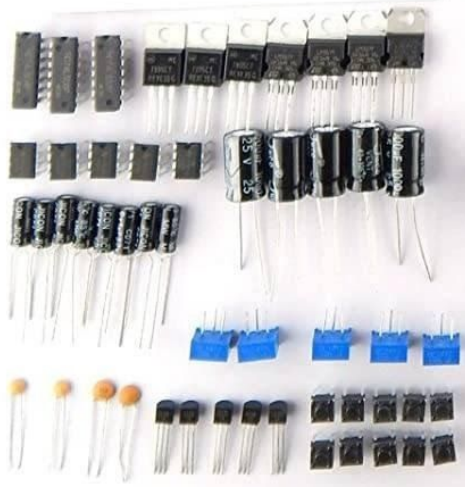
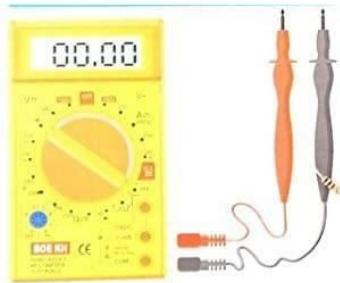
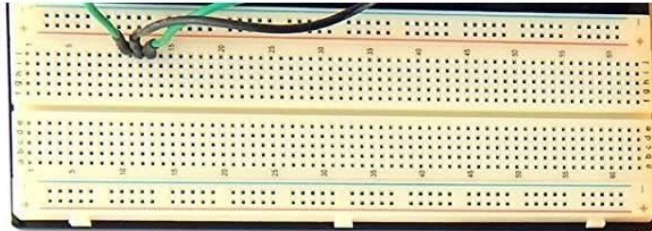


# STARTER KIT FOR ELECTRONICS

**BASICS**  
OF  
**ELECTRONICS**



## 1. Course Overview

**Age group:** 8+ Years

**Course duration:** 24 Hours

### **Main Concepts:**



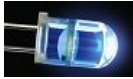

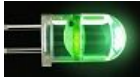


















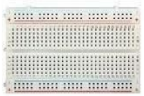

- Basics of electronics.
- Creating circuits using basic elements like resistor, capacitor and so on.
- Basics of Tinkercad development tool
- Advance electronics
- Designing advance circuits using Tinkercad tool

## 2. Starter Kit Details

The Starter Kit for Basic Electronics is an excellent kit for those who want to get started and learn with fun about electronics. This kit includes all the basic elements for one to gain enough knowledge about what is electronics and what all it is about. This includes LED'S, Resistors, Capacitors, Diode, Transistors, Buzzer, Mini Bulb, Slide switch, SPST Switch, Photo resistor, Dc Motor, Dc Gear motor, Batteries(1.5V, 3V, 9V), Breadboard, Multimeter and Jumper wires( M-M, M-F, F-F) .

We have perfect technology support, which include 16 teaching lessons, along with challenging activities involved for every topic and component. With this kit you can DIY some little things you like, which can create your imagination. This kit is suitable for gaining strong knowledge on the basics, such as those who have a weak foundation about electronics. It also can be used in the school's interest training courses to allow more students to learn about the Electronics as it is the science on which today's large part of the world around us is based.

## List of components included in kit

S. no	Name	Qty	Image	S. no	Name	Qty	Image
1	Yellow LED	10		14	DC Motor	2	
2	Blue LED	10		15	Diode 4007	5	
3	Green LED	10		16	DC Gear Motor	2	
4	Red LED	10		17	Photo resistor	2	
5	Bulb	2		18	Buzzer	2	
6	1.5v AA Battery	2		19	Transistor	5	
7	3v CMOS Battery	2		20	2 cell AA battery Case	1	
8	9v Battery	2		21	CMOS battery case	1	
9	Resistor Box	1		22	9v battery cap	1	
10	Capacitors	10		23	Jumper Wires M-M	20	
11	Slide Switch	2		24	Jumper Wires M-F	20	
12	SPST Switch	2		25	Jumper Wires F-F	20	
13	Bread Board	1		26	Multimeter	1	

### 3. Course Structure

**Number of sessions:** 16

**Duration:** 24 hours

Session	Session Type	Session Topic	Description
1	Theory	Introduction to Basic Electronics	Students will be taught about semiconductors and its uses
	Assessment	Activity Session	Students will make a simple circuit using LED and a battery
2	Theory	Resistors:Series and Parallel	Students will be taught about colour codes and calculating resistance values
	Assessment	Activity Session	Students will make a circuit using resistor and a 9v battery
3	Theory	Introduction to Tinkercad software	Students will be taught about the Basics of Tinkercad software like its purpose, installation and account creation
	Assessment	Activity Session	Students will make a basic circuit of glowing Led using Tinkercad
4	Theory	Capacitor: Charging and Discharging nature	Students will be taught about capacitance And its purpose
	Assessment	Activity Session	Students will do an activity to charge and discharge two LEDs using a slide switch in Tinkercad
5	Theory	Potentiometers: Variable Resistor	Students will be taught about different values of resistance
	Assessment	Activity Session	Student will do an activity on increasing and decreasing light of a bulb in Tinkercad
6	Theory	Switches and its Types	Students will be taught about different types of switches like SPST, SPDT, DPST, DPDT
	Assessment	Activity Session	Student will do an activity using different switches with multiple outputs in Tinkercad
7	Theory	Power Sources	Students will be taught about different power sources and relation between voltage, current and resistance

