discussed in the classroom. Techniques to be used: Set induction Class discussion' Quiz Daily Practice Problem MCQ Peer Assessment Case Studies Lab Activities Graphic Organizers for different terms Lesson progress using Smart Class Think Pair Share for solving numerical Mind Mapping for lesson summarization Muddiest Point and One Minute Paper for Closure Any Other
Resources	Text Book: NCERT text book for Science NCERT Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W notebooks as mentioned in the monthly planner by which we can assess their critical and creative thinking HW notebooks to be marked as per the given plan: <i>Assessment Parameters:</i> The total marks for the activity is 5 marks On time submission.....1 mark Presentation/ Neatness(creativity).....1 mark Content (analytical and critical thinking)3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
Assessment	The students in a group of two will be performing hands on practical of verification of Ohm's law and relate various terms used in daily life Note Book Submission 05 Marks By writing the answers of three different levels of question we can assess their knowledge (simple knowledge based questions) critical thinking (application based questions), creativity (HOT questions)
Addressing Classroom Diversity	Due to various social backgrounds and multiple intelligences, the classroom might be a diverse arena. The following techniques can be used for various groups:

	<i>For gifted students:</i> • HOT questions to be done • Encouragement for referring other resources <i>For weak students:</i> • Simple knowledge based questions to be completed • Buddy help to be provided • Provide grade-up classes <i>For differently abled students:</i> • Ignore spelling mistakes and formulae, if not written • Call parents at regular intervals • Provide grade-up classes
Marks	The weightage would be given by CBSE.

Unit	Day 5-series combination of resistance.
Class Transaction	40 min each
Pre-requisite for the course	This topic requires basic knowledge of resistance which is already learnt in previous class.
Assessment of qualifying knowledge	Written test Lab activity Group Discussion HW notebook
Objective	Students will be able to make a circuit of series combination, derive relation of equivalent resistance in series combination and solve numerical based on series combination in their notebook with 90% accuracy
DOL	D1, D2, D3
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will be able to</i> • The students will be demonstrated hands on activity 12.4 and 12.5 of NCERT of making simple electric circuit for series combination of resistors. • The students will make simple electric circuit for series combination of resistors resistors. • The students will derive relation equivalent resistance for series combination of resistors. • The students will solve numericals based on resistance combination and circuit analysis using think pair square. <u>SKILLS AND COMPETENCIES</u>- <i>Students would be able to</i>

	Critically solve numerical based on series combination of resistance.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- <i>Set induction and Brain Storming</i>-The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. <i>Introduction of the topic</i>- ppt and digital content would be shared Questioning- Multiple <i>level question</i>- Teacher will prepare a list of question about the resistance in combination and will ask these questions during discussions. Students will answer (Analytically) <i>Guided practice followed by Independent Practice</i>- NCERT, Exemplar, spiral questions to be discussed in the classroom. Techniques to be used: Set induction Class discussion' Quiz Daily Practice Problem MCQ Peer Assessment Case Studies Lab Activities Graphic Organizers for different terms Lesson progress using Smart Class Think Pair Share for solving numerical Mind Mapping for lesson summarization Muddiest Point and One Minute Paper for Closure Any Other
Resources	Text Book: NCERT text book for Science NCERT Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W notebooks as mentioned in the monthly planner by which we can assess their critical and creative thinking HW notebooks to be marked as per the given plan:

	<i>Assessment Parameters:</i> The total marks for the activity is 5 marks On time submission.....1 mark Presentation/ Neatness(creativity).....1 mark Content(analytical and critical thinking).....3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
Assessment	With the help of subject enrichment activities we assess communication ,collaboration, character building and citizenship. The students in a group of two will be performing hands on practical of verification of series combination.
Addressing Classroom Diversity	Due to various social backgrounds and multiple intelligences, the classroom might be a diverse arena. The following techniques can be used for various groups: <i>For gifted students:</i> • HOT questions to be done • Encouragement for referring other resources <i>For weak students:</i> • Initially Knowledge based questions to be completed • Buddy help to be provided • Provide grade-up classes <i>For differently abled students:</i> • Ignore spelling mistakes and formulae, if not written • Call parents at regular intervals • Provide grade-up classes
Marks	The weightage would be given by CBSE.

