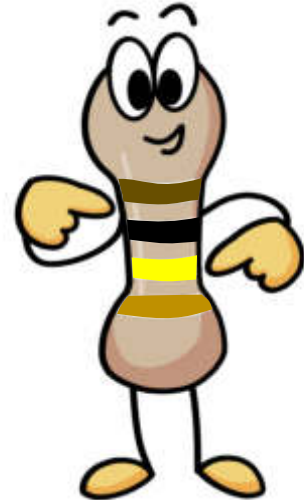
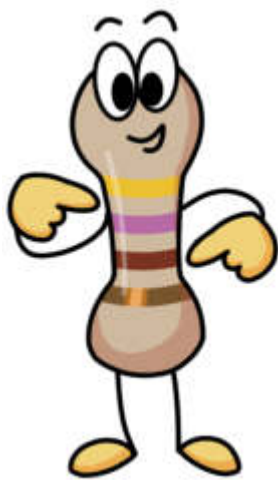


Let's Calculate Resistance!



Using the resistor color chart, figure out the resistance values for each of the resistors pictured above.

| | 1 st Digit | 2 nd Digit | Multiplier | Tolerance |
|--------|--------------------------|--------------------------|-------------------|-----------|
| Black | 0 | 0 | x 1 | |
| Brown | 1 | 1 | x10 | |
| Red | 2 | 2 | x10 ² | |
| Orange | 3 | 3 | x10 ³ | |
| Yellow | 4 | 4 | x10 ⁴ | |
| Green | 5 | 5 | x10 ⁵ | |
| Blue | 6 | 6 | x10 ⁶ | |
| Violet | 7 | 7 | x10 ⁷ | |
| Grey | 8 | 8 | x10 ⁸ | |
| White | 9 | 9 | x10 ⁹ | |
| Gold | | | x10 ⁻¹ | ±5% |
| Silver | | | x10 ⁻² | ±10% |

Here is a great mnemonic to remember the colors and their digit values.

| | |
|-------|----------|
| 0 | Better |
| 1 | Be |
| 2 | Right |
| 3 | Or |
| 4 | Your |
| 5 | Great |
| 6 | Big |
| 7 | Vacation |
| 8 | Goes |
| 9 | Wrong! |
| ± 5% | Go |
| ± 10% | Study! |



Let's Calculate Resistance!

Example #1



1st Band = 1st Digit = **YELLOW** = 4

2nd Band = 2nd Digit = **VIOLET** = 7

3rd Band = Multiplier = **BROWN** = $10^1 = 10$

4th Band = Tolerance = **GOLD** = $\pm 5\%$

The 4 and 7 represents 46 and is multiplied by 10 equals **470Ω**

The 470Ω Resistor at $\pm 5\%$ tolerance makes the actual value between 446.5 Ω and 493.5 Ω

Example #2



1st Band = 1st Digit = **BROWN** = 1

2nd Band = 2nd Digit = **BLACK** = 0

3rd Band = Multiplier = **RED** = $10^2 = 100$

4th Band = Tolerance = **GOLD** = $\pm 5\%$

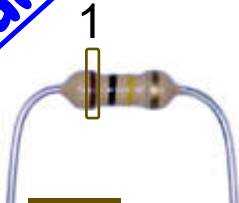
The 1 and 0 represents 10 and is multiplied by 100 equals **1KΩ**

The 1KΩ Resistor at $\pm 5\%$ tolerance makes the actual value between 1050 Ω and 950 Ω

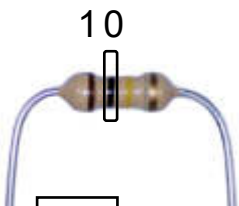


Let's Calculate Resistance!

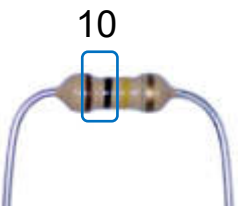
Example #3



Brown means the value is 1

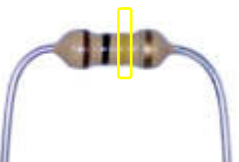


Black means the value is 0



Together their value is 10

$10 \times 10,000$



Yellow means multiple by 10^4 or 10,000.

