Week_7(09/26/2023)

Trinity Robotics

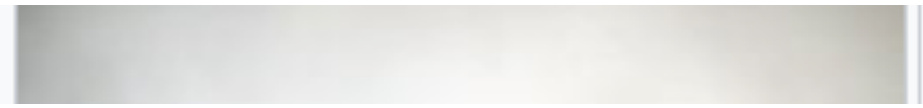
Last week we learned more about circuits
through a bread board demonstration,
Also about DC Motors and how they work in
magnetic fields.

This week we will continue our knowledge of circuits.

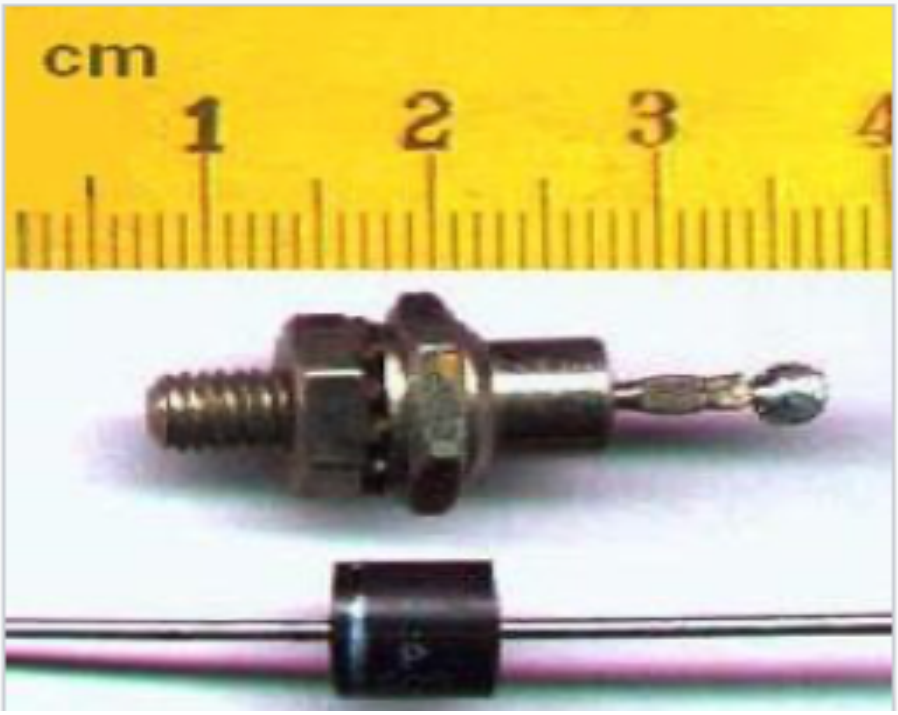
We know that a power source is where the
Electrical energy comes from.

A resistor reduces the
The current by reducing the Flow of electrons.

This week we will learn what a diode is.



Close-up view of a silicon diode. The anode is on the right side; the cathode is on the left side (where it is marked with a black band). The square silicon crystal can be seen between the two leads.



A **diode** is a two-terminal electronic component that conducts current primarily in one direction (asymmetric conductance); it h low (ideally zero) resistance in one direction, and high (ideally infinite) resistance in the other. A diode vacuum tube or **thermionic diode** vacuum tube with two electrodes, a heated cathode and a plate, in which

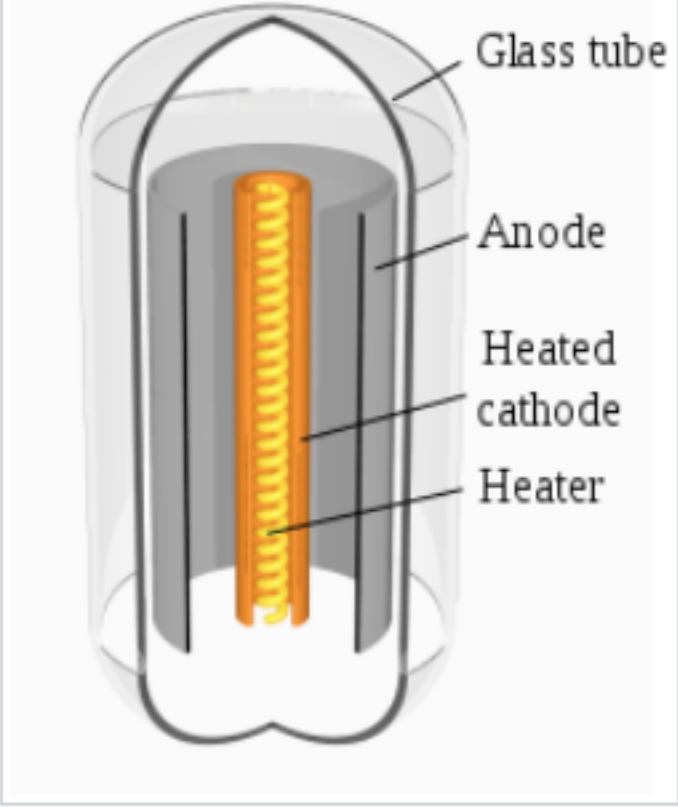
as

is a

electrons can flow in only one direction, from cathode to plate.
A **semiconductor diode**, the most commonly used type today, is a crystalline piece of semiconductor material with a p–n junctionconnecte two electrical terminals.

