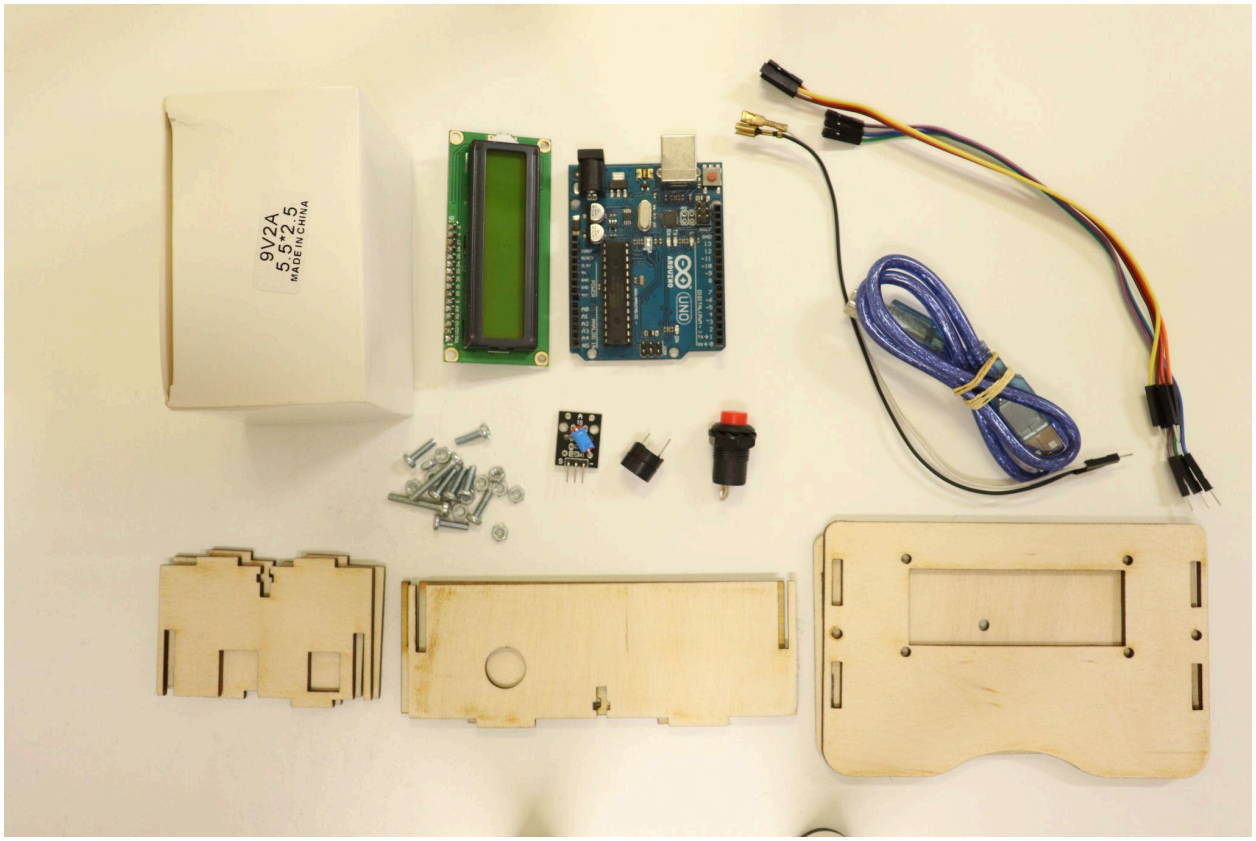
hitTheNumber! Game Kit - Construction Guide

This kit contains 3 main categories of components:

- Construction wooden kit
- Inputs, Outputs and wires (Electrical Components)
- Screws, Nuts and Screwdriver



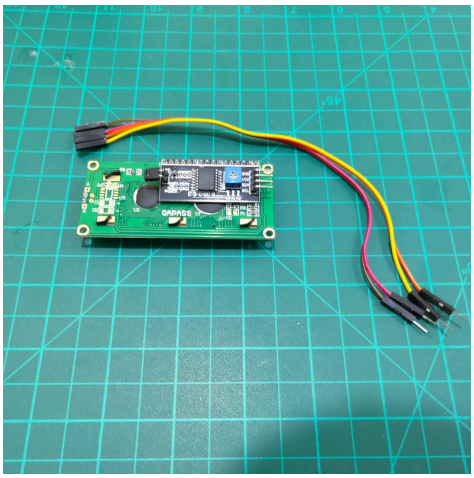
Step 1: “Circuit Test”

Plug wires into the LCD.

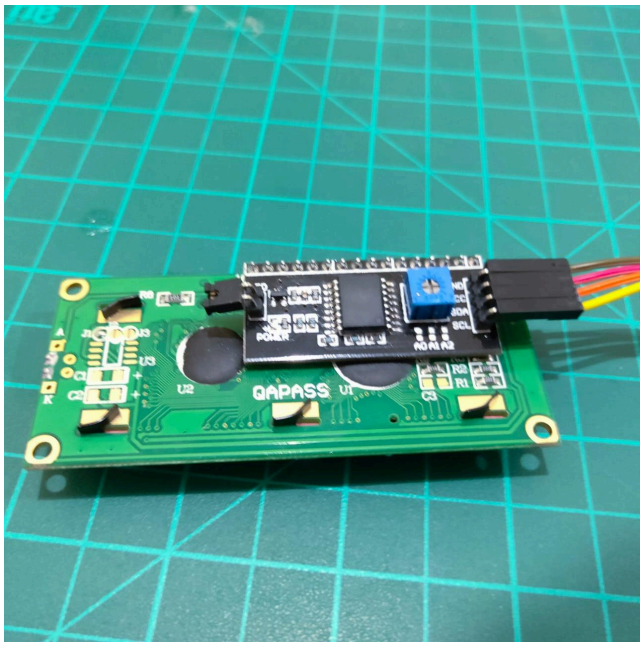
<u>Notice:</u> Please note that there is a color code to wires make sure you stick to it for now. The kits you already have have a few wire sets on it; LCD will be plugged with 4 wires; if you look closely on the LCD you will see some text near each pin where you should be plugging wires. Starting with GND ends with SCL. The color code for this component is brown on GND goes through yellow on SCL.

Components:

1. LCD screen jump
2. 4 Jumpers -wires-



The result of this step should look like this:



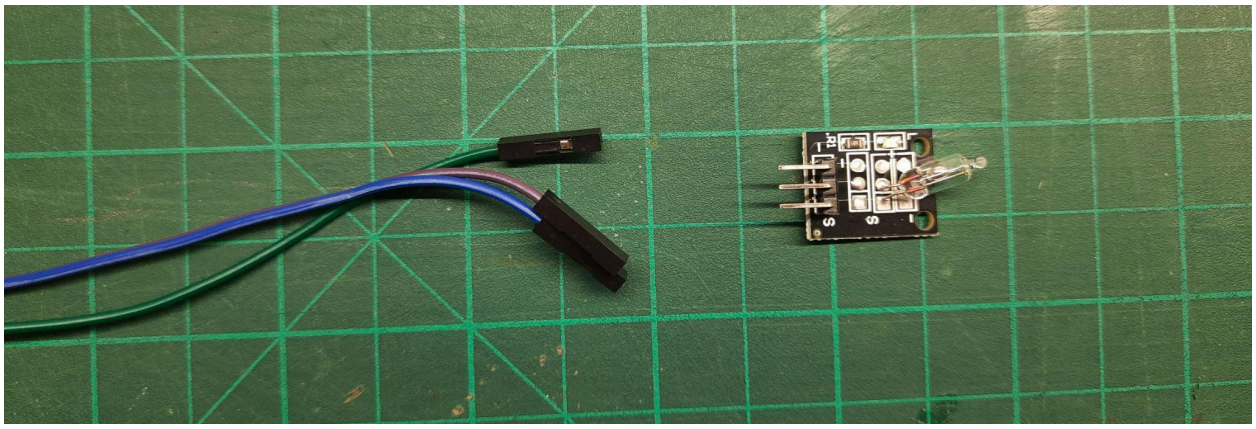
Step 2:

Plug wires into the Tilt Sensor.