Unit	Day 7- Parallel combination of resistance.
Class Transaction	40 min each
Pre-requisite for the course	This topic requires basic knowledge of resistance which is already learnt in class.
Assessment of qualifying knowledge	Written test Lab activity Group Discussion HW notebook
Objective	Students will be able to make simple circuit of parallel combination, derive relation of equivalent resistance in parallel combination and solve

	numerical based on parallel combination in their notebook with 90% accuracy
DOL	D1, D2, D3
Learning Outcomes	<u>KNOWLEDGE</u>- <i>Students will be able to</i> • The students will be demonstrated hands on activity 12.5 of NCERT of making simple electric circuit for parallel combination of • The students will make simple electric circuit for parallel combination of resistors. • The students will derive relation equivalent resistance for parallel combination of resistors. • The students will solve numericals based on resistance combination and circuit analysis using think pair square. <u>SKILLS AND COMPETENCIES</u>- <i>Students would be able to</i> 1. Critically solve numerical based on Resistance. 2. Analyse change in resistance by the change in length and area of wire and series and parallel combination. 3. Communicate about importance of parallel combination in domestic circuit.
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- <i>Set induction and Brain Storming</i>-The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. <i>Introduction of the topic</i>- ppt and digital content would be shared Differentiation- The students will draw the circuit diagrams. (Critical thinking) Questioning- Multiple level question- Teacher will prepare a list of question about the resistance in series and parallel combination and will ask these questions during discussions. Students will answer (Analytically) <i>Guided practice followed by Independent Practice</i>- NCERT, Exemplar, spiral questions to be discussed in the classroom. Techniques to be used: Set induction Class discussion'

	Quiz Daily Practice Problem MCQ Peer Assessment Case Studies Lab Activities Graphic Organizers for different terms Lesson progress using Smart Class Think Pair Share for solving numerical Mind Mapping for lesson summarization Muddiest Point and One Minute Paper for Closure Any Other
Resources	Text Book: NCERT text book for Science NCERT Exemplar DPSG Spiral
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W notebooks as mentioned in the monthly planner by which we can assess their critical and creative thinking HW notebooks to be marked as per the given plan: <i>Assessment Parameters:</i> The total marks for the activity is 5 marks On time submission.....1 mark Presentation/ Neatness(creativity).....1 mark Content (analytical and critical thinking)3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
Assessment	3 UNIT TESTS (20, 30, 30)80 Marks MID TERM EXAMINATION.....80 Marks HALF YEARLY EXAMINATION.....80 Marks PRE-BOARD-I EXAMINATION80 Marks PRE-BOARD-II EXAMINATION.....80 Marks ANNUAL BOARD EXAMINATION.....80 Marks PERIODIC TEST By administering pen paper test, we assess creativity and critical thinking. Average of the best two tests to be taken that will have a weightage of 10 marks. Best 2 Tests out of: Units tests, Midterm examination, Half Yearly examination.

	INTERNAL ASSESSMENT20 Marks Periodical Test 10 Marks By administering pen paper test we assess creativity and critical thinking. Subject Enrichment 05 Marks With the help of subject enrichment activities we assess communication ,collaboration, character building and citizenship. The students in a group of two will be performing hands on practical of parallel combination and relate to various terms used in daily life Note Book Submission 05 Marks By writing the answers of three different levels of questions we can assess their knowledge (remembering type questions) critical thinking (analytical questions), creativity(HOT questions)
	Due to various social backgrounds and multiple intelligences, the classroom might be a diverse arena. The following techniques can be used for various groups: <i>For gifted students:</i> • HOT questions to be done • Encouragement for referring other resources <i>For weak students:</i> • Initially simple remembering type questions to be completed • Buddy help to be provided • Provide grade-up classes <i>For differently abled students:</i> • Ignore spelling mistakes and formulae, if not written • Call parents at regular intervals • Provide grade-up classes
Marks	The weightage would be given by CBSE.

