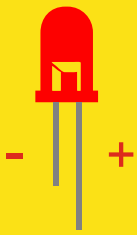
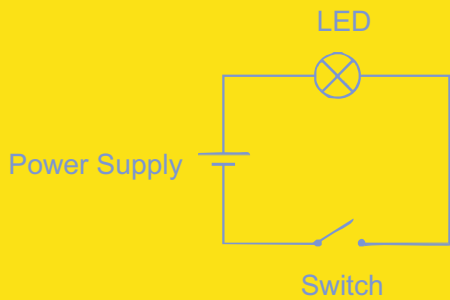


Activity 1 : Simple Circuit

An electrical circuit is a path or route through which electrical current flows. The path is made of electrically conductive material.



Light-emitting diode (LED) is a semiconductor light source that emits light when current flows through it.

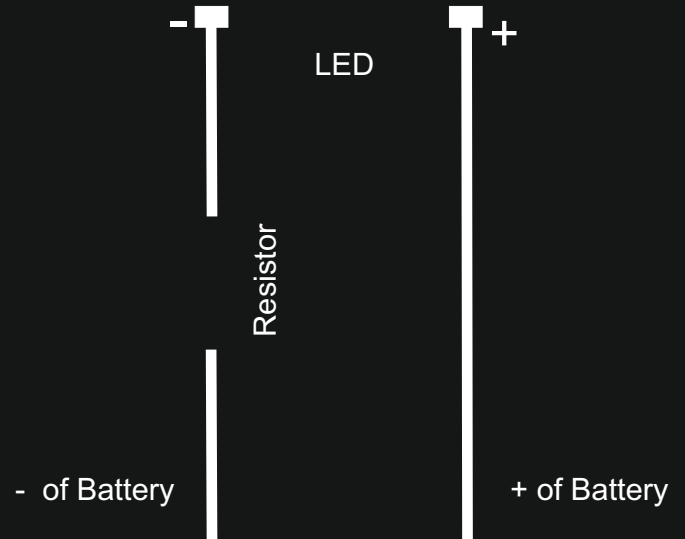
Longer leg of LED is positive while the shorter is negative.

www.boxofscience.com



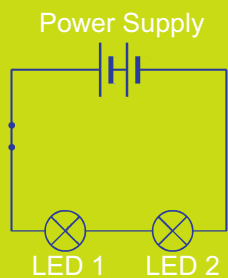
Make your 1st Circuit

Required Components: 1 LED, 1 Resistor 330 ohm (Orange, Orange Brown) Conductive tape, 9 Volt Battery unit.



Activity 3 : Series Circuit

An electrical circuit is a path or route through which electrical current flows. The path is made of electrically conductive material.



LED 1 and 2 are in series combination

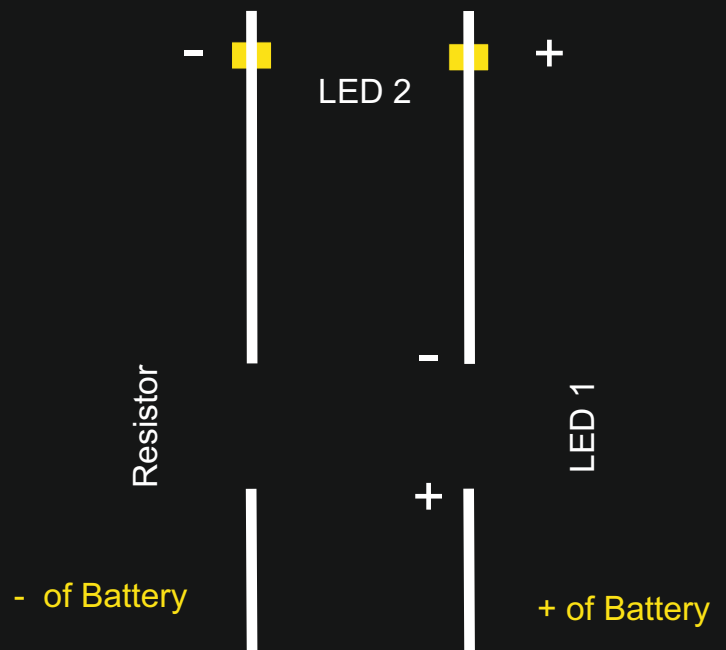
The basic idea of a "series" connection is that components are connected end-to-end in a line to form a single path through which current can flow.

