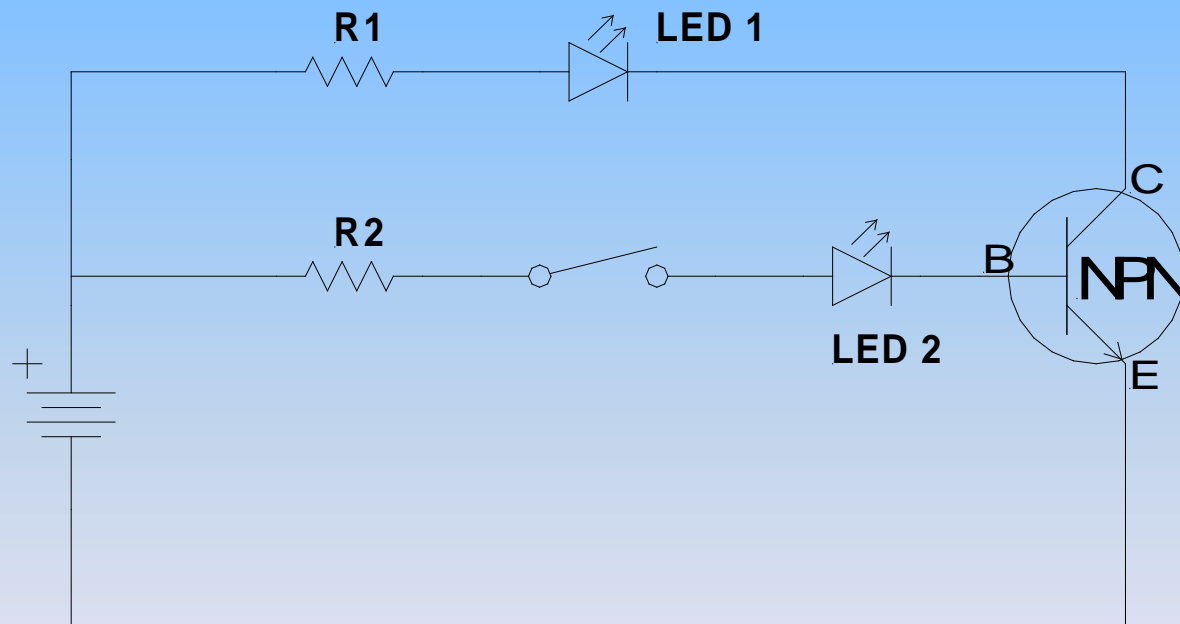


Electronic Components

Pictures, Descriptions, and Symbols

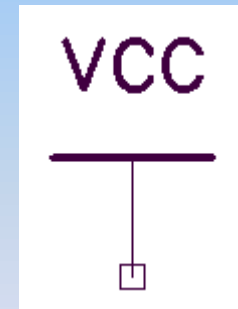
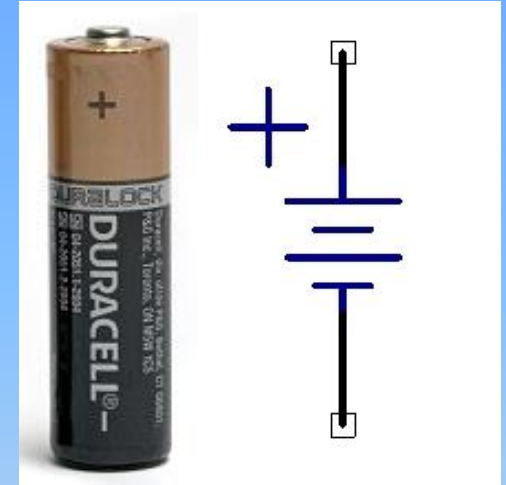
Electronics involves the use of many components this presentation will introduce some basic components, their uses/functions and their schematic symbols.

Below is a 'Schematic Circuit Diagram'. By using symbols to represent components, circuits can be quickly and easily drawn and interpreted. Pay close attention to the component symbols as you work through this presentation as understanding these will be important to your being able to breadboard circuits which will be your next assignment. Also note that the lines that connect the symbols together represent the 'wires' that the electrons will flow through as they travel between components.