Unit	Day 7- Joule's law of heating
Class Transaction	40 min each
Pre-requisite for the course	This topic requires basic knowledge of components of the circuit which is already learnt in class VII and VIII
Assessment of qualifying knowledge	Written test Lab activity Group Discussion HW notebook

Objective	The students will be able to establish the relation between, H, I, R and t, discuss practical problem due to heating and solve numericals based on heat produced.
DOL	D1, D2, D3
Learning Outcomes	<u>KNOWLEDGE-</u> • The students will derive Joule's law of heating. • The students will solve numericals based on heating effect of electric current. • The students will discuss different applications of heating effect of electric current. • The students will solve practical problems and numericals based on heating effect of electric current. <u>SKILLS AND COMPETENCIES-</u> <i>Students would be able to</i> Critically solve numerical based on heating effect of current. Communicate about different components of domestic circuit and their importance
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- <i>Set induction and Brain Storming</i>-The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. <i>Introduction of the topic</i>- ppt and digital content would be shared Differentiation- The students will solve numericals. (Critical thinking) <i>Guided practice followed by Independent Practice</i>- NCERT, Exemplar questions to be discussed in the classroom. Techniques to be used: Set induction Class discussion' Quiz Daily Practice Problem MCQ Peer Assessment Case Studies Lab Activities

	Graphic Organizers for different terms Lesson progress using Smart Class Think Pair Share for solving numerical Mind Mapping for lesson summarization Muddiest Point and One Minute Paper for Closure Any Other
Resources	Text Book: NCERT text book for Science NCERT Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W notebooks as mentioned in the monthly planner by which we can assess their critical and creative thinking HW notebooks to be marked as per the given plan: <i>Assessment Parameters:</i> The total marks for the activity is 5 marks On time submission.....1 mark Presentation/ Neatness(creativity).....1 mark Content(analytical and critical thinking).....3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
Assessment	With the help of subject enrichment activities we assess communication ,collaboration, character building and citizenship. The students in a group of two will be performing hands on activity of verifying Joule's law By writing the answers of three different types of question we can assess their knowledge (remembering questions) critical thinking (analytical questions), creativity(HOT questions)
Addressing Classroom Diversity	Due to various social backgrounds and multiple intelligences, the classroom might be a diverse arena. The following techniques can be used for various groups: <i>For gifted students:</i> • HOT questions to be done • Encouragement for referring other resources <i>For weak students:</i> • Simple remembering type to be completed • Buddy help to be provided • Provide grade-up classes

	<i>For differently abled students:</i> • Ignore spelling mistakes and formulae, if not written • Call parents at regular intervals • Provide grade-up classes
Marks	The weightage would be given by CBSE.

Unit	Day 8- Electrical Power and commercial unit of electrical energy
Class Transaction	40 min each
Pre-requisite for the course	This topic requires basic knowledge of components of the circuit which is already learnt in class VII and VIII
Assessment of qualifying knowledge	Written test Lab activity Group Discussion HW notebook
Objective	To students will be able to apply formula of power and establish the relation between electrical unit and commercial unit of energy.
DOL	D1, D2, D3
Learning Outcomes	<u>KNOWLEDGE-</u> The students will be able to define electric power and commercial unit of electric energy <u>SKILLS AND COMPETENCIES-</u> <i>Students would be able to</i> Critically solve numerical based on power. Communicate about different components of domestic circuit and their importance
Transaction Methodology (The teacher can use the mentioned techniques, wherever applicable, and can use any other too.)	Transaction would proceed in the following manner- <i>Set induction and Brain Storming-</i>The class would start with a discussion on what the students have already learnt in the previous classes and hence what is it that they would learn now. They would also be told the significance of the topic that they would be studying. <i>Introduction of the topic-</i> ppt and digital content would be shared Differentiation- The students will able to apply formula of power to solve numerical. (Critical thinking) <i>Guided practice followed by Independent Practice-</i> NCERT, Exemplar questions to be discussed in the classroom.