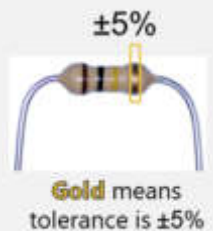
100,000Ω



The value of this resistor is 100,000Ω or 10KΩ



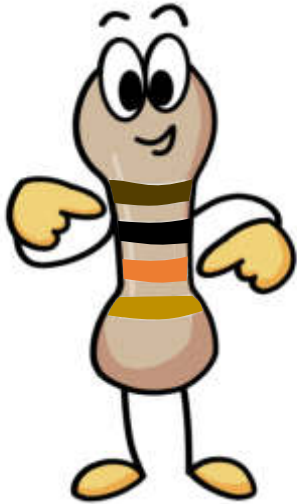
| | 1 st Digit | 2 nd Digit | Multiplier | Tolerance |
|--------|-----------------------|-----------------------|------------------|------------|
| Black | 0 | 0 | $\times 1$ | |
| Brown | 1 | 1 | $\times 10$ | |
| Red | 2 | 2 | $\times 10^2$ | |
| Orange | 3 | 3 | $\times 10^3$ | |
| Yellow | 4 | 4 | $\times 10^4$ | |
| Green | 5 | 5 | $\times 10^5$ | |
| Blue | 6 | 6 | $\times 10^6$ | |
| Violet | 7 | 7 | $\times 10^7$ | |
| Grey | 8 | 8 | $\times 10^8$ | |
| White | 9 | 9 | $\times 10^9$ | |
| Gold | | | $\times 10^{-1}$ | $\pm 5\%$ |
| Silver | | | $\times 10^{-2}$ | $\pm 10\%$ |



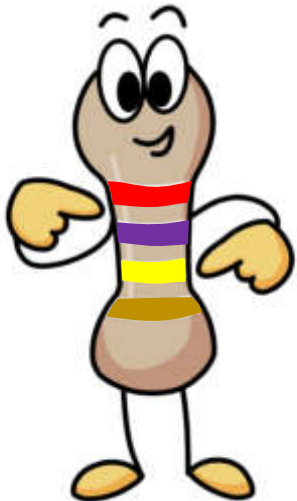
Measured resistance can vary between 9500Ω - 105KΩ



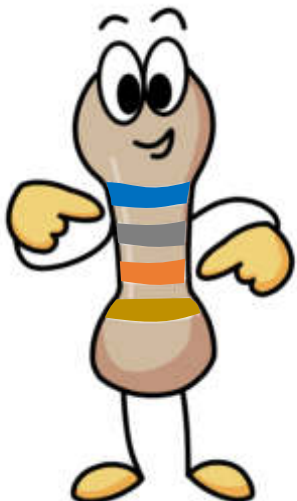
Let's Calculate Resistance!



1st Band = 1st Digit = **BROWN** =
 2nd Band = 2nd Digit = **BLACK** =
 3rd Band = Multiplier = **ORANGE** =
 4th Band = Tolerance = **GOLD** =



1st Band = 1st Digit = **RED** =
 2nd Band = 2nd Digit = **VIOLET** =
 3rd Band = Multiplier = **YELLOW** =
 4th Band = Tolerance = **GOLD** =



1st Band = 1st Digit = **BLUE** =
 2nd Band = 2nd Digit = **GREY** =
 3rd Band = Multiplier = **ORANGE** =
 4th Band = Tolerance = **GOLD** =

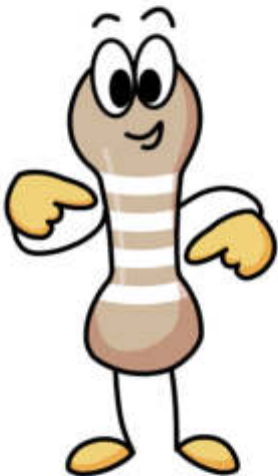


Let's Calculate Resistance!

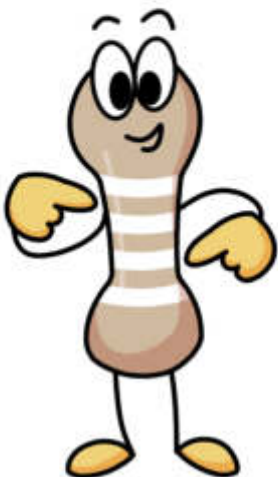
Color in the bands using the resistor color chart to create your own resistors. Exchange drawings with another student in the class and figure out the resistance values for each of the resistors pictured below.



1st Band = 1st Digit =
 2nd Band = 2nd Digit =
 3rd Band = Multiplier =
 4th Band = Tolerance =



1st Band = 1st Digit =
 2nd Band = 2nd Digit =
 3rd Band = Multiplier =
 4th Band = Tolerance =



1st Band = 1st Digit =
 2nd Band = 2nd Digit =
 3rd Band = Multiplier =
 4th Band = Tolerance =

