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| **Activity 6.2.3 Resistance** |

Introduction

Resistance to current flow in a circuit can be good or bad. Even the best conductors provide some resistance. Electric power lines travel long distances on very good conductors, but engineers try to improve systems to lose as little energy as possible. Resistance is good, though, if it is protecting an electronic component. If you build a circuit and a component gets very hot, then that is a sign that it should have been better protected with additional resistance. Resistance can also control devices. Increasing resistance on a speaker turns the volume down.

Procedure

1. Complete the questions below as your teacher shows the Resistance presentation.
   1. All resistors \_Limit or Restrict\_\_\_\_ the flow of electrons.
   2. As resistance \_Increases\_\_\_ current Decreases\_\_\_
   3. In electrical circuits there are three factors which affect the amount of resistance. They are: \_\_Thickness\_\_, \_\_Length\_\_\_\_ & \_\_\_Temperature\_\_\_\_\_
   4. Resistance is measured in \_\_Ohms\_\_\_ The abbreviation is \_Ω\_.
   5. \_\_More\_\_ ohms = \_More\_\_\_ resistance = \_Less\_\_\_ current
   6. The basic materials in most fixed resistors are \_Carbon\_\_ and \_Glue\_\_.
   7. Color bands 1 – 2 determine \_1st 2 Digits of resistance\_. Color band 3 is the

\_\_\_Multiplier\_\_. Color band 4 determines \_Tolerance\_\_\_ or\_\_error of resistance\_\_.

* 1. Prefixes are used to eliminate \_\_0s\_\_.
  2. The prefix Kilo means \_1000\_\_. The abbreviation for Kilo is \_k\_.
  3. The prefix Mega means \_\_1000000\_\_. The abbreviation for Mega is ­­­­\_M\_.

1. Complete the Schematic Symbols Chart as you learn about different electronic components and functions.
2. Read the color bands on the supplied resistors, and, using the chart on the following page, calculate the resistance, the converted resistance.
3. Measure the amount of resistance in each resistor using the multimeter.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Band 1 | Band 2 | Band 3 | Calculated Resistance | Converted Resistance | Tolerance Amount  (± 5%) | Accuracy Range | Metered Resistance | Rating |
| 1 | 0 | 10 | 100Ω | 100Ω | ±5Ω | High 105Ω | 99.5Ω | Good |
| Low 95Ω |
| 1 | 0 | 10 | 100Ω | 100Ω | ±5Ω | High 105Ω | 99.5Ω | Good |
| Low 95Ω |
| 1 | 0 | 100 | 1000Ω | 1kΩ | ±50Ω | High 1050Ω | 1kΩ | Perfect |
| Lowv 950Ω |
| 5 | 1 | 100 | 5100Ω | 5.1kΩ | ±255Ω | High 5355Ω | 5.14kΩ | Good |
| Low 4845Ω |
| 1 | 0 | 1000 | 10,000Ω | 10kΩ | ±500Ω | High 10.5kΩ | 9.79Ω | Good |
| Low 9.5kΩ |
| 1 | 0 | 1000 | 10,000Ω | 10kΩ | ±500Ω | High 10.5kΩ | 9.84kΩ | Good |
| Low 9.5kΩ |
| 1 | 0 | 10,000 | 100,000Ω | 100kΩ | ±5kΩ | High 105kΩ | 99.6kΩ | Good |
| Low 95kΩ |

Conclusion

1. Describe a system that would be dangerous if resistance were not a part of the circuit.

Telephone wires so that people don’t get shocked when they try to work on them.

1. Why are fixed resistors’ values indicated by color bands rather than printing the numeric value on their exterior?

So people can tell the difference between fixed resistors.

Use colored pencils to color the bands on the resistors below to identify the appropriate resistance values.

300 Ω

47 Ω

21 KΩ

9.8 KΩ

560 KΩ