	Techniques to be used: Set induction Class discussion' Quiz Daily Practice Problem MCQ Peer Assessment Case Studies Lab Activities Graphic Organizers for different terms Lesson progress using Smart Class Think Pair Share for solving numerical Mind Mapping for lesson summarization Muddiest Point and One Minute Paper for Closure Any Other
Resources	Text Book: NCERT text book for Science NCERT Exemplar
Self Study, Home Work, Assignments	Independent Practice: Students would do the questions in their H.W notebooks as mentioned in the monthly planner by which we can assess their critical and creative thinking HW notebooks to be marked as per the given plan: <i>Assessment Parameters:</i> The total marks for the activity is 5 marks On time submission.....1 mark Presentation/ Neatness(creativity).....1 mark Content(analytical and critical thinking).....3 marks It is also advised that the students come to the class with proper background knowledge of the topic under discussion. They can refer to the resources stated above.
Assessment	By writing the answers of three different levels of question we can assess their knowledge (simple remembering type questions) critical thinking(analytical questions), creativity(HOT questions)
Addressing Classroom Diversity	Due to various social backgrounds and multiple intelligences, the classroom might be a diverse arena. The following techniques can be used for various groups: <i>For gifted students:</i> • HOT questions to be done • Encouragement for referring other resources

	<i>For weak students:</i> • Simple remembering type questions to be completed • Buddy help to be provided • Provide grade-up classes <i>For differently abled students:</i> • Ignore spelling mistakes and formulae, if not written • Call parents at regular intervals • Provide grade-up classes
Marks	The weightage would be given by CBSE.

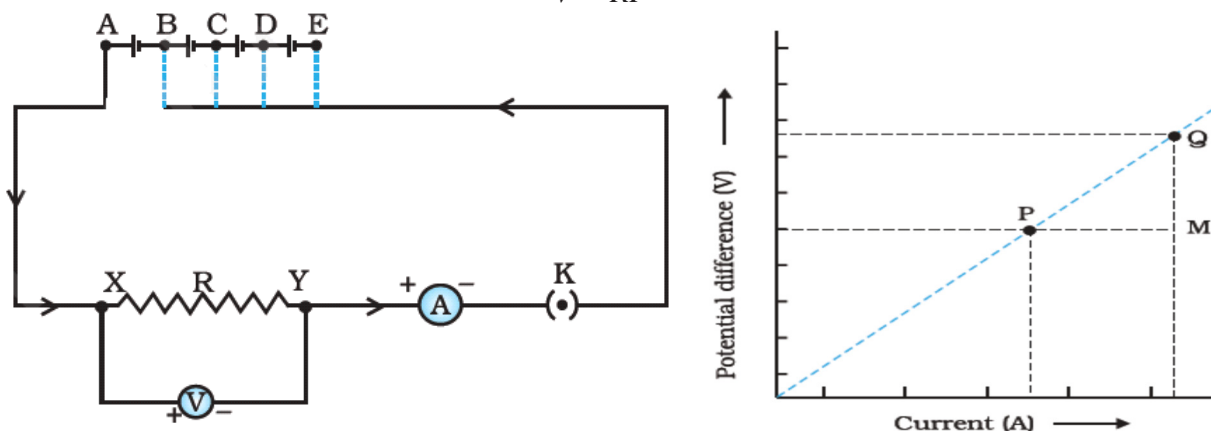
Day: 9

Aim: To study the dependence of the potential difference across a resistor on the current through it and to determine its resistance and to verify the Ohm's law.

Material required: A resistor of about $5\ \Omega$, an ammeter (0 - 3 A), a voltmeter (0 - 10 V), 4 dry cells of 1.5 V each a battery eliminator, a plug key, connecting wires, sand paper.

Theory: According to the Ohm's law, the potential difference (V) across the ends of a resistor is directly proportional to the current (I) through it provided its temperature remains the same.

$$V = RI$$



R is a constant for the given resistor at a given temperature and is called its resistance. A graph between the potential difference across the two ends of a resistor and the current through it is a straight line passing through the origin. The slope of this graph gives the resistance R of the resistor.