Required Components: 2 LED's, 1 Resistor 330 ohm (Orange, Orange, Brown), Conductive tape, 9 Volt Battery unit

www.boxofscience.com

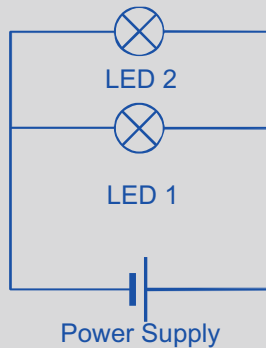


Series Combination



Activity 4 : Parallel Connection Circuit

An electrical circuit is a path or route through which electrical current flows. The path is made of electrically conductive material.



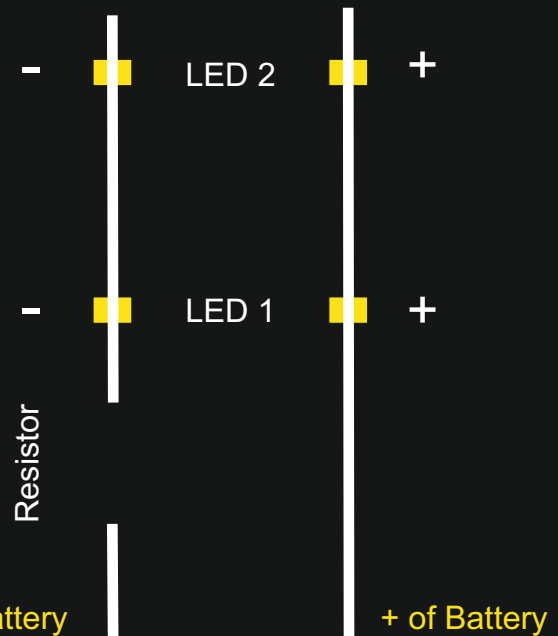
In a parallel circuit, each LED is connected one after the other, they are all connected separately, in their circuits like in the diagram above.

Required Components: 2 LED's, 1 Resistor 330 ohm (Orange, Orange, Brown), Conductive tape, 9 Volt Battery unit

www.boxofscience.com



Parallel Combination



Activity 6: Light Sensor Circuit

In this activity we will experiment with a type of resistor called as LDR, Light Dependent Resistor.

What is an LDR?

LDR is an input transducer or sensor which converts brightness (light) to resistance. Its resistance decreases as the brightness of light increases.

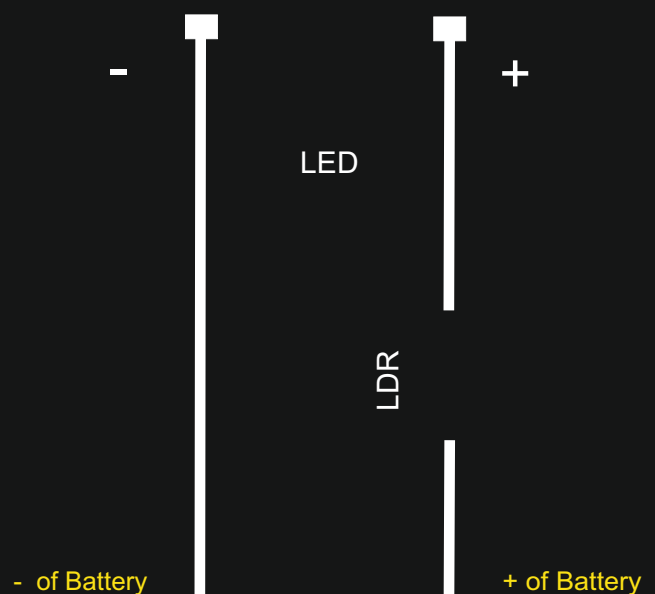


Required Components: 1 LED (White), LDR, Conductive tape, 9 Volt Battery unit.

www.boxofscience.com

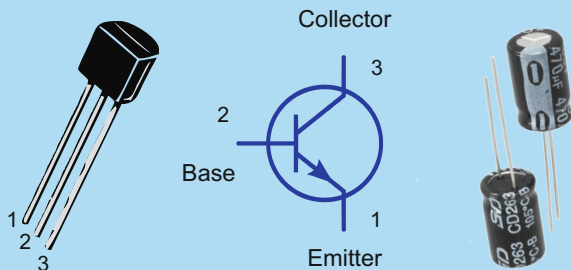


Using LDR



Activity 5: Blinking LED

In this activity we will study how capacitor in combination with resistor works. A capacitor is passive two-terminal electronic component that stores electrical energy. The effect of a capacitor is known as capacitance.