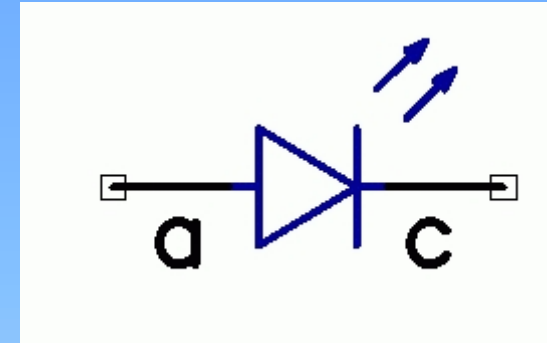
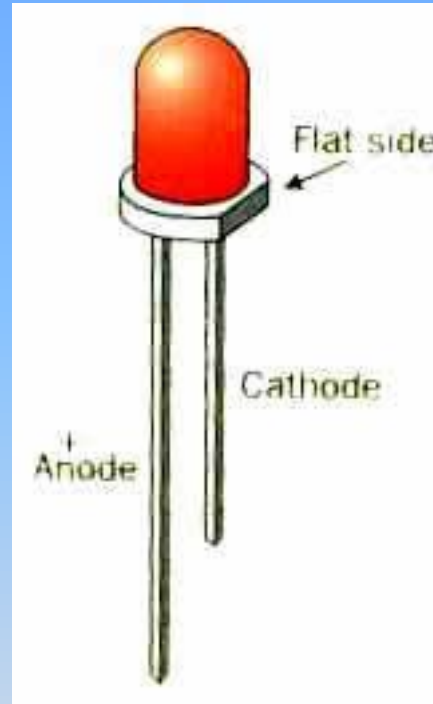
Battery

- A portable power source (voltage). Has a positive and negative.
- Electronics works on Direct Current (DC) where electrons flow from negative to positive.
- Note the schematic symbols and how they will be used to identify positive and negative connections.
- 'GND' stands for 'ground' and is negative. 'VCC' stands for 'Voltage Common Collector' and is positive.



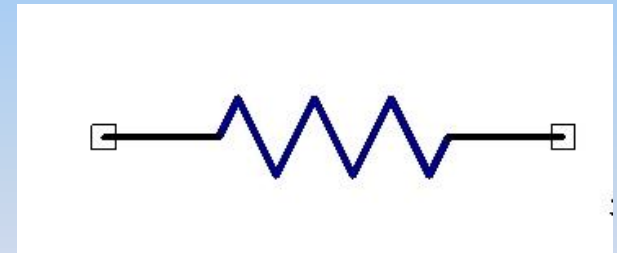
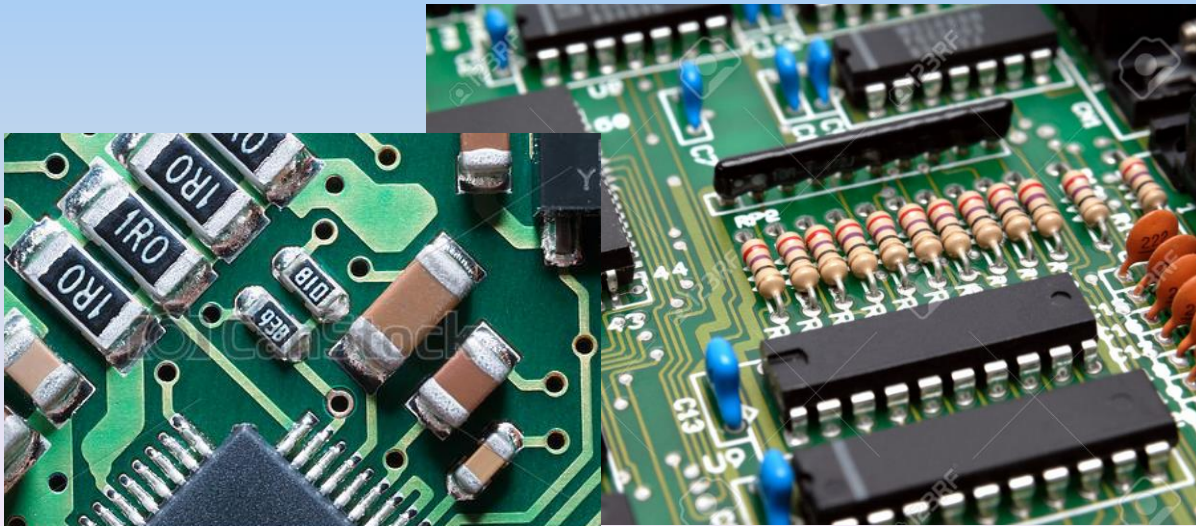
LED (Light Emitting Diode)