Procedure:

1. Note the range and least count of the given ammeter and the voltmeter.
2. Set up the circuit by connecting different components with the help of connecting wires.
3. Initially connect only one cell in the circuit. In case a battery eliminator is used, keep the rating of the eliminator at the minimum
4. Insert the key in the plug and note the readings of ammeter and voltmeter and record them.
5. Now instead of using one cell in the circuit, connect two cells in the circuit.

6. Note and record the voltmeter and ammeter readings.
7. Repeat the experiment by connecting three and four cells in the circuit.

Observation and calculation:

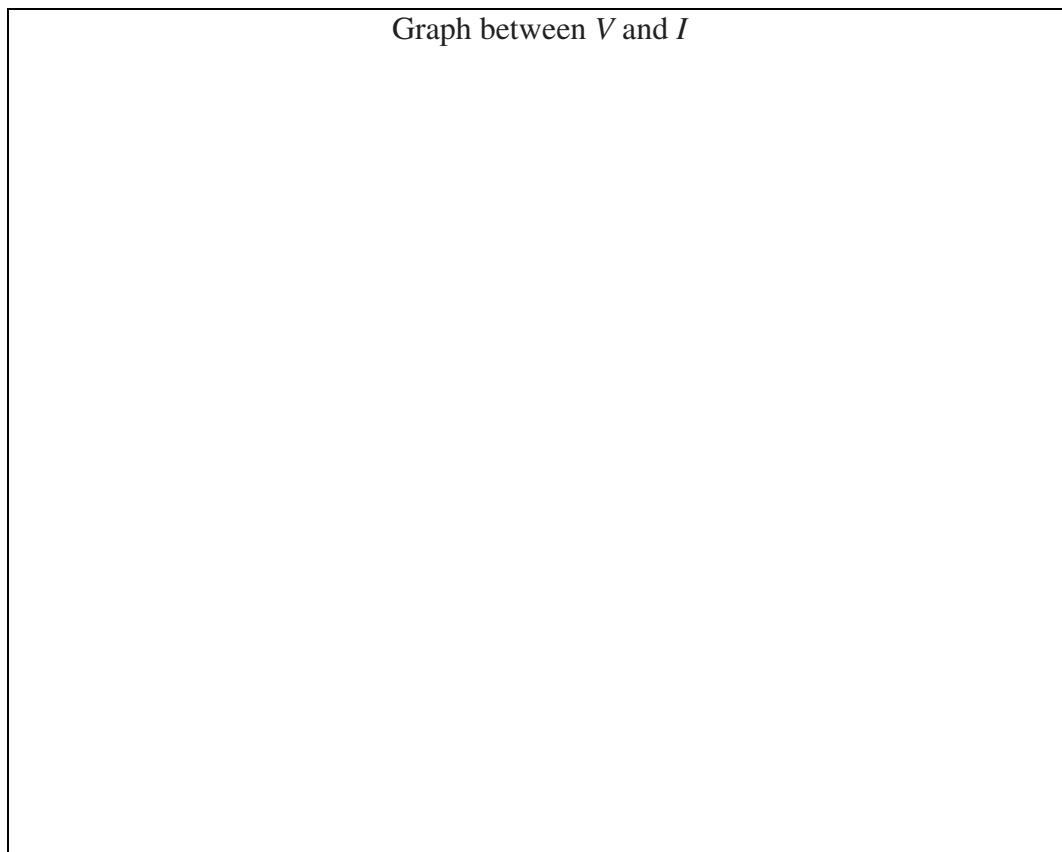
- (i) Range of the ammeter = ____ - ____ A.
- (ii) Least count of the ammeter = ____ A.
- (iii) Range of the voltmeter = ____ - ____ V.
- (iv) Least count of the voltmeter = ____ V.