Remember last week -
V = I * R

Volts = Current * Resistance



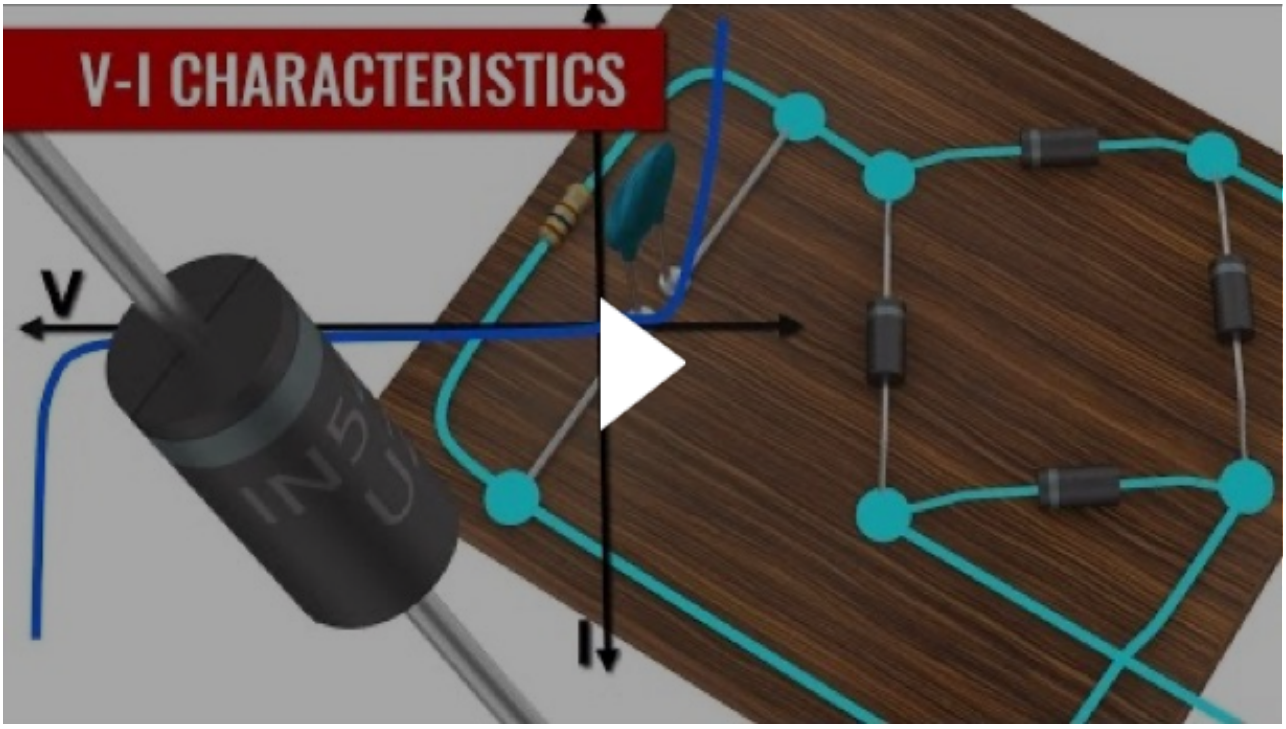
Structure of a vacuum tube diode. The filament itself may be the cathode, or more commonly (as shown here)

d to

used to heat a separate metal tube which serves as the cathode.

https1://youtu.be/JNi6WY7WKAI

How does a Diode work ?



1https://youtu.be/JNi6WY7WKAI?si=Ih_nOhxTrE0aRAoE

A **light-emitting diode** (**LED**) is a semiconductor light source that emits light when current flows through it. Electrons in the semiconductor recombine with electron holes, releasing energy in the form of photons. The color of the light (corresponding to the energy of the photons) is determined by the energy required for electrons to cross the band gap o the semiconductor.

of

Light-emitting diode (LED)

Blue, green, and red LEDs in 5 mm diffused case

Working principle	Electroluminescence
Invented	H. J. Round (1907)[1] Oleg Losev (1927)[2] James R. Biard (1961)[3] Nick Holonyak (1962)[4]
First production	October 1962
Pin configuration	Anode and cathode

Electronic symbol

Today we are going to build a circuit with the following:

(1) Power Source - both positive and negative terminals
(2) Resistor - this is important to reduce the current, and protect our current
(3) Wires to build the path of our circuit. Note: the color does not ma
(4) An L.E.D. That we will connect to verify we have current flowing.

Identify your battery pack + batteries, put your 4 batteries in back; remember the spring is the negative side (opposite of t

Please verify the switch is on OFF {O}.

Identify the breadboard rows 10 & 14,
Now identify the columns (a) - (j) along the top.

Connecting our circuit:

electric

tter

nto the
he notch).