

# Design and Technology

## The resistor colour code

The general purpose carbon film resistors which are used in schools are marked using the four colour band system. The 4<sup>th</sup> colour band indicates the resistor's tolerance and is normally Gold. This means that the resistor is within 5% tolerance of the stated value.

To calculate the value of a resistor we only have to worry about the first three bands.

### Example 1.

Blue, Grey, Brown, Gold

Looking at the first band, Blue = 6. The second band is Grey which = 8. The third band is the most important. It tells us how many zero's to add. Brown = 0 (1 zero)  
Therefore the value of this resistor is 680 Ohms. This is written as 680R.

Colour	Band 1	Band 2	Band 3
Black	0	0	None
Brown	1	1	0
Red	2	2	00
Orange	3	3	000
Yellow	4	4	0000
Green	5	5	00000
Blue	6	6	000000
Violet	7	7	0000000
Grey	8	8	
White	9	9	

### Exercise 1

Using the colour chart above calculate the value of the following resistors:

1. Brown, Black, Red Gold. \_\_\_\_\_
2. Yellow Violet, Yellow, Gold. \_\_\_\_\_
3. Brown, Black, Green, Gold. \_\_\_\_\_
4. Blue, Grey, Black, Gold. \_\_\_\_\_
5. Orange, White, Orange, Gold. \_\_\_\_\_

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The second part to identifying resistors is to be able to take a numerical resistor value and work out the correct colour bands.

## Example 2

What are the colour bands on a 10K resistor with a 5% tolerance?

Step 1 Convert from kilo Ohms to Ohms  $10K = 10\,000$  Ohms

Step 2 Look at the first digit on the left. This is a 1. The number 1 is represented by the colour brown. This will be the first colour band on the left.

Step 3 Look at the digit after the number 1. This is a 0. The number 0 is represented by the colour black. This will be the second colour band.

Step 4 We are now left with 000 (three zero's). Three zero's is represented by the colour orange. This will be the third colour band.

Step 5 The fourth band is the tolerance which is 5%. This is represented by the colour Gold.

## Exercise 2

What are the colour bands on the following value resistors all of which have a 5% tolerance?

1. 22K \_\_\_\_\_
2. 10R \_\_\_\_\_
3. 10K \_\_\_\_\_
4. 470K \_\_\_\_\_
5. 3K3 \_\_\_\_\_
6. 220K \_\_\_\_\_

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