- Gives off light when electricity flows through it.
- Has an anode (positive) and cathode (negative) side – polarity sensitive
- The flat line in the symbol indicates which side is hooked to negative



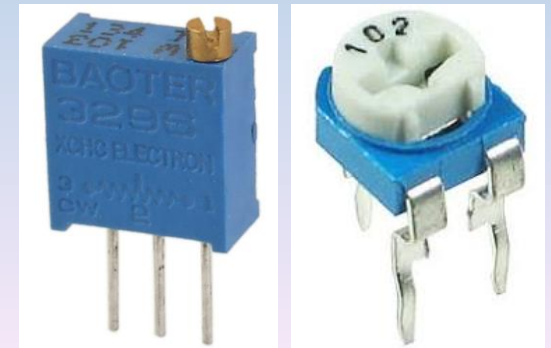
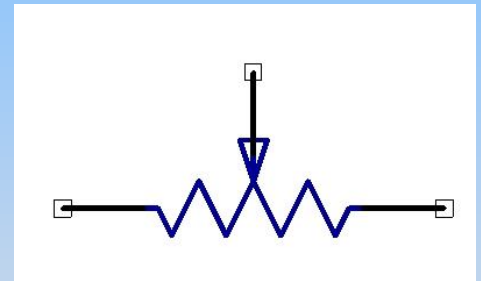
Resistors

- Resistors are used to control the amount of current flowing through a circuit
- As voltage drops across a resistor they can also be used for voltage control
- Their physical appearance can vary greatly.
- The schematic symbol for a fixed resistance resistor is shown on the lower right



Potentiometer

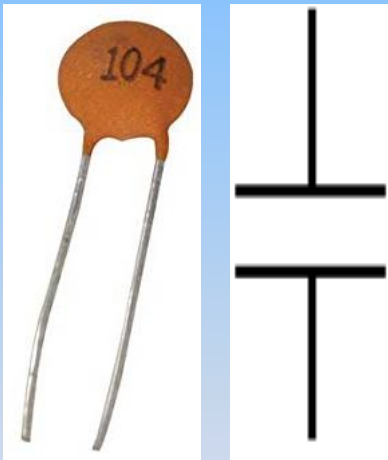
- A potentiometer is a variable resistor. As you turn the knob, the resistance changes from 0 ohms (no resistance) to its maximum value (lots of resistance)
- The symbol depicts how the resistance change is achieved. The 'centre tap' (arrow) is adjusted along the resistance, left and right, by turning the knob changing the amount of resistance the electrons have to move through.



Capacitors

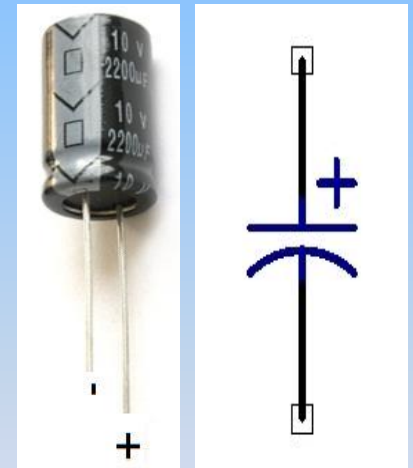
A device used to store energy much like a battery. Can be charged and discharged over and over. There are different types;

Disc Capacitors
(non-polarized)



- The larger the value of the capacitor, the more electricity it can store
- Base unit capacity is measured in is the Farad.
- The capacitor on the right has a capacity of 2200 uf, or micro-farad.