Mean value of resistance R of the resistor = ____ Ω

S.No	Current through the resistor I	Potential difference across the end of resistor V	Resistance of the resistor $R = V/I$
	(A)	(V)	(Ω)
1			
2			
3			
4			

Graph: Plot the graph with I and V along the x - and y -axes respectively on the graph paper. Find the slope of this graph by choosing two points P and Q on it.

$$\text{Slope} = QM/MP$$



Result: Resistance obtained from the calculations = ____ Ω
 Resistance obtained from the graph = ____ Ω

- The value of resistance R of resistor for all values of current through it remains the same (or almost same). The graph between V and I is a straight line and passes through the origin. This verifies the Ohm's law.

Precautions:

1. The connecting wires should be thick copper wires and the insulation of their ends should be removed using the sand paper.
2. Connections should be tight otherwise some external resistance may introduce in the circuit.
3. The ammeter should be connected in series with the resistor such that the current enters at the positive terminal and leaves at the negative terminal of the ammeter.
4. Voltmeter should always be connected in parallel to resistor.
5. The pointers of the ammeter and voltmeter should be at zero mark when no current through the circuit.

Day: 10

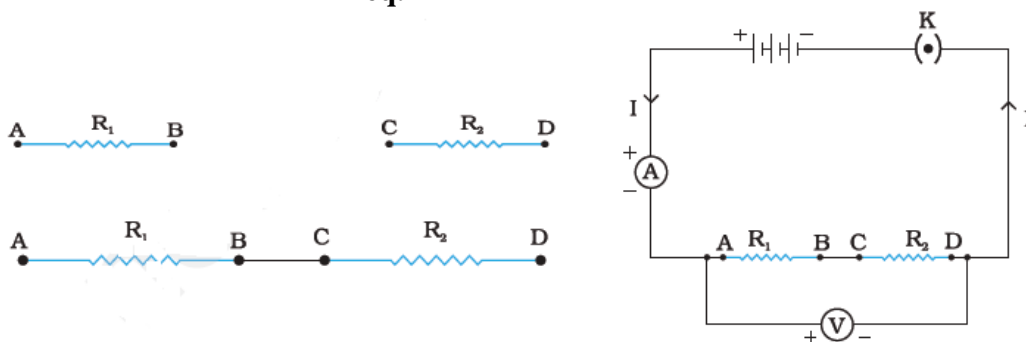
EXPERIMENT No. 2

Aim: To determine the equivalent resistance of two resistors connected in series combination.

Material required: Two resistors of (each of $2\ \Omega$ resistance), an ammeter (range $0 - 5\ \text{A}$), a voltmeter (range $0 - 5\ \text{V}$), three dry cells of $1.5\ \text{V}$ each a plug key, connecting wires.

Theory: When two resistors of resistance R_1 and R_2 respectively are connected in a series combination. then their equivalent resistance R_s is given by

$$R_s = R_1 + R_2 \text{ ----- eq. 1}$$



Procedure:

1. Note the range and least count of the given ammeter and the voltmeter.
2. Place the given resistors one after the other and join the ends.
3. Set up the circuit by connecting different components with the help of connecting wires as shown in the circuit diagram.
4. Make sure that the positive and negative terminals of the ammeter and voltmeter are correctly connected in the circuit.
5. Insert the key in the plug and note the readings of ammeter and voltmeter and record them.
6. Repeat the activity for three different values of current through the circuit and record the readings of the ammeter and voltmeter in each case.

Observation and calculation: Range of the ammeter = ____ - ____ A.

Least count of the ammeter = ____ A.

Range of the voltmeter = ____ - ____ V.

Least count of the voltmeter = ____ V.

