**Topic: The journey from Light bulbs to the Modern Computer Era…And how the light Bulbs were involved in it.**  
(Yaha per hum apny topic ko thora sa explain krey ga ….Yani topi kis bara ma ha… or… sari video ko connect krey gay )

A few weeks ago we learned that Vaccum tubes technology was used in First Generation of computers. Today we shall discuss it and we shall se how???

**Introduction**: The legendary scientist Nikola Tesla…(Yaha pr hum is ka bara ma thori si bat krey gay)(Ye video ka part to nahi tha per mana add kia ha khud se kio ka presentation ma zaroori ha. Also he is my favorite scientist)

The early Light Bulbs…(yaha per early light bulbs ki Explanation ho gi)

The early light bulbs used vacuum tubes. They used filament that heats up to give light.

Some of the electrons flow out from the filament and make the tube-colored red. (Yaha small video aye gi) (1:22 to 1:43)

Scientists discovered this phenomena as thermionic emission. As we already studied in class 12 and then Scientists worked on it .

They made a device called **Thermionic Diode.** One pic ( 2:15)

(Thermionic Diode) A simple vacuum tube that consists of two filaments instead of one.

If we charge one filament as positive the current flows from one filament to another and thus the circuit completes.

But if charge both of them negative. Then the current will not flow at all. The circuit remains open . one video to explain this whole process ( 2:16 to2:26 )

So till now scientists learned to control the electron and make a switch like thing that no needs to be switched off physically

One pic ( 3:14) not 3:15 we can also use a similar one diode like this one to convert AC into DC.

This was the first practical Application of vacuum tube

Then there came the **Triode (pic** 4:43 )

Triode: It consists of a **grid** between the **anode** and the **cathode**

**This grid can control a high voltage. “This helped scientists to amplify signals”.** One video (5:01 to 5:31)

(Yaha per hum sub kush waisa hi explain ker dey ga kio ka her koi grid ko janta hi ha)

This is the working of an amplifier.

The grid accelerates the electrons and thus the signals get amplified.(one pic by Yourself)

**This made the long distanced calls Possible for the first time.(pic 6:22)**

**This invention of triode was increadibely Important …..Radios TVs and whatever the other electronics people had …They were powered by vacuum tubes till 1970s.**

**Then the technology revolutionized**

**Now scientists were not able to make future progress using the vacuum tubes .**

**So Here comes the electrical circuits:**

**(Pic of circuits by yourself)**

**Scientists discovered a connection between the “Boolean algebra” and the “electrical circuits”. (Khan yarr in ko connect kr de kisi tarha sa. Ya dono ki aik aik pic dal de.)**

**George Bool (pic of him by yourself) introduced the system of 0s and 1s**

**0 = False.**

**1 = True. (pic 7:30)**

**He also introduced operations like AND NOT NOR OR e.t.c.**

**Later on scientists discovered methods to do these operations using electrical circuits…But these circuits still use switches which turns ON and OFF Physically.**

**------------------------------------------------------------------------------------------------------------------**

**This is how the circuits work**

**Video 8:35 to 9:22 (is ko hum explain krey ga video ka zaria)**

**Video 9:56 to 10:22 (ye video ka baki hisa ha)**

**Video 10:31 to 10:42 (ye use video ka next hisa ho ga)(in teno ko combine krna ha)**

**This made the first calculator computer Modal 1 (pic from 10:430)**

**That can add and multiply numbers upto eight digits..**

**But the Problem was same ….The Switches That ON and OFF physically…**

**This made the computers load and Almost useless.**

**And there the Vaccum tubes comes Again**

**The vacuum tube allows the Flexibility that it can be controlled without any moving parts**

**The vacuum tube allows the Flexibility that it can be controlled without any moving parts**

**So no Physical ON and OFF switch**

**So you can switch between 0 and 1 immediately.**

**Then the first programmable computer called ENIAC came out.**

**ENIAC: It took the whole room and weight 30 tons and takes a lot of energy to run.**

**It also showed the output by light bulbs (video 14:46 to 14:54) ese edit bi krna ha pr bad me abi ese hi lga do.**

**It could be programmed**

**It could perform mathematical operations ………..500 operations in one seconds**

**This is how a one bit vacuum computer looks like. ………………… (Video 15:38 to 16:06) ese edit bi krna prey ga pr bad ma krey ga**

**Vacuum tubes had a lot of disadvantages as well…**

**(Wo wesy hi yad kr ka bta dey ga)**

**The next Gen computers;**

**The next gen computers are all because someone figured out how to fit the same principle as of vacuum tubes or triodes into the silicon chips.**

**Means to control electrons to perform ON and OFF(0s and 1s) switch operations inside of the nano chips.**