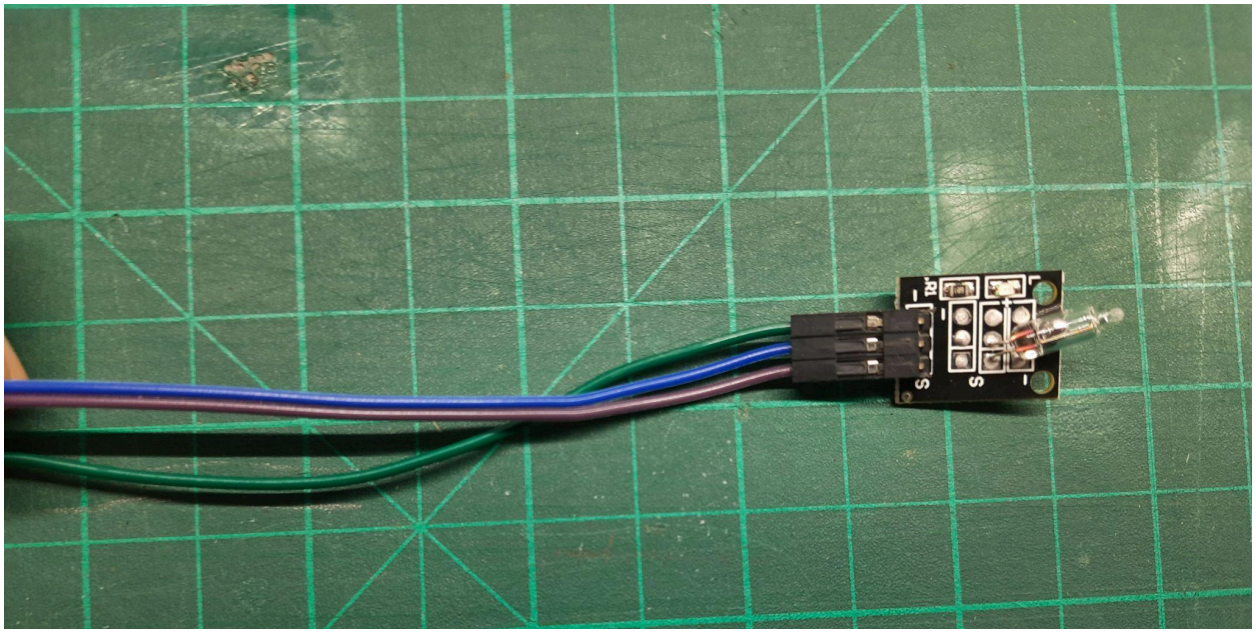
<u>Notice:</u> Similarly for the Tilt sensor it will start with green for the minus sign (-) goes to purple for the (S) letter.

Components:

1. Tilt Sensor
2. 3 Jumpers -wires-



The result of this step should look like this:



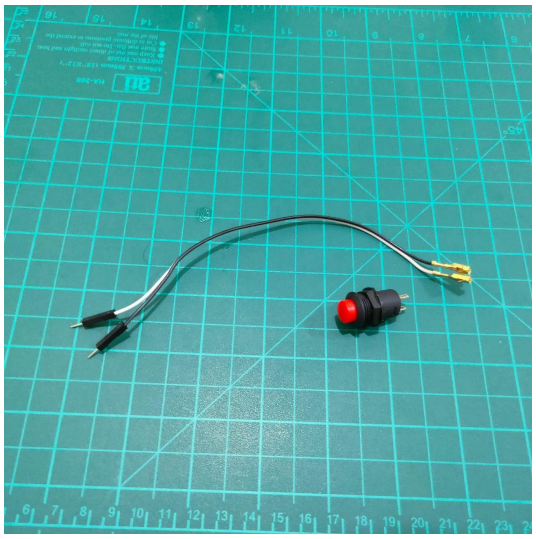
Step 3:

Plug wires into the Push Button.

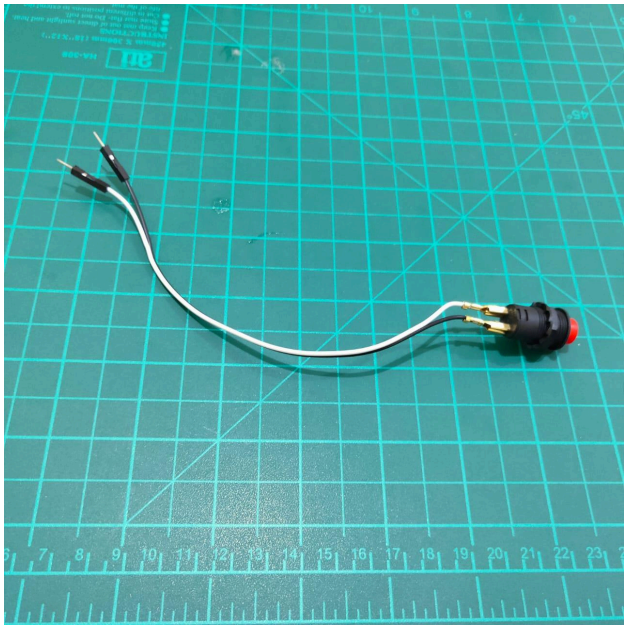
<u>Notice:</u> Finally the push button will be plugged in a slightly different way as it has different type of wires and there is no indication which should go where. It is a nonpolar component -something we will learn more about later on- but for now just plug the 2 wires wherever you want.

Components:

1. Push Button
2. 2 Jumpers
3. Buzzer with Arduino



The result of this step should look like this:



The result of this step should look like this:

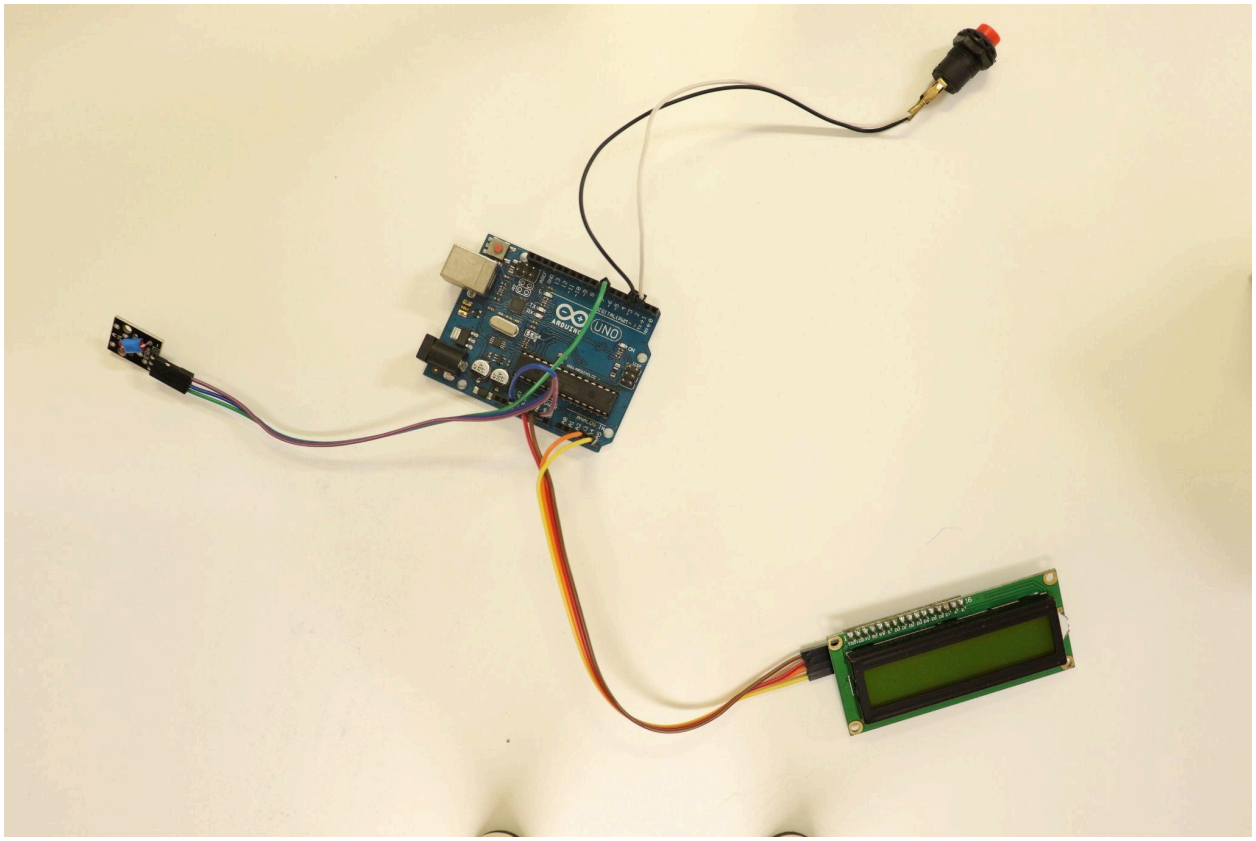
Step 4: Connect with Arduino

In this step we will connect all components we previously wired with Arduino. We do that, to test all the electronic components before going through the casing assembly process. In case we found any malfunctiona or misbehavingl components it will be easy to fix or replace it in this step!

- Brown LCD wire goes to GND pin
- Red LCD wire goes to 5V pin
- Orange LCD wire goes to A4 pin
- Yellow LCD wire goes to A5 pin
- Purple Tilt wire goes to 7 pin
- Blue Tilt wire goes to 3.3V pin
- Green Tilt wire goes to GND
- Push button wires goes to 2 and 3 Pins
- Buzzer direct on Arduino GND and Pin 11

After wiring the electronic components, bring your power adapter, plug the black adapter jack into the circular hole of the Arduino [Not the square hole], and the adapter itself into the wall socket. The LCD screen should light up and display some readable text, when press the push button the counter on the LCD screen should stops, when you tilt the tilt sensor in opposite directions it should affect the counting speed(increase and decrease).

