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| **Topic Name**: | Series and Parallel connection of Resistors |
| **Teaching Point**: |  |
| **Learning Objectives**: | * Explain the concept of series connection of resistors * Explain the concept of parallel connection of resistors * Calculation of equivalent resistances |

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| **Secondary Curriculum Mapping** | | | |
| **Board** | **Std.** | **Book Reference** | **Sub-Topic** |
|  |  |  | Series connection of resistors  Parallel connection of resistors  Calculation of equivalent resistances |
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| **Media Details** | | | | | |
| **Media Title**: Series and parallel connection of resistors | | **Media Type** (Select one)**:** Animation | | | **Icon**: |
| **Structure of MM:** Single Screen Animation | | | | | **2D/3D/Combo**: 2D |
| **Approx. Playing Time**: 5 minutes | | | | | |
| **MM Description**: This topic describes about the types of connection of resistors and its comparison. | | | | | |
| **Keywords: Series connection, parallel connection of resistors** | | | | | |
| **Asset Reference**: | | | | | |
| **MM Writer:** | Hemalatha A | | **Extn.** |  | |

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| **Screen Number: 1** | | |
| **Notes to Graphics** | **On screen text** | **Voiceover** |
| Appear the below resistor one by one manner when VO reads the first part.    Appear the image one by one by sync with VO of second part.        For the third part highlight the second and third image with naming. | **Screen Header: Series and Parallel connection of resistors**  **Image Label:**  **Second image:**  Series connection  Third image:  Parallel connection  Fourth image:  Both | When two or more resistors are presented in an electric circuit how could we connect them?  We can connect them in series connection, parallel connection or combinations of both.  Let us understand the series and parallel connection of resistors through a tollbooth analogy. |
| Show the below image like forming when VO reads the first part.    When VO reads the second part animate like adding toll booths to the previous image as shown below. And that time appear the TOS.  When VO reads, the last line animate like car moving across each tollbooth. | **TOS:**  **One after another is termed as series connection** | Consider a tollbooth on a highway road.  When two or more tollbooths are added in manner one after other as shown is referred to as a series connection.  Here the cars must cross through every tollbooth. |
| When VO reads the first part rearrange the prevuious image and display as shown below then appear the text.  When VO reads the second part animate like cars moving in all ways.    When VO reads the third part highlight the tollbooth and show the label then highlight the cars moving and show the second label. | **TOS 1:**  **Arranged in side by side manner is termed as parallel connection.**  **Label:**  **Resistor**  **Current** | Well, if these tollbooths are added in a side by side manner as shown is referred to as a parallel connection.  Where the cars can pass through any one of these tollbooths.  Here the tollbooths are analogous to resistors then cars are analogous to current flow. |
| Appear both the images side by side. |  | Let us discuss each of the connection in detail. |

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| **Screen Number: 2** | | |
| **Notes to Graphics** | **On screen text** | **Voiceover** |
| When VO reads appear all the resistor and then connect them. Appear the arrow mark with naming I by sync with VO. | **Screen Header: Series connection of resistors**  **Label:**  **Series connection of resistors** | Two or more resistors are connected one after another in such way that circuit provides only one path for flow of current is termed as series connection of resistors. |
| When VO reads retain the previous image and appear the naming a given below then TOS by sync with VO. | **TOS 1:**  **Current I = Same**  **Voltage drop = Different** | So that the current flowing through each resistor is same, I but the voltage drop across each resistor is different and it named as V1, V2, V3. |
| Retain the previous image and then appear the equation. | **TOS:** | The equivalent resistance of the circuit, R is the sum of the individual resistances R1, R2 and R3. |
| Appear the image by fade out followed by the textwhen VO reads the first part.  Image result for serial lighting images  When VO reads the second part make a call out the previous image and show the below image and make them glow simultaneously by sync with VO.  Image result for series  connection of  bulb | **TOS:**  **Serial lighting** | A real-time example for the series connection of resistors is serial lighting.  Here, the bulbs are connected in series and every bulb turned on simultaneously. |
| When Vo reads retain the previous image and show one bulb get fused and that time make other bulbs also turned off. | **TOS 1:**  **Disadvantage:**  Failure in one bulb will break the entire circuit | The major disadvantage is failure in one bulb will break the entire circuit. |