	Assessment	Activity Session	Students will do an activity to maintain power balance in the circuit in Tinkercad
8	Theory	Breadboard	Students will be taught about types of connections in the breadboard
	Assessment	Activity Session	Students will make a simple circuit to test series and parallel connections in the breadboard in Tinkercad
9	Theory	DC Motors	Students will be taught about internal structure and mechanism of a DC motor
	Assessment	Activity Session	Students will do an activity to run a DC motor in Tinkercad
10	Theory	Diodes	Students will be taught about the concept on diodes
	Assessment	Activity Session	Students will do activity using diode for forward and reverse bias of current to glow LEDs in Tinkercad
11	Theory	Multimeter	Students will be taught about working tools in multimeter
	Assessment	Activity Session	Students will test all functions of electronic components and note their value in Tinkercad
12	Theory	Series and parallel connections using Resistor	Students will be taught about uses and design of series and parallel resistance
	Assessment	Activity Session	Students will make their own series and parallel connections on breadboard in Tinkercad
13	Theory	Capacitance and Diode	Students will be taught about combination of Capacitor and a diode to prevent high voltage
	Assessment	Activity Session	Students will make a mini discharging battery in Tinkercad
14	Theory	Transistor and Buzzers	Students will be taught about different working of Transistor like BJT, IGBT, MOSFET and different types of buzzers
	Assessment	Activity Session	Students will make an amplifier to control sound using buzzers in Tinkercad

15	Theory	Photoresistor	Students will be taught about working principle of Photo resistor.
	Assessment	Activity Session	Students will use Photoresistor as a sensor to glow LED in Tinkercad
16	Theory	Gear motor	Students will be taught about working principle of hobby gear motor
	Assessment	Activity Session	Student will perform an activity to make their own model using different electronic components in Tinkercad

#### **4. FAQ'S**

##### **Course FAQ'S:**

##### **1. Why Electronics?**

Electronics is a science on which a large part of the world around us is based. Every day we have contact with new technology. We are always with our smartphones and computers. Devices become cheaper, smaller and more efficient. Unfortunately, instead of repairing the damaged equipment, we replace it with a new one, because miniaturization does not make it easier to repair it. We can start our adventure with electronics from our courses, which deal with the basics of electronics and programming.

##### **2. What are the outcomes of learning Electronics?**

Electronics develops the skills of logical and abstract thinking. This science is to a large extent based on the laws of physics and mathematics, whereas their application in practice requires creative thinking. As with any technical field, playing with electronics requires diligence and accuracy in action. Therefore, when you create new projects, you develop these qualities.

## **Technical FAQ'S:**

### **1. What does a resistor and a capacitor do?**

A RESISTOR is an electrical component, which has a certain amount of resistance. Resistance is the measure of the opposition to electric current. The more resistance a resistor has, the lesser current will flow through it.

Electric current is the flow of electric charges, much like the flow of water. As water can be stored, charges can also be stored. The electrical component that stores the electric charges is called CAPACITOR.

### **2. What is the purpose of using a switch in electronic circuits?**

A switch is a component which controls the open-ness or closed-ness of an electric circuit. They allow control over current flow in a circuit (without having to actually get in there and manually cut or splice the wires). A switch can only exist in one of two states: open or closed.

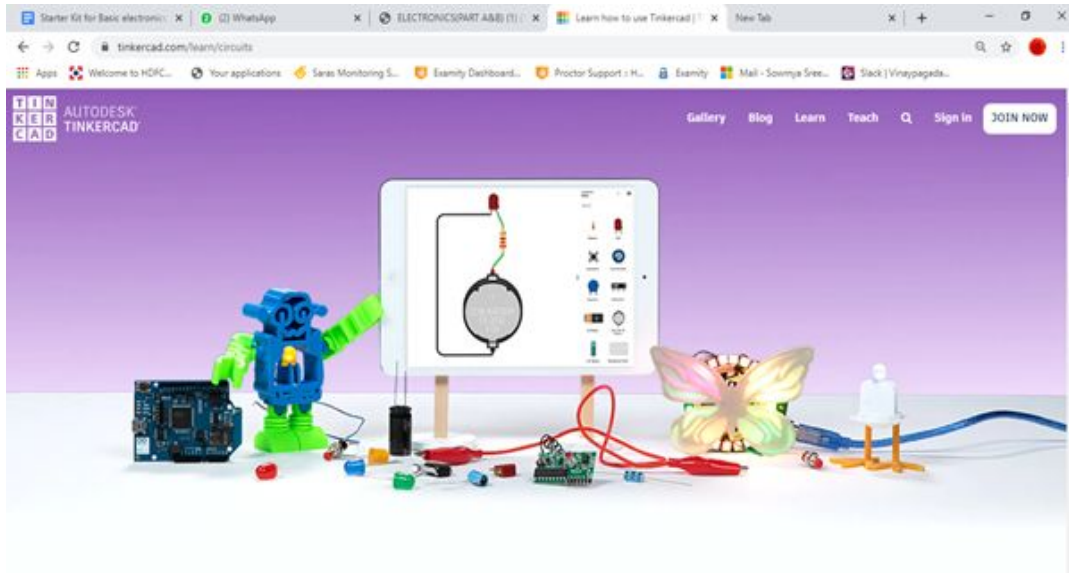
### **3. What is the significance of a diode?**

A diode is a semiconductor device that essentially acts as a one-way switch for current. It allows current to flow easily in one direction, but severely restricts current from flowing in the opposite direction.

### **4. Software Tools interacted?**

Tinkercad is an open source online development tool for making 3D models and building Electronic circuits. The development environment is easier to use with lots of fun. This environment has components to construct a variety of electronic circuits, where students can assemble and test inside the development environment.





Tinkercad is an online development and simulation tool where students can easily “Design”, “Program” and “Simulate”.