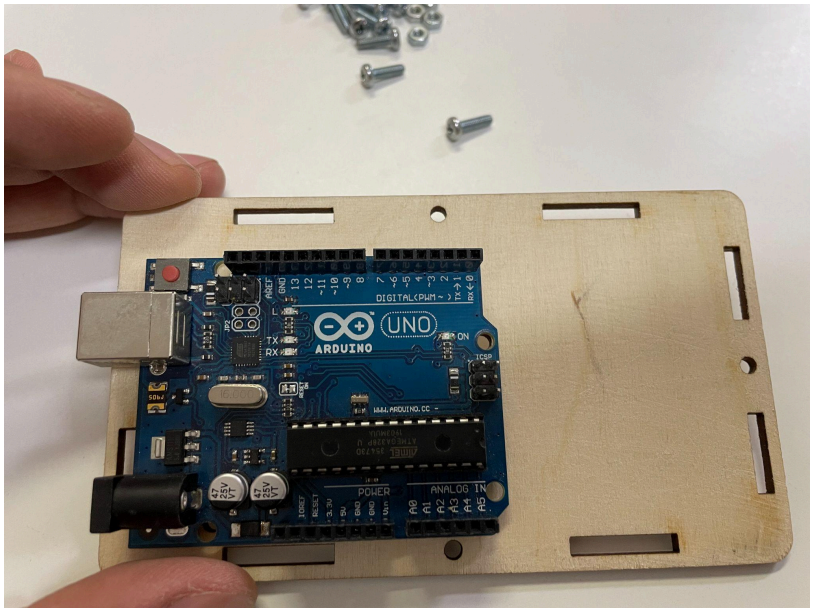
The result of this step should look like this:



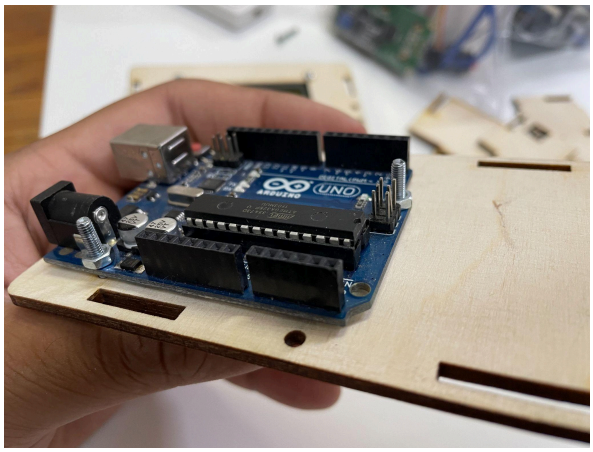
Step 5: “Preparations”

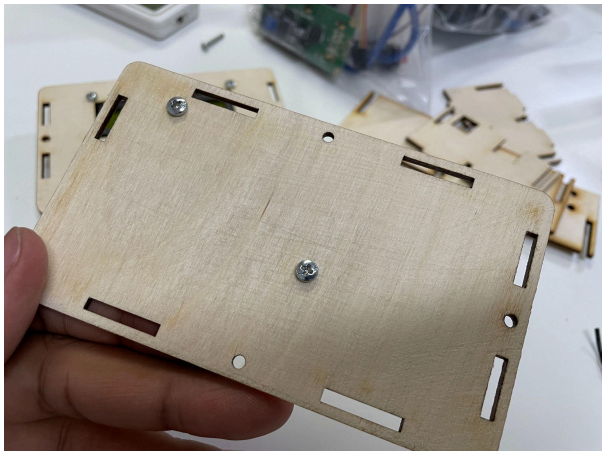
<u>Notice:</u> Unplug components from arduino but keep each component wired the same way. As it will be hard to fix components when they are plugged into the arduino.
Install the Arduino UNO board on the base part of the game kit using the provided screws, nuts and the screwdriver.
<u>Notice:</u> There are 2 holes installed in the base part which fit to holes in the arduino, please use the suitable orientation.
Components:

1. Arduino UNO Board (1).
2. Base Part of the Game Kit (1).
3. Screws (2) - “The Taller Ones”
4. Nuts (2).
5. Screwdriver (1).



The result of this step should look like this:





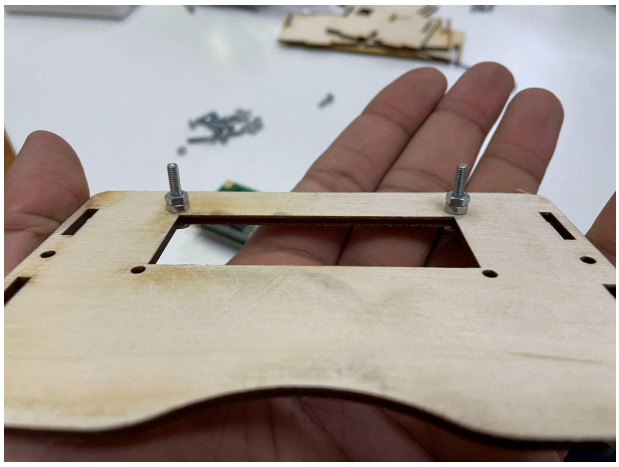
Step 6:

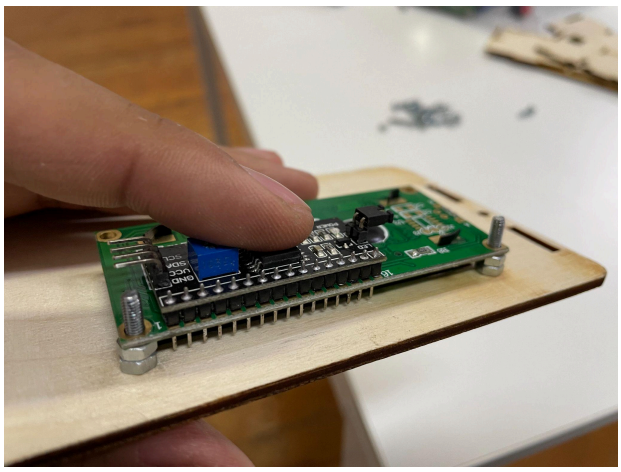
Install the LCD screen on the game kit front face part.

<u>Notice:</u> Because of the set of pens on the upper front face of the lcd screen you might have some hard time during fixation. You can insert two screws on each hole of the upper part as shown -in order not to pressure the pins into wood as it might cause some failures-. Put screws through holes then insert 2 nuts on each screw then place the LCD after and finally fix the LCD in place with nuts.

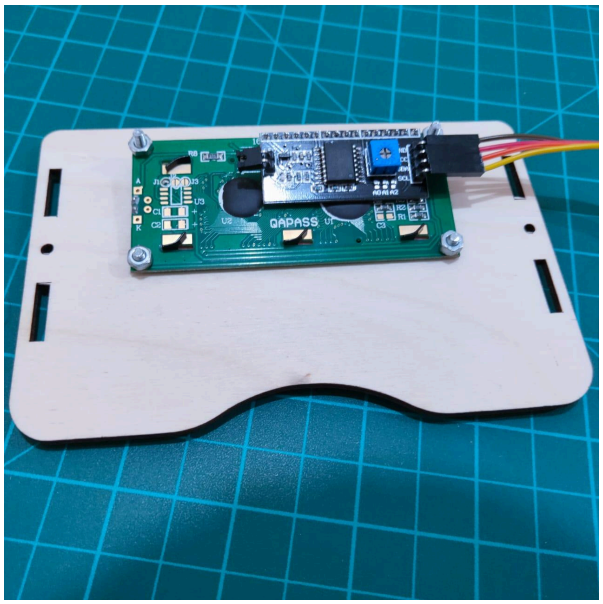
Components:

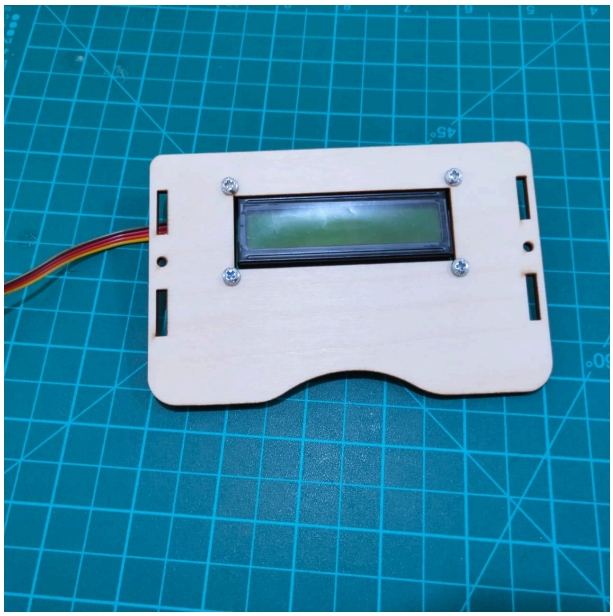
1. Front face Part of the Game Kit (1).
2. Long Screws (4).
3. Nuts (4).
4. Screwdriver (1).