Electrolytic Capacitor
(polarized)

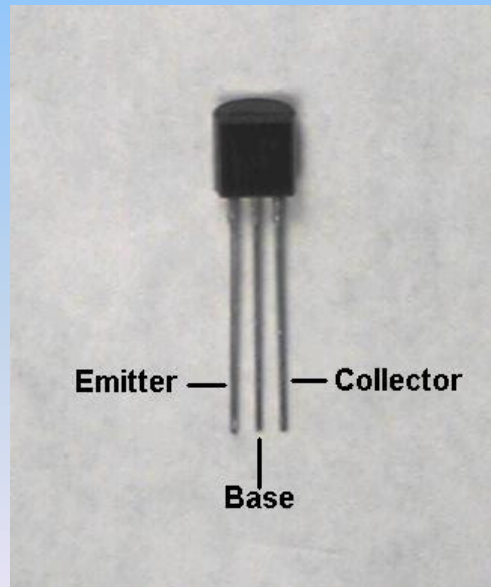
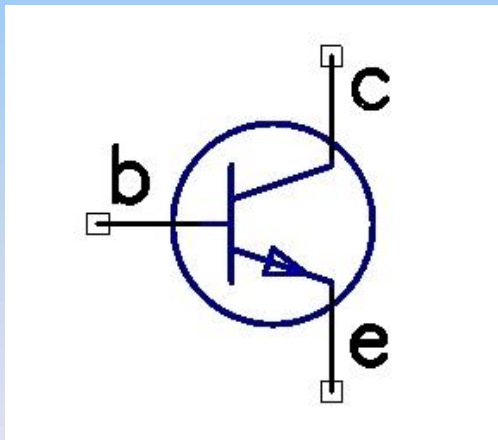


Transistor

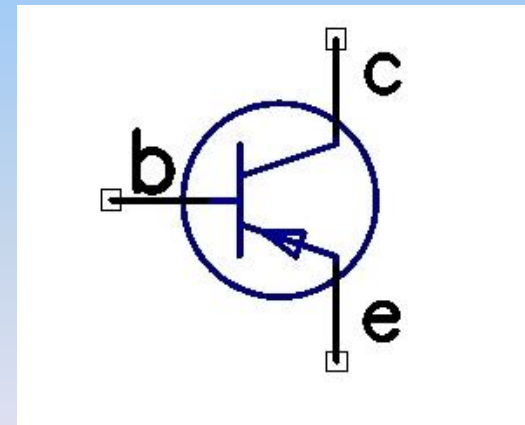
A transistor can work as a current amplifier, or switch. It uses a small 'base' current to control, or switch on, a larger emitter-collector current.

There are two main categories, 'NPN' or 'PNP', depending on whether the triggering voltage (base voltage) is positive or negative.

2n3904 NPN Transistor

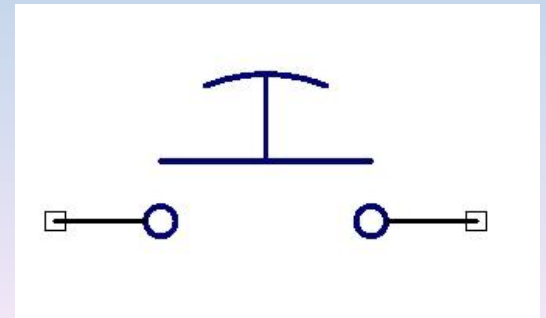
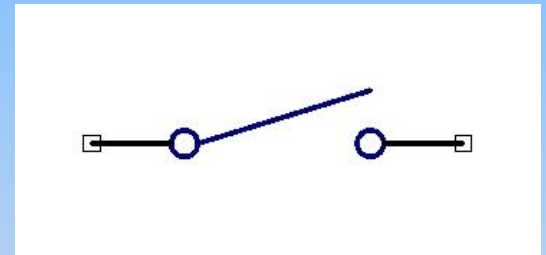


2n3906 PNP Transistor



Switches

Devices that are used to turn ON and OFF the flow of electricity to a circuit.



Integrated Circuits

- Integrated circuits, or ICs, are miniaturized circuits designed for dedicated purposes. They come in various 'packages', with the Dual Inline Package (DIP) being very common (shown)
- To figure out which pins are which, you need to remember that the text ALWAYS faces so you can read it, and the notch, dot, or line is on your left.
- Pin #1 is then on the bottom left corner (all pins are numbered for purposes of identifying during circuit design/construction). Data Sheets are consulted for details of these.