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| **Screen Number: 3** | | |
| **Notes to Graphics** | **On screen text** | **Voiceover** |
| When VO reads appear all the resistor and then connect them. Appear the arrow mark with naming by sync with VO. | **Screen Header: Parallel connection of resistors**  **Label:**  **Series connection of resistors** | Two or more resistors are connected in a separate branch in such way that circuit provides more than one path for current flow which is termed as parallel connection of resistors. |
| When VO reads retain the previous image and appear arrow mark with naming with TOS. Then appear the naming V and TOS as per VO. | **TOS 1:**  **Current I = Different**  **Voltage drop = Same** | Here the current flowing through each resistor in each branch is different but the voltage drop across each resistor is same. |
| Retain the previous image and then appear the equation. | **TOS:** | The reciprocal of the equivalent resistance of the circuit, R is the sum of the reciprocal of the individual resistances R1, R2 and R3. |
| When Vo reads the first part appear the image by zoom in into the room and appear the TOS by sync.  When VO reads the second part show the switch on the wall by call out and show the center bulb in the room starts to glow.  Image result for parallel lighting in home | **TOS:**  **Lightning and electrical appliances in homes** | A real-time example for the parallel connection of resistors is lightning and electrical appliances in homes.  Here, every bulb can be turned on individually based on need. |
| When VO reads fade the previous image and set as a BG then appear the below image by one bulb get fused and two other bulb are glowing.  Image result for parallel lighting in home | **TOS 1:**  **Advantage:**  Failure in one bulb will not affect the rest of the circuit. | The major advantage is failure in one bulb will not affect the rest of the circuit. |

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| **Screen Number: 4** | | |
| **Notes to Graphics** | **On screen text** | **Voiceover** |
| When VO reads appear both the image side by side ass a tabular column with label then appear the values. | **Screen Header:** Calculation of equivalent resistance  Label:  Series connection  Parallel connection | Consider a series and parallel circuit as shown with same resistor value. |
| Retain the previous image.  When Vo reads the first part highlight the three resistors in the first image.  When VO reads the second part appear the first equation and then bring the values from the circuit for second equation. | **TOS 1:** | For series combination, equivalent resistance is given by sum of all three one ohm resistor.  Which is R equivalent is equal to R1 plus R2 plus R3 that is three ohm. |
| When Vo reads the first part appear the first equation below the second image.  When VO reads the second part appear the second equation from the circuit then third equation as per VO.  When VO reads the third part appear the last equation as per VO. | **TOS:** | For parallel combination, equivalent resistance is given by one by R equivalent is equal to one by R1 plus one by R2 plus one by R3.  By substituting the values we get three ohms and taking reciprocal we get one by three ohm.  From this we can understand that parallel combination offers less resistance while comparing to series combination. |

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| **Screen Number: 5** | | |
| **Notes to Graphics** | **On screen text** | **Voiceover** |
| When VO reads appear the image and then by side show the TOS.  Image result for serial lighting images  When VO reads appear the image and then by side show the TOS.  Image result for parallel lighting in home | **Screen Header: Summary**  **Series and parallel connection of resistors**  **Series connection of resistor**  Resistors are connected one after another.  Current through the resistors are same.  Voltage drop across the resistors are different.  Equivalent resistances are the sum of the individual resistances.  **Parallel connection of resistor**  Resistors are connected in separate branch.  Current through the resistor is different.  Voltage drop across each resistor is same.  Reciprocal of equivalent resistance is equal to the sum of reciprocal of the individual resistances. | Let us summarise what you have learnt in this video. |

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|  | Assets Required/ Image References |
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|  | Required SFX |
|  | **Navigational I-text** |
|  | Click **Next** to continue. |
|  | **Notes to Tech** |
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