The result of this step should look like this:





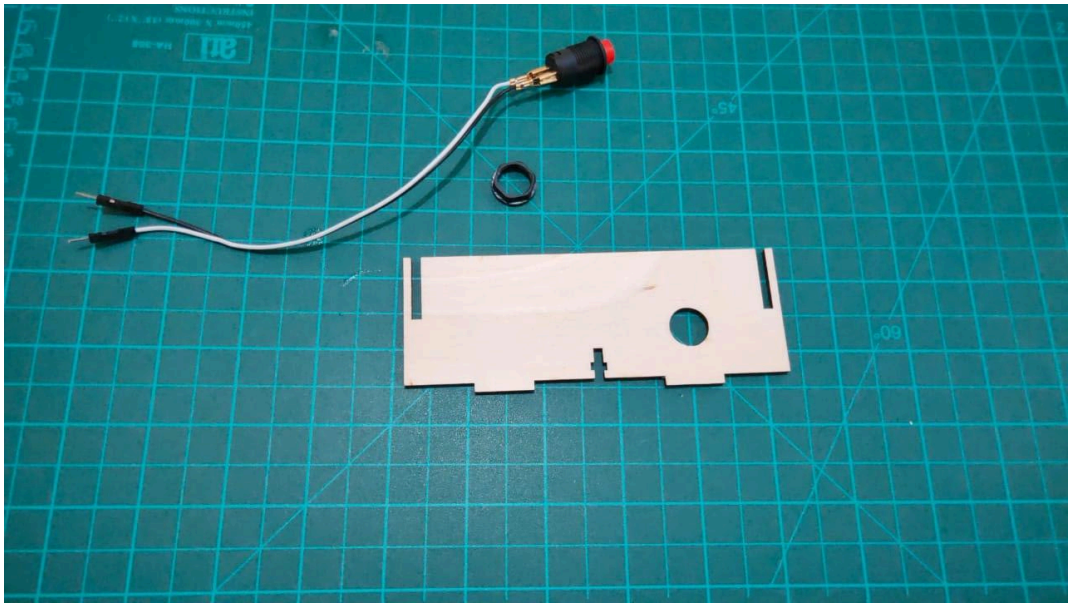
Step 7:

Install a push button to the game kit back side face.

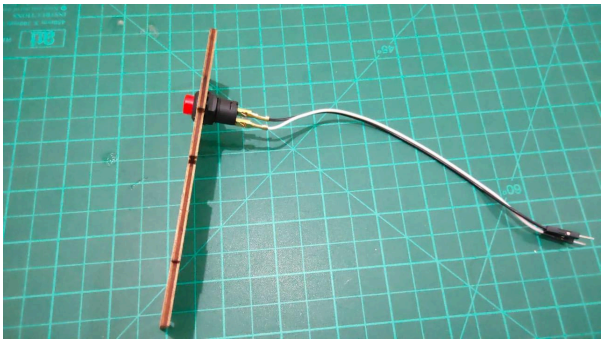
<u>Notice:</u> The button nut might be fixed in the button, so you can just unscrew it and fix it as it should be. The purpose of the nut is to hold the button in place. Also be careful not to unscrew any other part of the button.

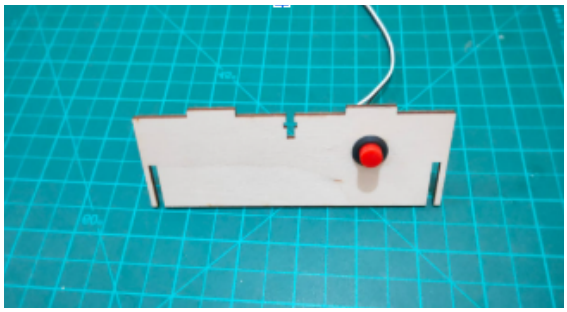
Components:

5. Push button
6. Push button nut



The result of this step should look like this:



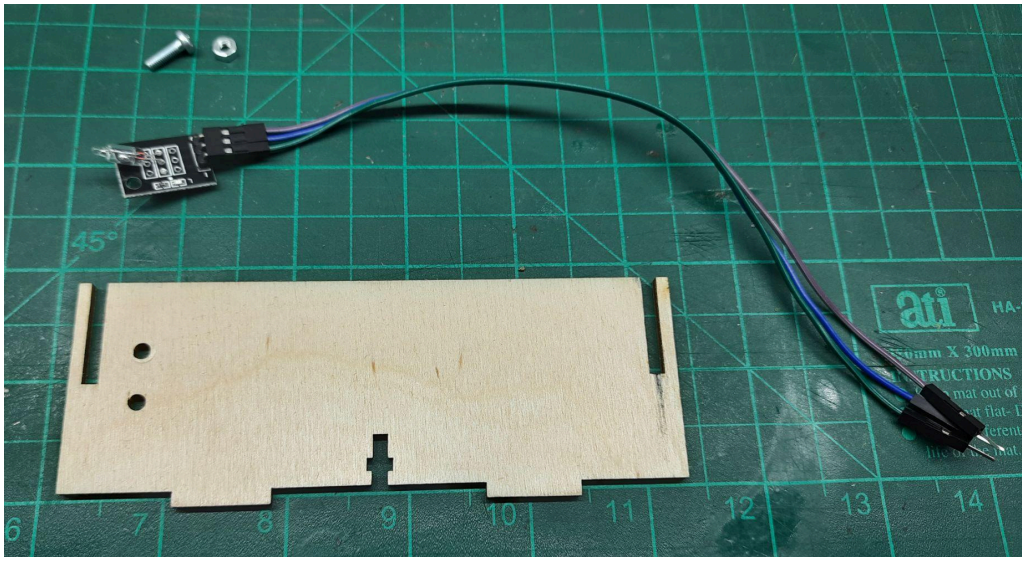


If you are facing the side part, the Tabs up, the button on the right and the x-slots down

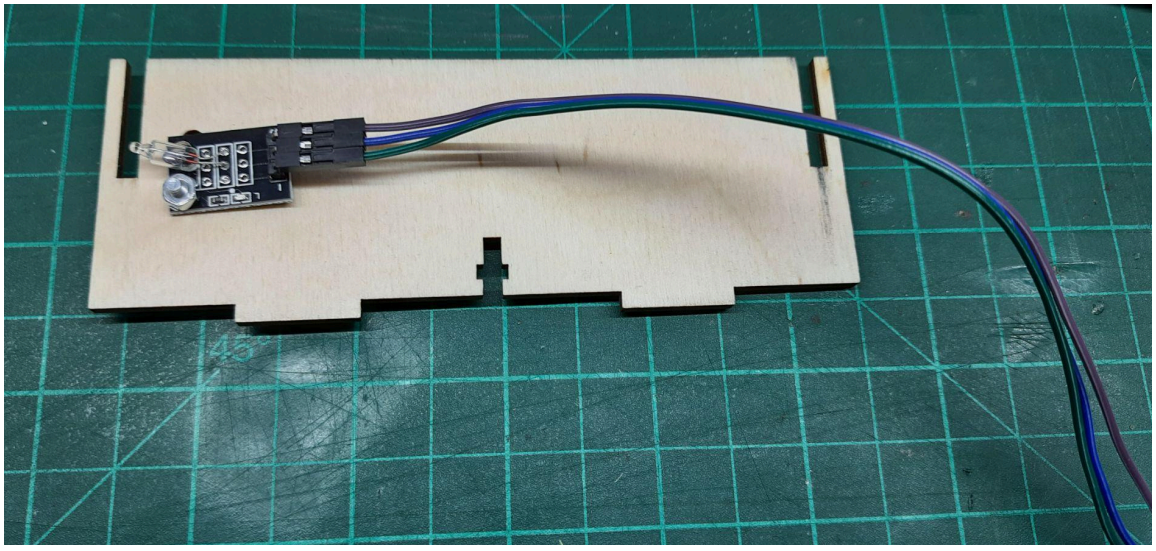
Step 8:

Install the Tilt Sensor into the inner side of the suitable part of the kit.
<u>Notice:</u> Most of the kit parts are a bit similar to one another, but for example the suitable side for this step should have a hole installed on it in order to fix the sensor.
Components:

1. Side face Part of the Game Kit (1).
2. Tilt Sensor
3. Screws (1).
4. Nuts (1).



The result of this step should look like this:



Step 9:

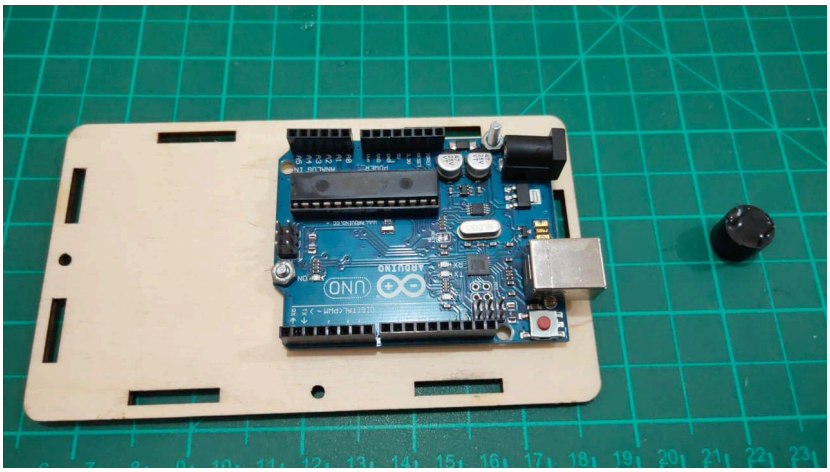
Install the buzzer on the Arduino UNO board. The buzzer long terminal **(Leg)** will be inserted on Arduino's pin D11 **(Number 11 pin on Arduino)** and the short terminal **(Leg)** on the GND pin.