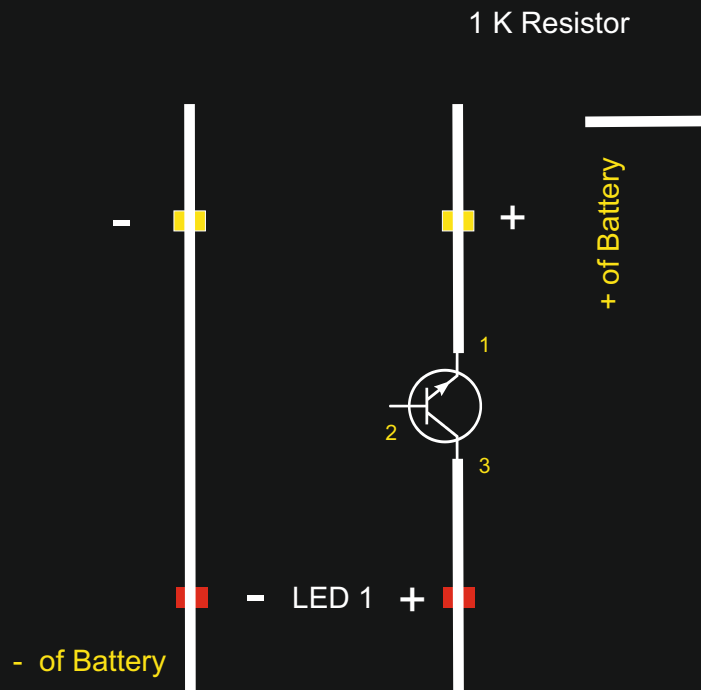
We will use transistor 2222a for this activity. Pin diagram is as above.

Required Components: 1 Red LED, 2222a transistor, 1 Resistor of 1 k ohm (Brown, Black, Red), 1000 µF Capacitor, Conductive tape, 9 Volt Battery unit,

www.boxofscience.com



Blinking LED Circuit



Activity 7: Dark Sensor Circuit

In this activity we will be making a dark sensor. Its an automatic dark sensor.

What is a transistor?

Transistor is a device used to amplify or switch electronic signals.

It is composed of semiconductor material usually with at least three terminals for connection to an external circuit.

Pin Diagram for BC 547:

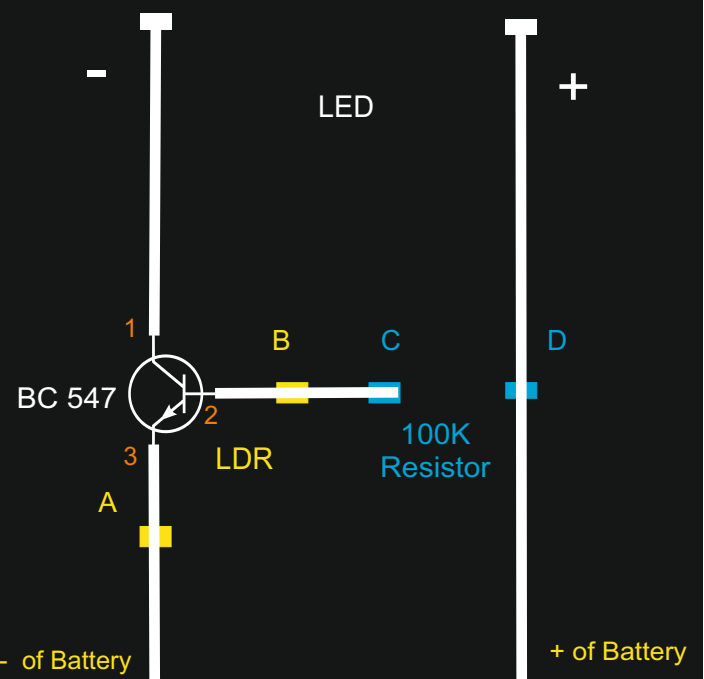


Required Components: 1 LED (White), 1 Resistor 100 k ohm (Brown, Black, Yellow), BC 547 Transistor, LDR, Conductive tape, 9 Volt Battery unit.