Resistance of first resistor R_1 = ____ Ω , Resistance of second resistor, R_2 = ____ Ω

S. No.	Current through the series combination, I_s	Potential difference across the series V_s	Equivalent Resistance of combination, $R_s = V_s / I_s$	Average value of R_s
	(A)	(V)	(Ω)	(Ω)
1				
2				
3				
4				

R_1 = ____ Ω , R_2 = ____ Ω

Equivalent resistance = $R_1 + R_2$ = ____ Ω

Result: Resistance of the series combination (from observation table) : _____ Ω

Resistance of the series combination (calculated by using Eq. 1) : _____ Ω

Precaution:

1. The connecting wires should be thick copper wires and the insulation of their ends should be removed using the sand paper.
2. Connections should be tight otherwise some external resistance may introduce in the circuit.
3. The ammeter should be connected in series with the combination of resistors such that the current enters at the positive terminal and leaves at the negative terminal of the ammeter.
4. Voltmeter should always be connected in parallel to the combination of resistors.
5. The pointers of the ammeter and voltmeter should be at zero mark when no current flows through the circuit..
6. Current should be passed through the circuit for a short time while taking observations; otherwise current would cause unnecessary heating in the circuit. Heating may change the resistance of resistors.

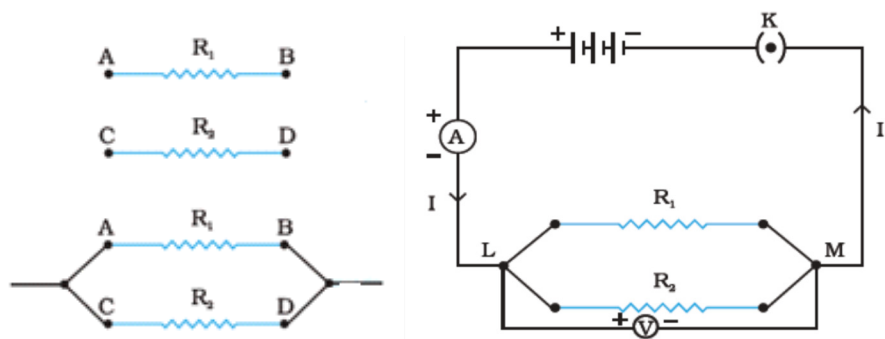
EXPERIMENT No. 3

Aim: To determine the equivalent resistance of two resistors connected in parallel combination.

Material required: Two resistors of (each of 2 Ω resistance), an ammeter (range 0 – 5 A), a voltmeter (range 0 – 5 V), three dry cells of 1.5 V each , a plug key, connecting wires,

Theory: When two resistors of resistance R_1 and R_2 respectively are connected in a parallel combination then their equivalent resistance R_P is given by

Equivalent resistance(R_P) = $R_1 R_2 / (R_1 + R_2)$



Procedure:

1. Note the range and least count of the given ammeter and the voltmeter.
2. Place the given resistors side by side and join end A with the end C, and end B with end D.
3. Set up the circuit by connecting different components with the help of connecting wires as shown in the circuit diagram .
4. Note the readings of the ammeter and voltmeter and record them.
5. Repeat the activity for three different values of current through the circuit and record the readings of the ammeter and voltmeter in each case.

Observation and calculation:

- (i) Range of the ammeter = ____ - ____ A.
- (ii) Least count of the ammeter = ____ A.
- (iii) Range of the voltmeter = ____ - ____ V.
- (iv) Least count of the voltmeter = ____ V
- (vi) Resistance of first resistor, R_1 = ____ Ω , Resistance of second resistor, R_2 = ____ Ω

S.No.	Current through the parallel combination, I_P	Potential difference across the parallel combination, V_P	Equivalent Resistance of combination, R_P $R_P = V_P / I_P$	Average value of R_P
	(A)	(V)	(Ω)	(Ω)

R_1 = ____ Ω , R_2 = ____ Ω

Equivalent resistance = $R_1 R_2 / (R_1 + R_2)$

Result and discussion: Resistance of the parallel combination (from observation table): ____
Resistance of the parallel combination (calculated by using Eq. 1): ____

Precautions:

1. The connecting wires should be thick copper wires and the insulation of their ends should be removed using the sand paper.
2. Connections should be tight otherwise some external resistance may introduce in the circuit.

3. The ammeter should be connected in series with the combination of resistors such that the current enters at the positive terminal and leaves at the negative terminal of the ammeter.
4. Voltmeter should always be connected in parallel to the combination of resistors.
5. The pointers of the ammeter and voltmeter should be at zero mark when no current flows through the circuit..