Components:

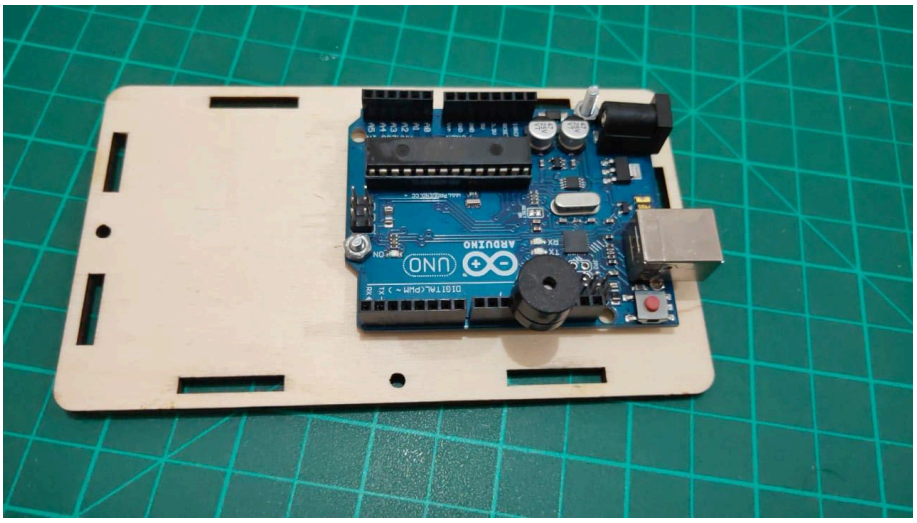
1. Buzzer (1).
2. Arduino UNO + game kit base part. (Installed in Step 1)

Connections guide:

- Long terminal(Buzzer) → D11 (Arduino UNO).
- Short Terminal(Buzzer) → GND (Arduino UNO).



The result of this step should look like this:

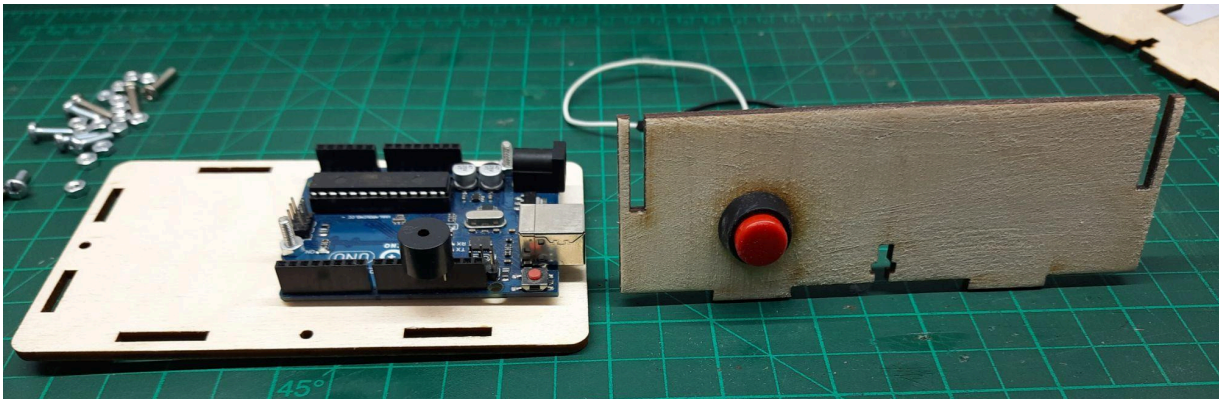


Step 10: “Assembly”

From here forward we will be joining the kit parts together, we will be starting with the base part -the one that contains the arduino- and the side part -the one that contains the push button-.

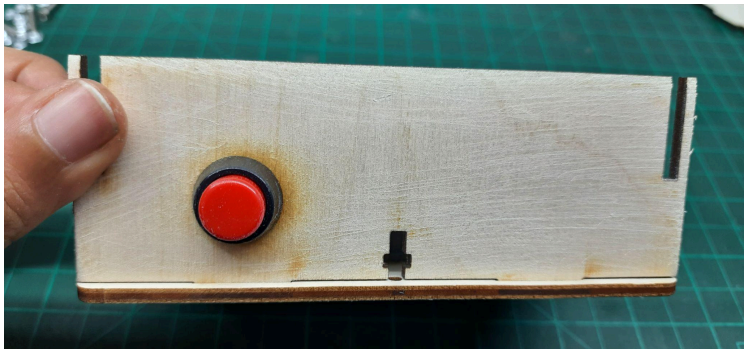
Components:

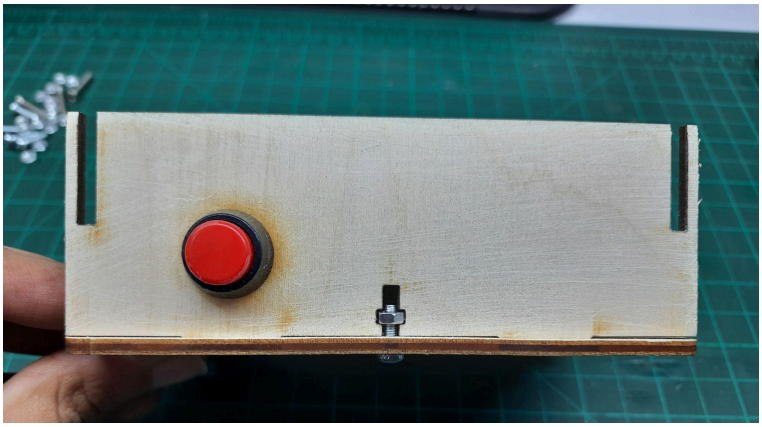
1. Base part -Arduino Side-
2. Side part -Push button side-
3. Screw and Nut (1)



The result of this step should look like this:

<u>Notice</u>: The way these parts are fixed is through a technique called “T-Slot Joint”, which fits to parts together then connects them with a screw, then holds the screw with a fixed nut.

