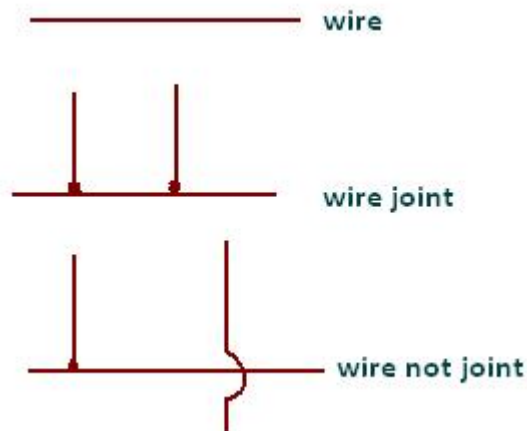


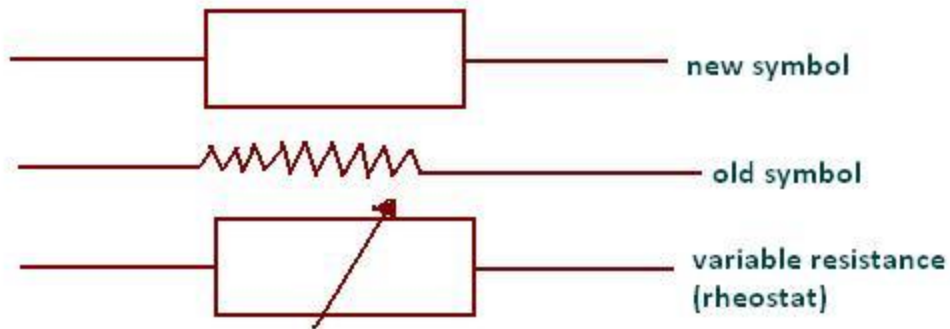
BASIC ELECTRONIC COMPONENTS

"Electronics is that branch of science and technology which makes use of the controlled motion of electrons through different media and vacuum. The ability to control electron flow is usually applied to information handling or device control. Electronics is distinct from electrical science and technology, which deals with the generation, distribution, control and application of electrical power" - from Wikipedia.

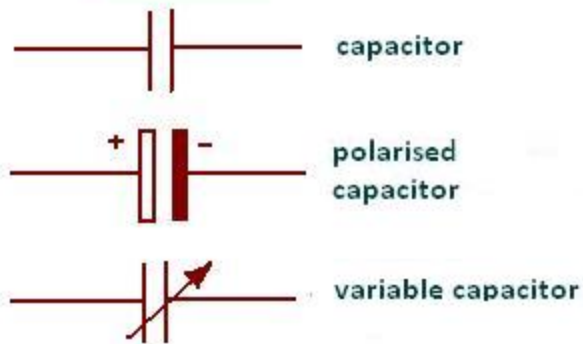
WIRES: Used for connecting **BASIC ELECTRICAL COMPONENTS** mainly resistances, capacitors and inductors.



Resistances



Capacitors



Inductor



Resistance: Its value is measured in ohms (Ω).

COLOUR CODE:

- ♣ Resistances which have large values:- most of them have four bands Example: A resistor has red (2), violet (7), yellow (4 zeros) and gold bands. So its value is $270000 = 270 \text{ k}$. On circuit diagrams this is usually omitted and the value is written 270K.

The Resistor Colour Code	
Colour	Number
Black	0
Brown	1
Red	2
Orange	3
Yellow	4
Green	5
Blue	6
Violet	7
Grey	8
White	9

- ♣ The **first band** gives the **first digit**
- ♣ The **second band** gives the second digit
- ♣ The **third band** indicates the **number of zeros**
- ♣ The **fourth band** is used to determine the **tolerance** (precision) of the resistor, this may be ignored for almost all circuits.
- ♣ **Small Resistances:** The standard colour code cannot show values less than 10 . To show values less than 10 two special colours are used for the **third band**: The first and second bands represent the digits as normal. For example:**red, violet, gold** bands represent $27 \times 0.1 = 2.7$ and **green, blue, silver** bands represent $56 \times 0.01 = 0.56$
 - ♣ **Gold** which means $\times 0.1$ and
 - ♣ **Silver** which means $\times 0.01$.

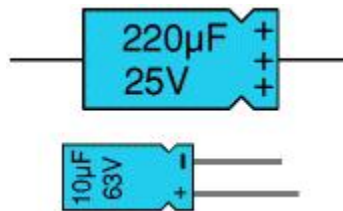
Tolerance of resistors (fourth band of colour code): The tolerance of a resistor is shown by the **fourth band** of the colour code. It is the **precision** of the resistor and it is given as a percentage. For example a 390 resistor with a tolerance of $\pm 10\%$ will have a value within 10% of 390, between $390 - 39 = 351$ and $390 + 39 = 429$ (39 is 10% of 390). A special colour code is used for the fourth band: **silver $\pm 10\%$, gold $\pm 5\%$, red $\pm 2\%$, brown $\pm 1\%$** . If no fourth band is shown the tolerance is by default $\pm 20\%$. (Tolerance may be ignored for almost all circuits because precise resistor values are rarely required.)

CAPACITORS



Capacitors store electric charge. They are used with resistors in 'timing' circuits because it takes time for a capacitor to fill with charge. They are used to smooth varying DC supplies by acting as a reservoir of charge. They are also used in filter circuits because capacitors easily pass AC (changing) signals but they block DC (constant) signals.

- ♣ **Polarized Capacitors:** They must be connected the correct way round, at least one of their leads will be marked '+' or '-'. They are not damaged by heat when soldering.



- ♣ **Un-polarized Capacitors:** No such precaution is needed. They have high voltage ratings of at least 50V, usually 250V.
- ♣ **Variable Capacitors:** They are mostly used in radio tuning circuits and they are sometimes called '**tuning capacitors**'. They have very small capacitance values, typically between 100pF and 500pF (100pF = 0.0001µF).

Source : <http://www.botskool.com/tutorials/electronics/general-electronics/basic-electronic-components>