www.boxofscience.com



Automatic Dark Sensor

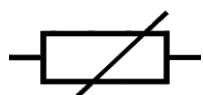


Activity 10: Fire Alarm Circuit

This is an interesting project which will help in understanding applications and design of fire sensors. The activity is based on using 'Thermistor' as a sensor.

What is a Thermistor?

It is a type of resistor whose electrical resistance varies with changes in temperature. The working principle of a thermistor is that its resistance is dependent on its temperature.



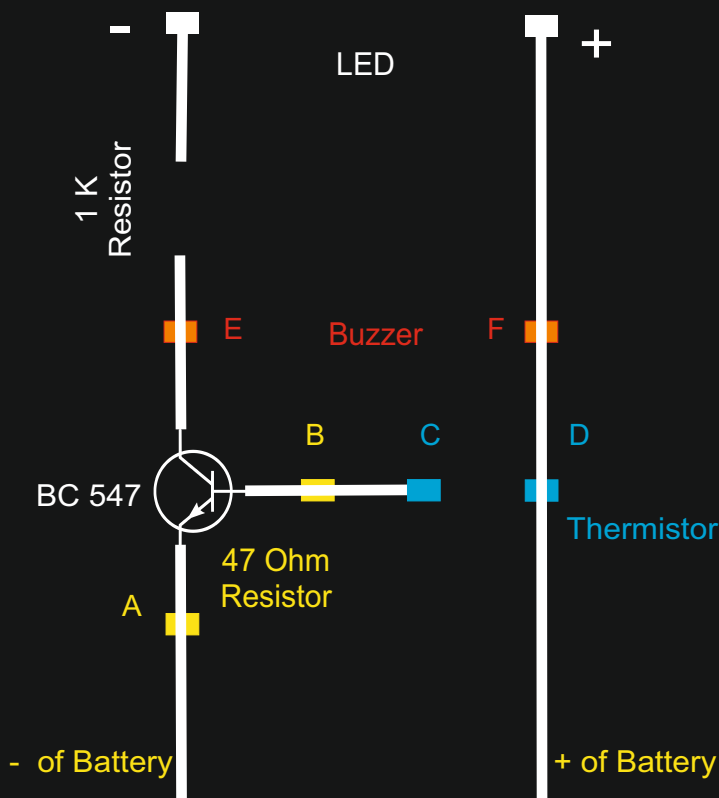
Thermistor Symbol

Required Components: 1 LED, 1 Resistor 47 ohm (Yellow, Violet, Black), 1 Resistor 1 K ohm (Brown, Black, Red), BC 547 Transistor, Buzzer, Red LED, Thermistor (10 K), 9 V battery, Conductive tape.

www.boxofscience.com



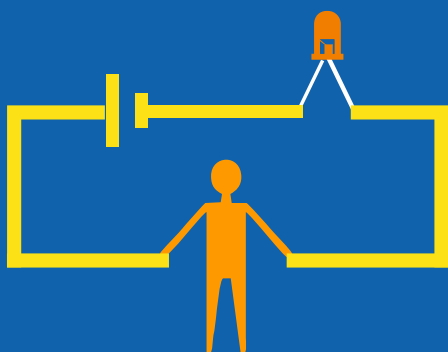
Fire Alarm



Activity 8: Touch Sensor Circuit

Human body is a good conductor of electricity. It happens due to saline and conductive fluids in our body. Any contact with direct source of high voltage and high current must be avoided. Human cells and organs might damage due to exposure of high current.

In this activity we will understand above facts through actual experimentation. However, we will be using minute levels of current and voltage.



www.boxofscience.com



Touch Sensor

Required Components: 1 LED, 1 Transistor (547), Conductive tape, 3 Volt Battery unit, 2 batteries (1.5 Volt)