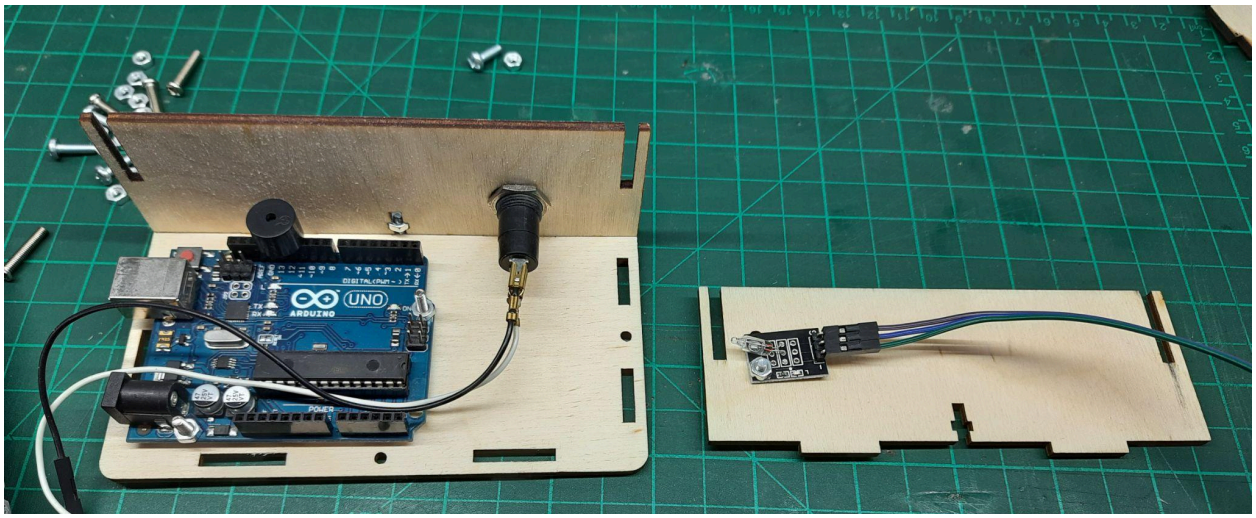




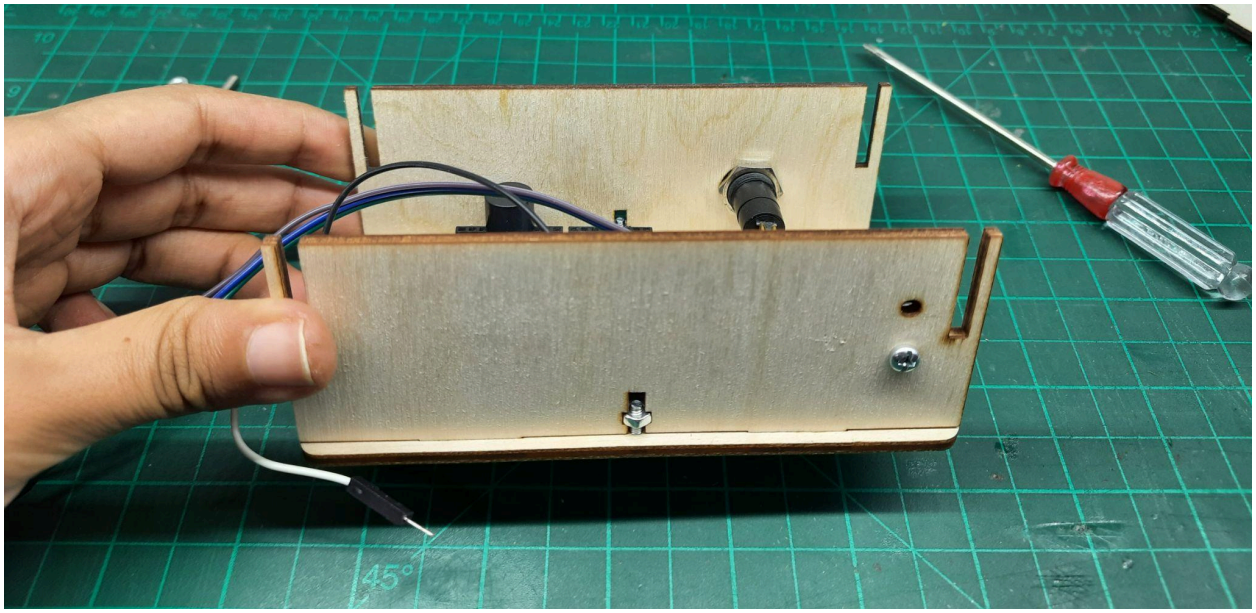
Step 11:

Now we join the side part which contains the tilt sensor to the part from the last step.
<u>Notice:</u> The tilt sensor should be inside the container, make sure you fix the parts in a way that assures that. Also make sure the tilt sensor is on the same line with the push button; if you flipped it the other way it will conflict with the Arduino on board. Make sure that you fix the screw on the hole downward of the tilt sensor.
Components:

1. Side part -Tilt Sensor Side-
2. Step 10 output part
3. Screw and Nut (1)



The result of this step should look like this:

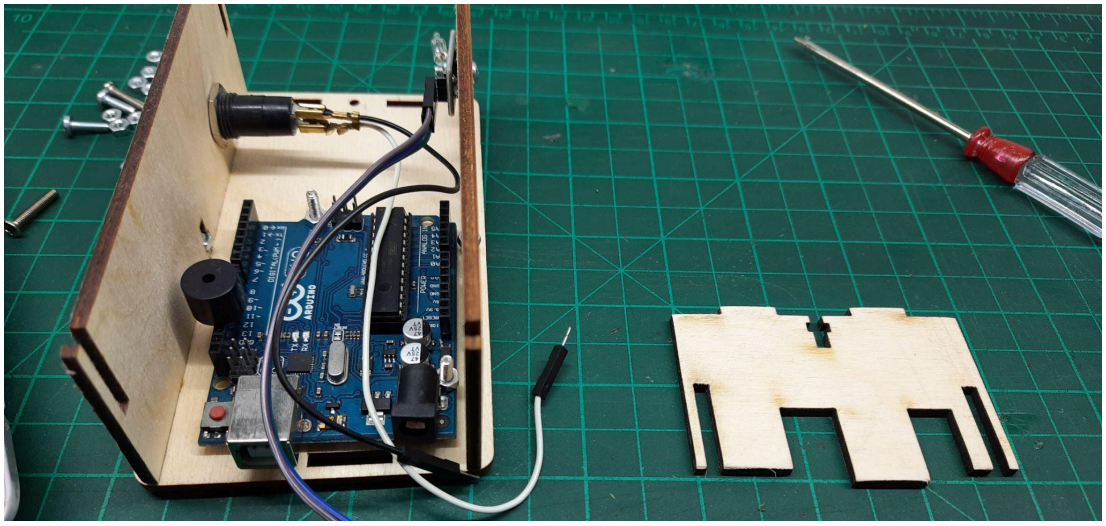


Step 12:

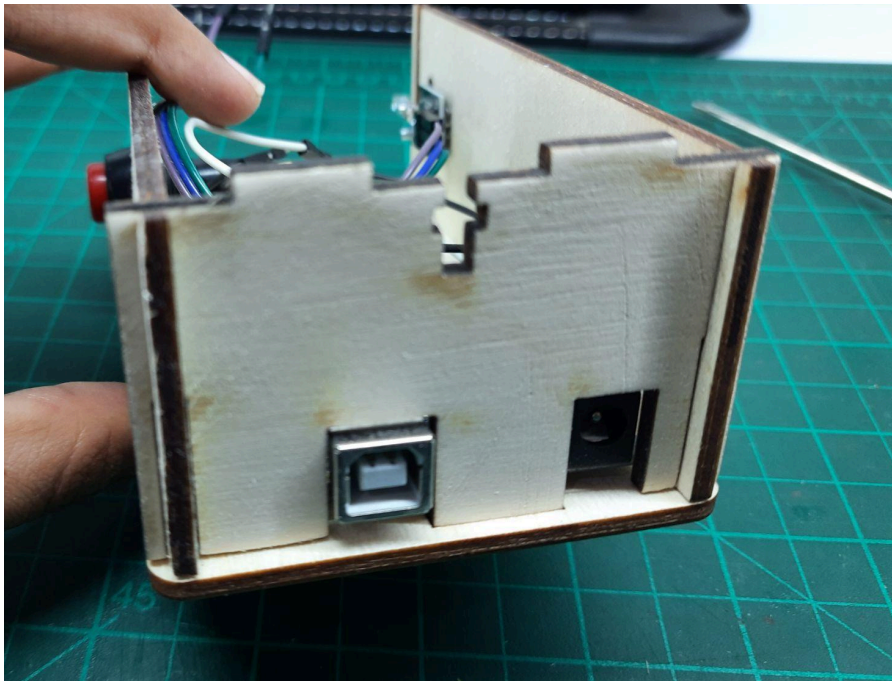
Now we take the output of the last step then connect it with side that contains nothing but a t-slot.

Components:

1. Side part -Free part-
2. Step 11 output part



The result of this step should look like this:

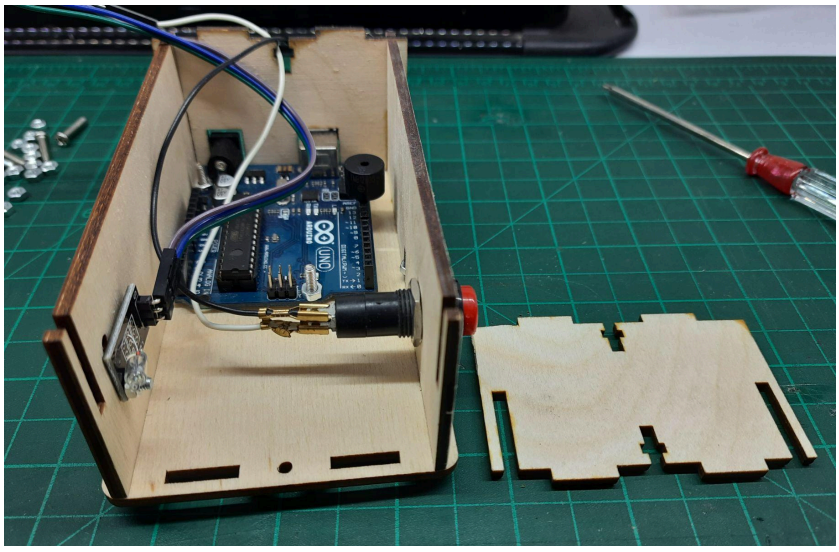


Step 13:

