

Fundamentals of Electronics and Electrical

Introduction to -

- Types of electrical component
- Steps of electrical circuit building
- Circuit designing



What are the 5 components of a simple circuit?

What are the basics electrical components?

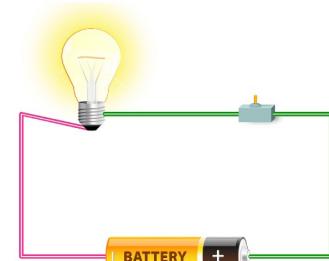
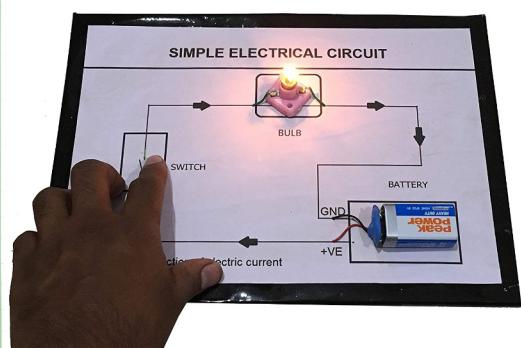
What are the basics of electronics?

The following common components are used in most circuit boards:

1. Resistors.
2. Transistors.
3. Capacitors.
4. Inductors.
5. Diodes.

Lesson Aims:

1. Differentiate the concepts of voltage, resistance, and current
2. Understand the VOLT OHM Meter/ Digital Multi Meter and how to use it safely
3. Use Ohm's Law to calculate voltage, current, and resistance
4. Applying resistors in various configurations



Watch the circuit animation at home. Think about the circuit we read in class. Compare and contrast the two types of circuits using the template given by the teacher.

Recap About Circuits

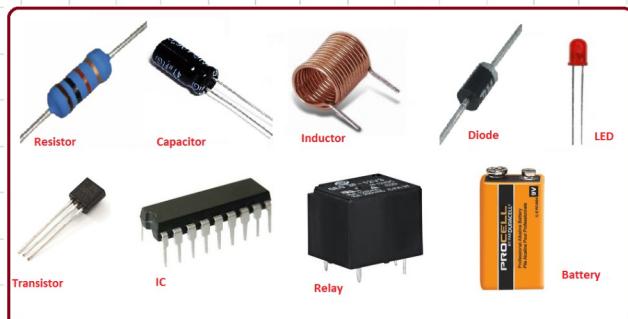
The circuit is a combination of individual electronic components such as resistors, transistors, capacitors, inductors, and many of which are connected by wires through which current flows.



A basic electric circuit is made of four main electric components:

A power source can be a direct current (DC) or alternating current (AC). A battery is a DC power source whereas electricity at home is an AC power source.

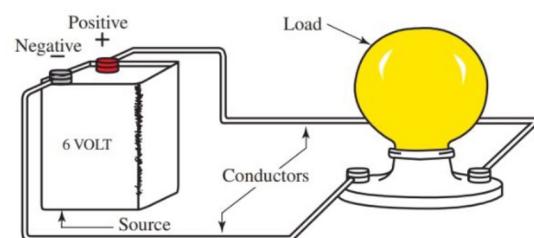
A load that converts the electric potential energy to another form. Bulbs are electric loads that convert electric potential energy to light and heat energies.



Resistors, capacitors, and inductors are other examples of electric loads.

A switch that opens and closes the electric circuit. When the switch closes, electric current flows in the circuit providing electric potential energy to its components.

Electric conductors (wires) whose internal resistance is very small or negligible. Conductors connect the load to the power source through the switch.



Types of Basic Components

The basic components are energy source, conductors, switch and load.

- **Energy source:** There are two principal types of sources, namely voltage source, and current source. Sources can be either independent or dependent upon some other quantities.

- **Conductors:** Conductors are the materials or substances which allow electricity to flow through them. They conduct electricity because they allow electrons to flow easily inside them from atom to atom. Also, conductors allow the transmission of heat or light from one source to another.

- **Switch:** Switches allow you to connect dozens of devices. Switches keep traffic between two devices from getting in the way of your other devices on the same network. Switches allow you to control who has access to various parts of the network.

- **Load:** An electrical load is an electrical component or portion of a circuit that consumes (active) electric power, such as electrical appliances and lights inside the home. The term may also refer to the power consumed by a circuit.





Activity

Electronic Components

The electronics industry has been skyrocketing over the last few years as more and more people are using electrical appliances for their everyday needs. It is so important to know the basics of how these components work, as they are a necessity in modern society. Here is a step-by-step guide to help you understand what electronic components are, what they do, and how they function.

Step 1: Cut a Small Portion of the Wire into Half.

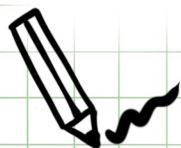
Step 2: Cut the Rubber of the Wire.

Step 3: Place the Battery in Its Case.

Step 4: Twist the Copper Wire.

Step 5: Connect the LED to the Wire.

Step 6: Connect the Negative Wire to the Negative Side and the Positive One to the Positive Side.





Activity

Making Circuit Using Breadboard



- Step 1: Insert the LED into the Breadboard
- Step 2: Insert the Resistor into the Breadboard
- Step 3: Insert the Wire Link into the Breadboard
- Step 4: Insert the Battery Clip into the Breadboard
- Step 5: Plug the Battery into the Battery Clip

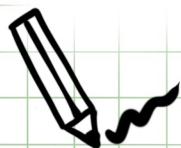
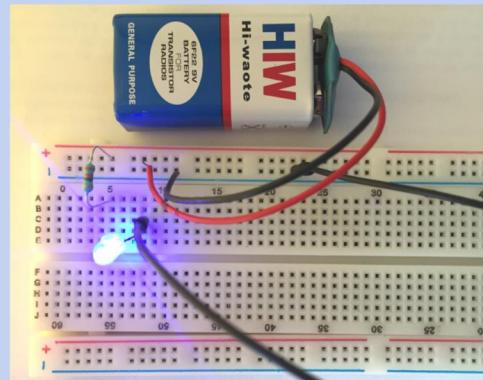
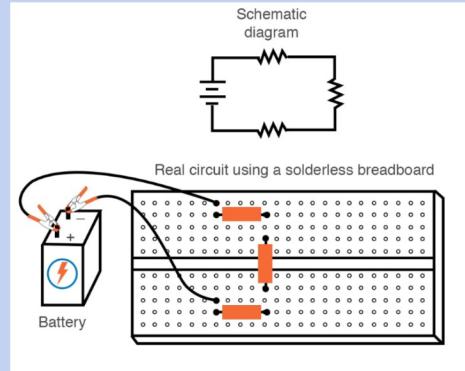
How does electricity flow through a breadboard?

How do you make a circuit step by step?

What are the 3 items needed to make a circuit?

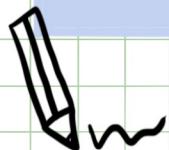
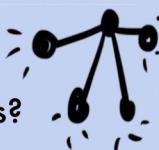
What materials do you need to make a simple circuit?

How do you make a homemade circuit with an electric switch?



Reflection

- 1) What circuits are typically used in homes?
- 2) What are the different sources to get energy?
- 3) What elements and compounds are found in your home?



For more information
scan the qr code

