Intro Lesson

Potato Light

In this lessons I want to teach you about Voltage and Current which are very important when we talk about.

I also want to introduce you to a few componets that we will use in order to complete this lesson. The first component is the a battery, now most of the time when we talk about a battery we would be talking about a 2in cylinder that puts out 1.5V in this case we are talking about a potato which we will go in depth on later in this lesson. The second component is wire for this lesson we will be using bare paperclips to act as the wire again we will go over conduction later in this lesson. The final component is the LED this stands for Light emmitting diode, we will be using this component as the light for the potato light.

So how does a potato become a battery well first the potato has a particular acid called phosphoric acid along with a positive and negative leads these leads will be a penny and a dime or nickle. Now the penny and dime will reacte with the chemicals within the potato (phosphoric acid) thus giving the potato some power to work with (Not a lot though).

The paperclips will act as wires because they have an extra electron (-) it makes the paperclip a pretty good conductor or at least good enough for what we need. We will discuss the electron in more detail in later lessons.

Now the LED again stands for Light Emitting Diode these components are used in all kinds of electronics these days including but not limited to TVs, Flashlights, Professional lighting, etc... We will not go into detail on how the LED works in this lessons, but it is important to note that the LED is a semiconductor just as the regular diode is. Another thing to mention is that an LED has 2 leads one is the positive lead also known as the Anode (+) and Cathode (-)

Let's get started with the exercise:

First let's gather the components we will need for this project:

you will need:

2 potatoes

several Paperclips that do not have any shielding

1 LED (a red LED will work well)

Now we just need to put everything together.

first let's get the potatoes. We will need to put a penny and dime in each of the potatoes

{Video of potatoes getting dimes and pennies put into them}

Now let's make the paperclip chains

these will be used to connect the potatoes together to get a little more juice, so that we can get a brighter LED.

{Video of chans being made}

Now let's connect the first chain to the Penny which will be the positivelead of the batter as the Zinc in the dime will be the negative lead which you will need to connect the second paperclip chain to. Make sure you do not short the leads of the paperclip chains, in this case nothing will happen but with a normal battery it could rupture and harm you if you short the power and ground leads

{Video demonstration}

Let's now see how the LED looks with a little bit of power. Connect the Anode (+) this is also the longer lead on the LED this will need to be connected to the paperclip chain that is connected to the penny (+). Next connect the Cathode (-) of the LED to the chain that is connected to the Dime.

{Video Demondtration}

\*\*Elaborate on the fact that connecting the LED backwards will not hurt the LED as it will just act as a reverse bias diode\*\*

The LED is pretty dim; if we want to make it brighter we can add another potato (Battery), let's go ahead an do that now:

{Video Demonstration}

Now why did we get a brighter LED?

This is due to the higher power Voltage \* Current we have created a more powerful battery more importantly we connected the batteries in series which means we double the voltage of our battery.

That is it for this intro I hope you have enjoyed it. In the next lesson Iwe will be going through the basics of the Arduino IDE, also controlling the Arduino with a basic paperclip switch, and finally reading voltage from a potato on an analog input of the Arduino.