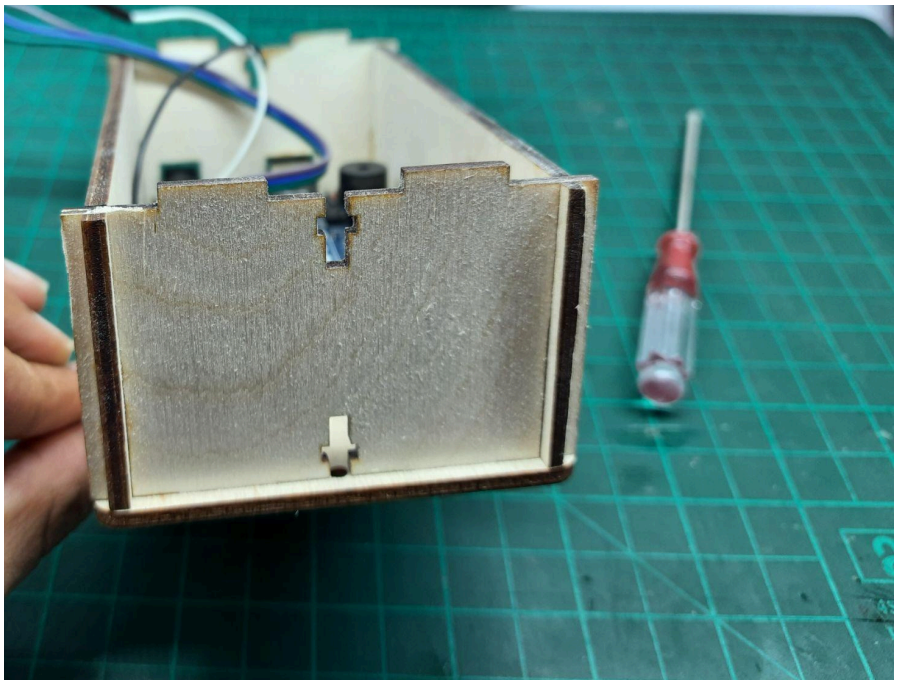
Now we take the output of the last step then connect it with side that contains nothing but a t slot.

Components:

1. Side part -Free part-
2. Step 12 output part
3. Screw and Nut (1)



The result of this step should look like this:



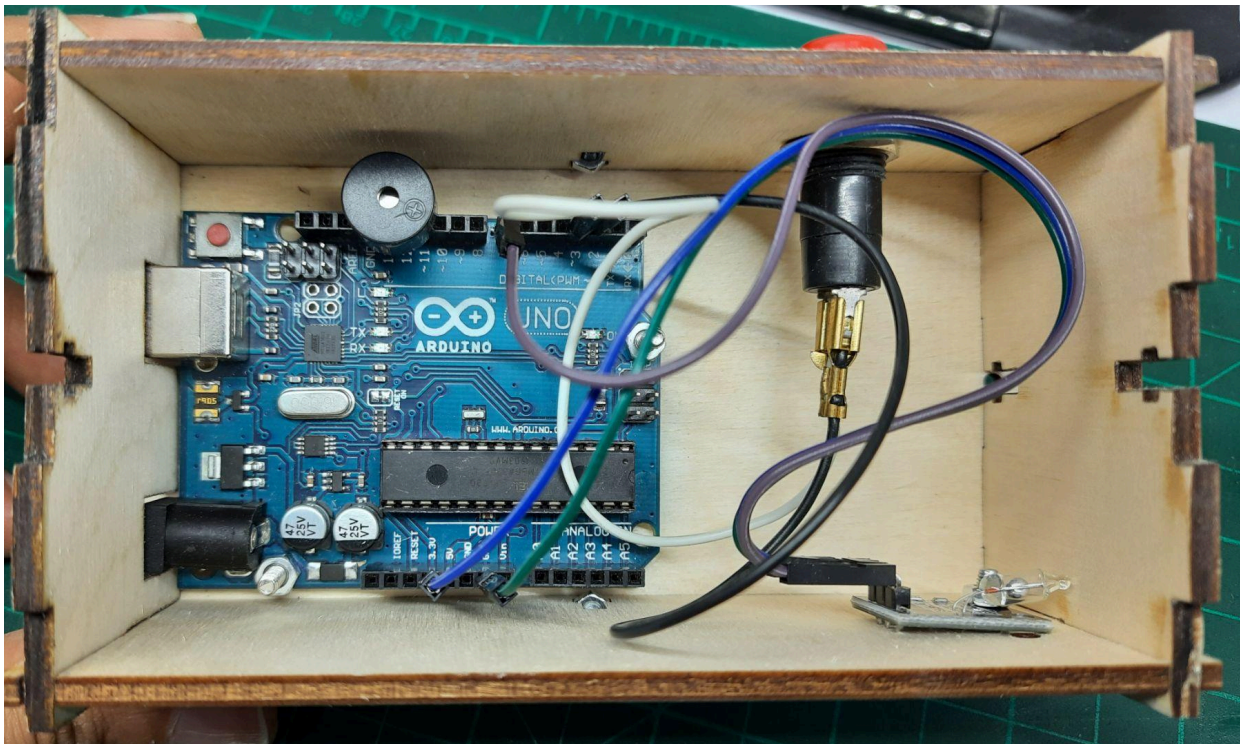
Step 14: “Electronics Connections” pt1

The result of this step should look like this:

<u>Notice</u>: You should be using the configuration from step 4 with the Color code to wire correctly.

Also please check this link for a clear pin configuration of arduino:

https://hackster.imgix.net/uploads/attachments/235491/y43dfOnuindP3OaiiosV.uploads/tmp/08369dd4-0235-4017-a553-4f05a166bf6e/tmp_image_0?auto=compress%2Cformat&w=900&h=675&fit=min

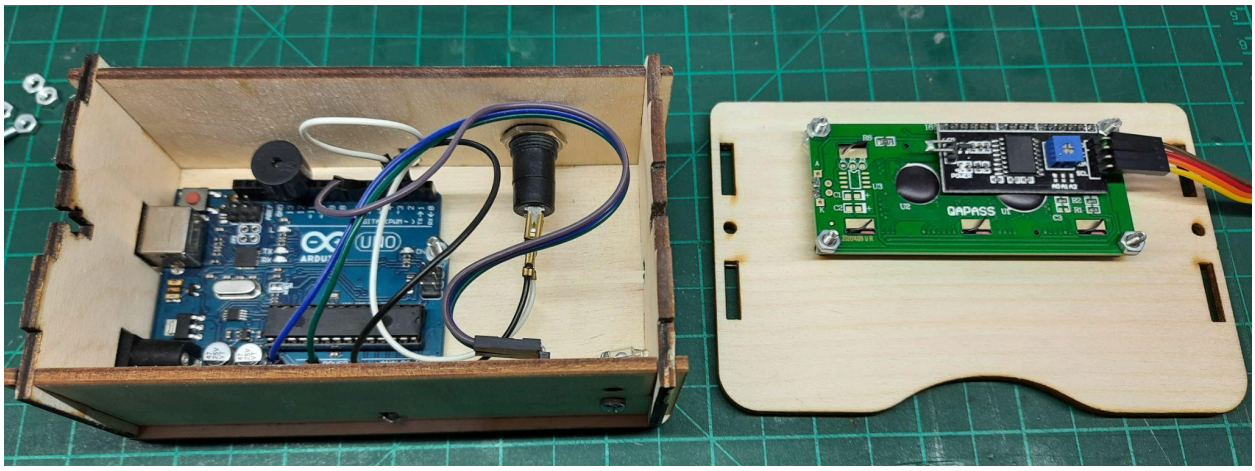


Step 15: “Electronics Connections” pt2

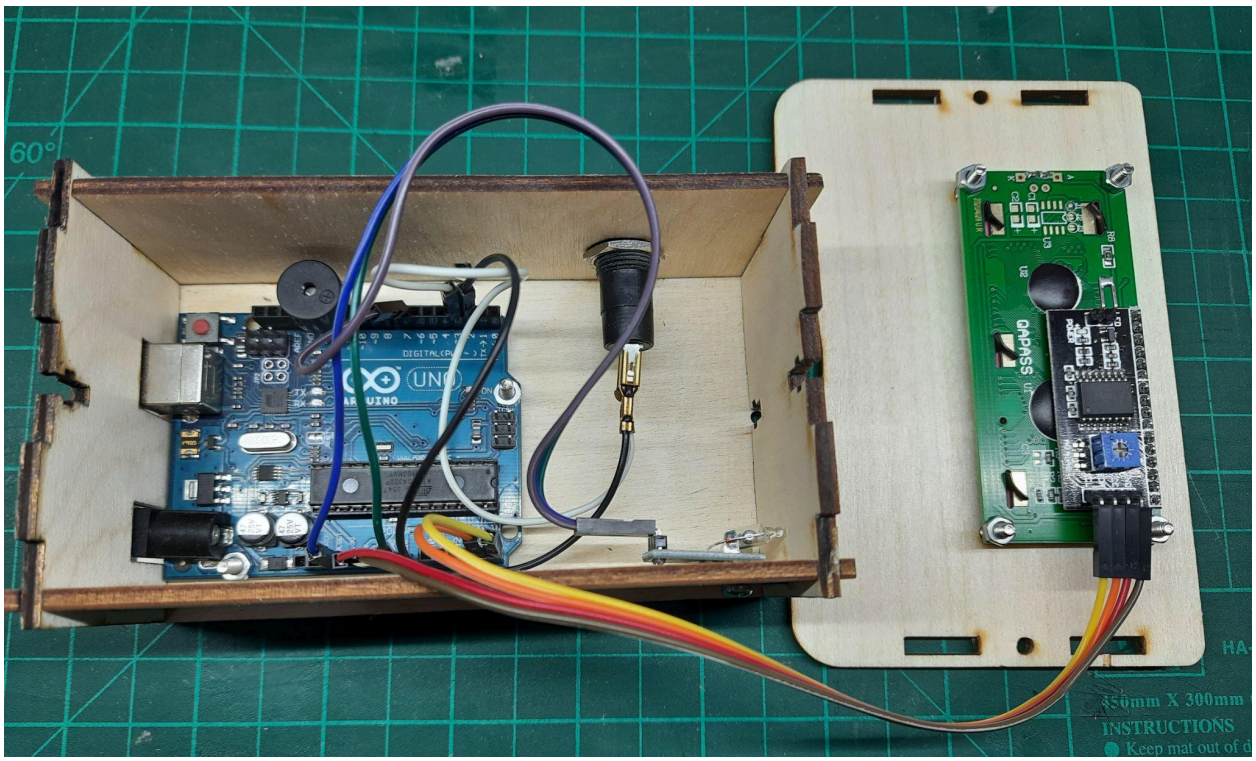
In this part we will plug the LCD screen into Arduino

