



# **SAC CUTE PROJECT**

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Microfactory**

# LESSON ONE:

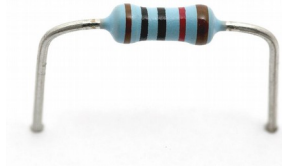
## INTRODUCTION TO BASIC ELECTRONICS

### Introduction to Basic Electronics Components

The following are common Basic Electronic components you can find in a circuit.

- Resistor
- Capacitors
- Light Emitting Diode (LED)
- Inductors
- Integrated circuits

## RESISTOR



**Student** : What is a resistor?

**Tutor** : It's a component that resists the flow of current

**Student** : Hmm... I don't get it. What does it do to my circuit

**Tutor** : Well, it doesn't actually *do* anything actively.

The resistor is a passive device and doesn't do anything actively to your circuit. By using resistors, you can design your circuit to have the currents and voltages that you want to have in your circuit. The resistor gives the designer control over his circuit! The Resistor is represented in the circuit with the diagram below.



Following the Ohms law principle, the relationship between Voltage, Current and Resistance is given below.

$V = IR$  (Current X Resistance)

Resistance = Voltage / Current

Current = Voltage / Resistance

The more you increase the resistance, the lesser the current flow in the circuit.

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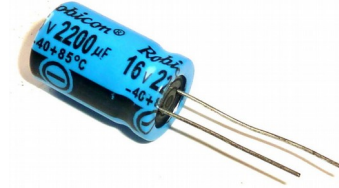
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## CAPACITOR



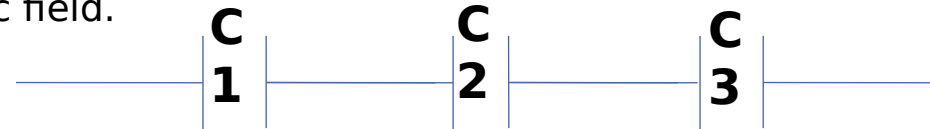
**Student** : What is a capacitor?

**Tutor** : It's a component that filters unwanted current in a circuit. A capacitor is also used to store charges in a circuit. It is used in rechargeable devices.

We have different types of capacitor

- Polarized capacitor
- Non-polarized capacitor

A capacitor works by storing energy electrostatically in an electric field.



To calculate the total Capacitance in a circuit.

The arrangement can either be in series or in parallel

As shown above, in series, we have  $C = C1 + C2 + C3$

If it is in Parallel,  $1/C = 1/C1 + 1/C2 + 1/C3$

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## INDUCTOR



**Student** : What is An Inductor?

**Tutor** : An Inductor is also used in the filtration process in a circuit.

An inductor is just a coil of wire around some kind of core. The core could be just air or it could be a magnet

The inductor is similar to the opposite of a capacitor.

In series it will resist alternating currents (AC) and let direct currents (DC) flow free.

It's like a bully component. It will mess with the alternating currents (AC). But the direct current (DC) he will let be.

The inductor is represented by the below



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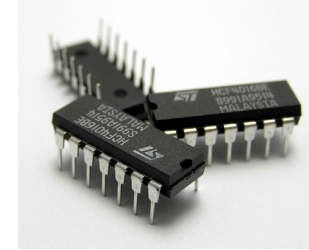
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## INTEGRATED CIRCUIT



**Student** : What is An Integrated Circuit?

**Tutor** : An Integrated Circuit is just an electronic circuit that has been shrunk to fit inside a chip.

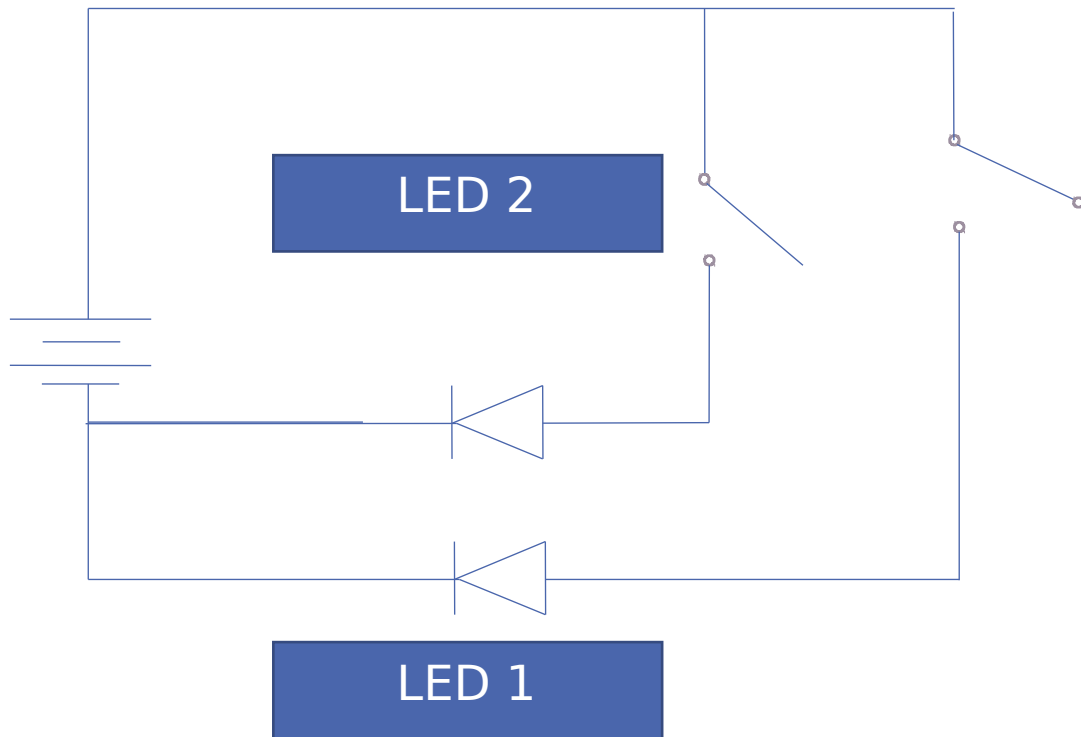
An Integrated Circuit (IC) consists of many basic electronic components.

It could be an amplifier, it could be a microprocessor, it could be a USB to serial converter... It could be anything!

**Student** : What does an Integrated Circuit do to your system.

**Tutor** : It can be an amplifier, a radio transmitter, a microcontroller or any other circuit you can think of.

## LESSON 2: PARALLEL SYSTEM OF CONNECTION OF LED



### COMPONENTS NEEDED

- ✓ Battery
- ✓ Light Emmitting Diode
- ✓ Switch
- ✓ Conductive adhesive Tape



## LESSON 2: PARALLEL SYSTEM OF CONNECTION OF LED



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**OTHER LESSONS STILL IN PROGRESS**





# THANK YOU

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<https://greenlab-microfactory.org>