Components:

1. Step 14 output Part
2. LCD



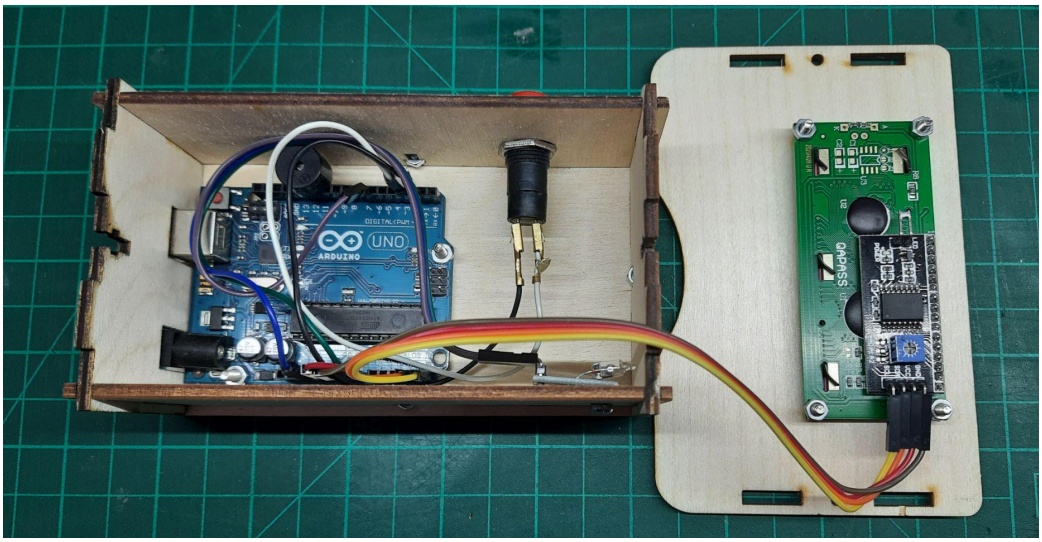
The result of this step should look like this:



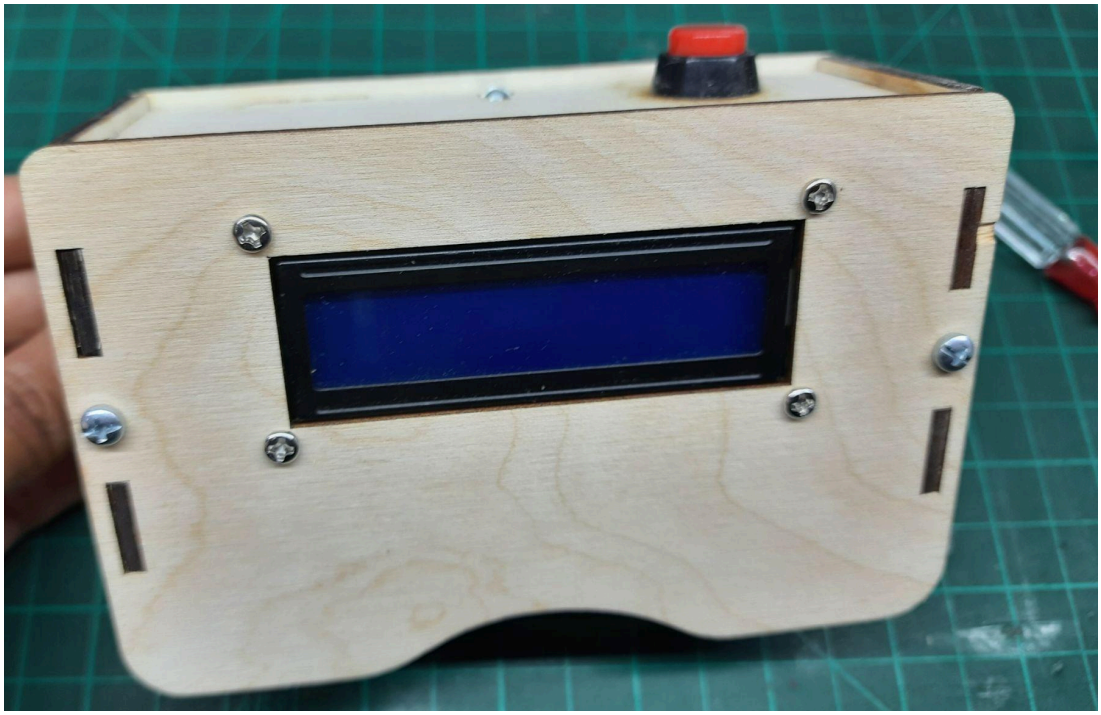
Step 16: “Enclosing”

At this point all the wiring is done, all components are connected to the arduino, all we need to do now is to fix the LCD side on the top of our assembled box.

<u>Notice</u>: You might have some hard time pushing wires into the box to place the LCD part in its place, so please do this in a smart way, you can twist wires carefully, push them slightly in order to place them inside the box. Make sure you do not move or unplug any wire while doing so.



The result of this step should look like this:

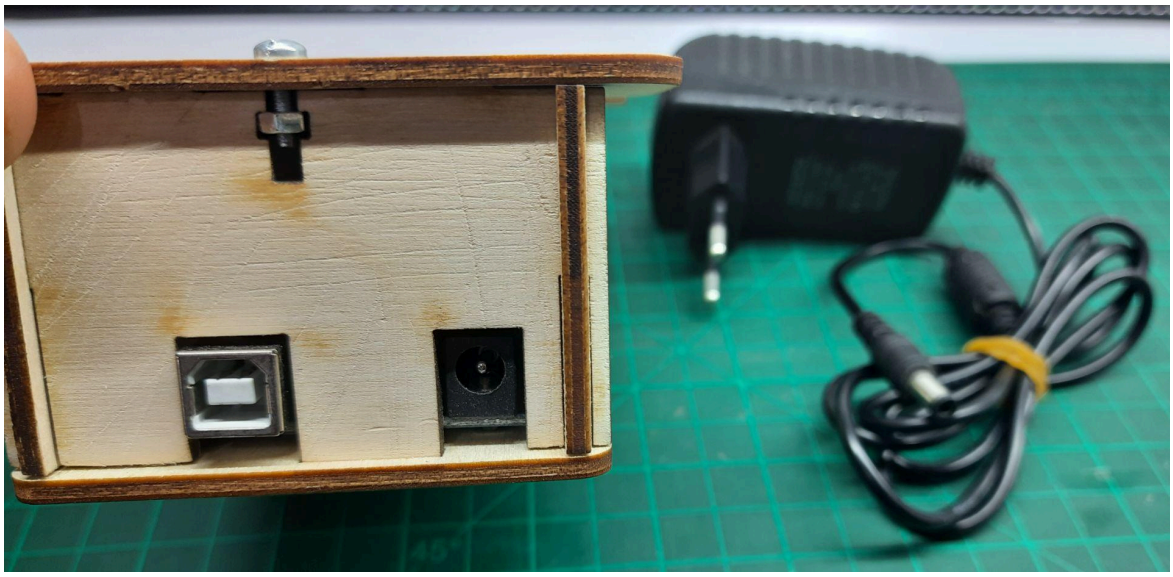


Step 17: “Are you ready to play?”

Now you just need to bring your power adapter, plug the black adapter jack into the circular hole of the Arduino [Not the square hole], and the adapter itself into the wall socket. Voila! Now you're ready to play, show us your best score!

Components:

1. Step 16 output Part
2. 9V Adaptor



The result of this step should look like this: