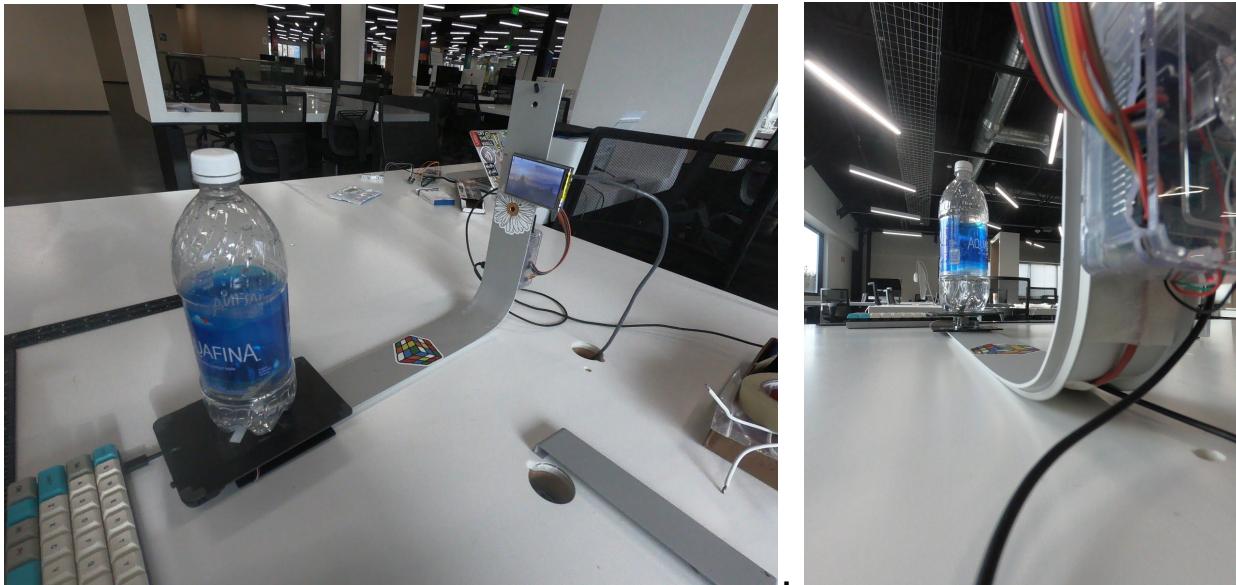


Rubix (mark I)

(Smart Consuming Automation)

Hardware by Jarrod Hatting (42 silicon Valley)



Instruction manual:
January 2020.

Set Up Raspberry Pi



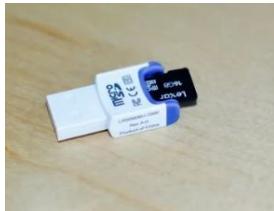
What you'll need to get started with Raspberry Pi

- The Pi: [Raspberry Pi 3 Model B+](#) (\$40 at Amazon)
- microSD card: [SanDisk Ultra 32GB microSD card](#) (\$8 at Amazon)
- microSD card reader: [SanDisk Mobile Mate microSD card reader](#) (\$13 at Amazon)
- Power supply: [CanaKit 5V Raspberry Pi Power supply](#) (\$10 at Amazon)
- USB keyboard: [AmazonBasics Wired Keyboard](#) (\$14 at Amazon)
- USB mouse: [Logitech B100](#) (\$10 at Amazon)
- Pi Camera (\$10 at amazon)
- LCD Touch Screen Module (\$20 at amazon)
- HX711 (\$5 at amazon)
- Load Cell (\$5 at amazon)
- Assorted Nuts, Bolts, Wire, solder, glue, tape and tools (\$50)

You'll also need a monitor or TV that accepts either HDMI or composite video input. HDMI works best, but composite video is workable. Many Raspberry Pi projects use an internet connection, so you'll also want a Wi-Fi dongle or ethernet cable.

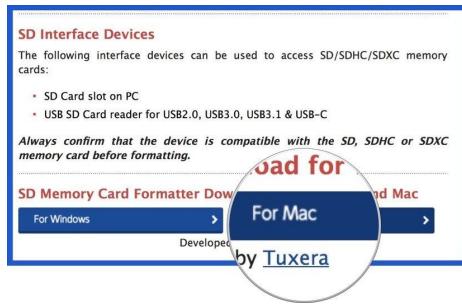
How to reformat your microSD card

1. Insert your microSD card into the USB card reader.



2. Connect the card reader to your computer.

3. Download SD Formatter 5.0.1.



4. Double-click on Install SD Card Formatter 5.0.1.mpkg in your downloads folder in your Dock to install SD Formatter 5.0.



5. Follow the instructions in the installation window.
6. Click the Launchpad icon in your Dock. It looks like a silver rocket ship.



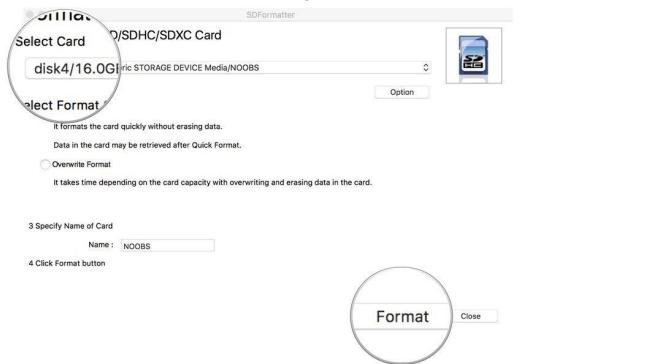
7. Find the SD Formatter 5.0.1 app.
8. To move between Launchpad windows, click the Next Page icons at the bottom center of the screen, or swipe to the right or left with your trackpad or Magic Mouse.

- Click on the SD Formatter 5.0.1 app to open it. A formatting window will appear on your desktop.



- Under Select Card select your microSD card from the dropdown menu.

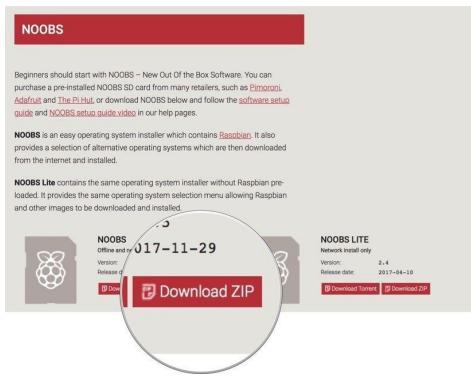
- Click Format in the bottom right corner.



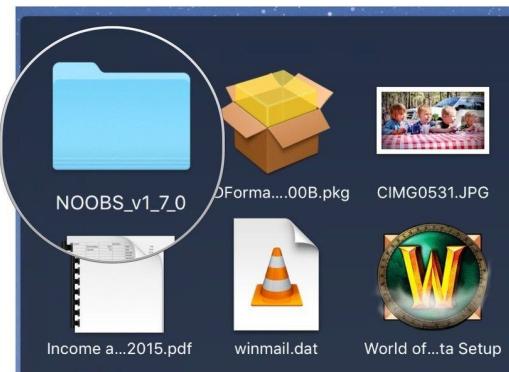
When the reformat is complete, you will get a notification window. Select OK to close the window. Your microSD card is now ready to install the operating system to the Raspberry Pi.

How to Download NOOBS onto the microSD card

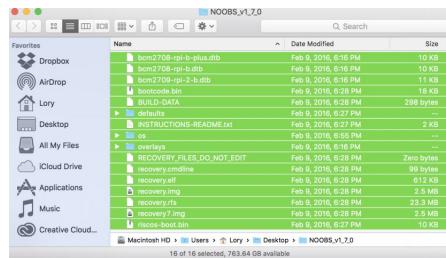
- Download the ZIP file of [NOOBS Version 3.0.0](#). It is a large file and will take a while to complete. You will want Raspbian, so do not download NOOBS Lite.



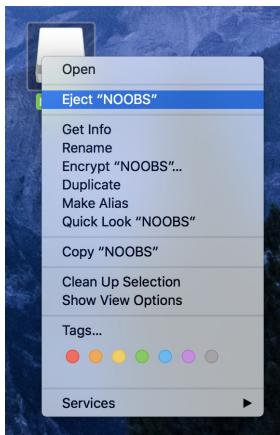
- Double-click on the NOOBS file from the Downloads folder in your Dock to open it.



- Select the first file inside the NOOBS folder.
- Scroll down and Shift + left-click on the last file in the NOOBS folder.
- Drag and drop all selected NOOBS files into the SD card icon on your desktop. You don't have to open the SD card drive.



- Right-click on the SD card icon.
- Select "Eject [SD Card Name]".



- Remove the card reader from your computer.
- Remove the microSD card from the card reader.

Now that NOOBS is loaded onto your microSD card, you're ready to set up your Raspberry Pi.

Set up your Raspberry Pi

1. Insert the microSD card into the card slot on the underside of the Raspberry Pi.



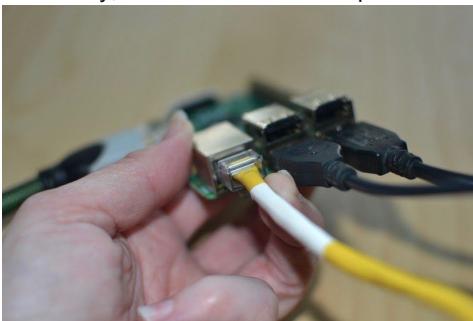
2. Plug the USB keyboard into one of the USB ports.
 3. Plug the USB mouse into one of the USB ports
- Alternatively, connect the Bluetooth adapter into one of the USB ports.



4. Turn on your monitor or TV set and make sure it is set to the proper input (e.g. HDMI 1 or Component).
5. Plug the HDMI or video component cable into the monitor or TV set.
6. Connect the other end of the cable into the Raspberry Pi.



7. Connect an ethernet cable to your router if you plan to connect to the Internet.
 8. Connect the other end of the cable to your Raspberry Pi.
- Alternately, connect the Wi-Fi adapter to the Raspberry Pi.



9. Connect the power supply to the Raspberry Pi.

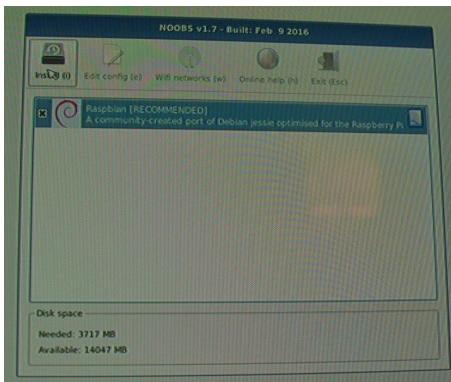
10. Plug the power supply into the power outlet. This will turn on and boot up Raspberry Pi. A power indicator light will begin to glow, letting you know that you are connected.



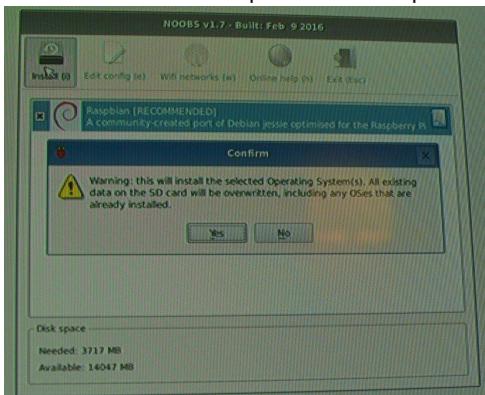
11. A start screen should appear on the monitor or TV you're using.

Download the Raspbian operating system on the Raspberry Pi

1. Select Raspbian.
2. Click Install.



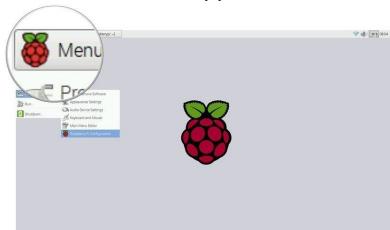
3. When the warning window pops up. Click Yes to confirm. This is just letting you know that the microSD card will be overwritten with an uncompressed version of the Raspbian operating system.
4. Wait for the installation process to complete.



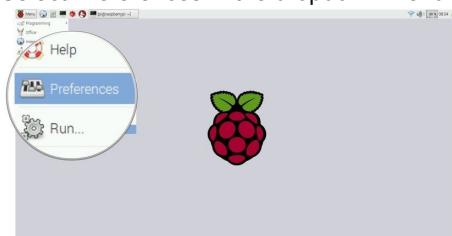
5. Once the installation process is finished, Raspbian will automatically begin to boot.

Configure your Raspberry Pi

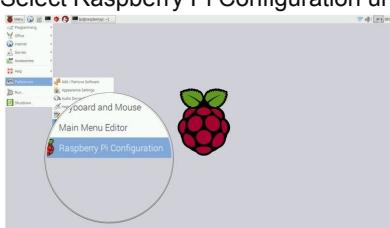
1. Click Menu in the upper left corner of the screen.



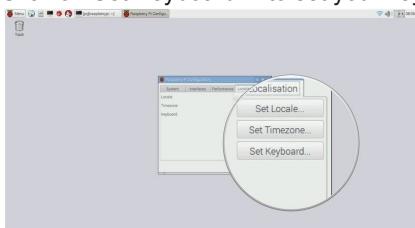
2. Select Preferences in the dropdown menu.



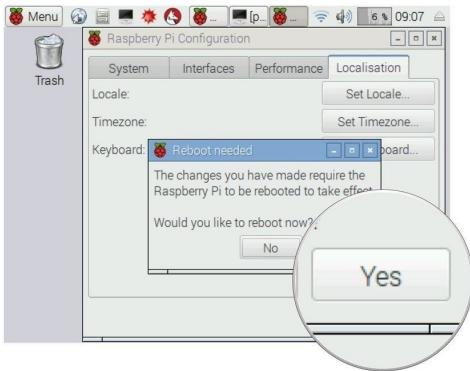
3. Select Raspberry Pi Configuration under Preferences.



4. When the configuration window appears, click on the Localisation tab.
5. Click on Set Locale... to set your location.
6. Click on Set timezone... to set your local time.
7. Click on Set Keyboard... to set your keyboard language.



8. Reconfiguring your Raspberry Pi will require a reboot. When the reboot window appears, click Yes to continue.



9.

You are set up and ready to start using Raspberry Pi.

LCD Touch Screen Module (\$20)

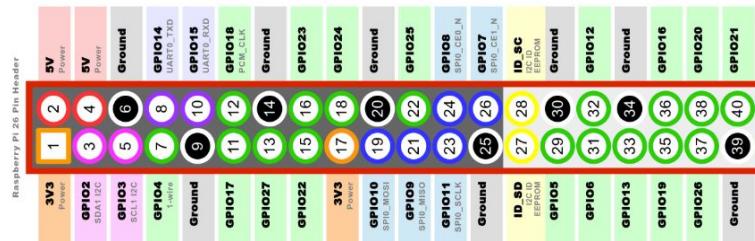
Package include:



1 x New 3.5" TFT LCD Touch Screen Module 320*480 RGB Display

1 x Pen

Display Screen Wiring

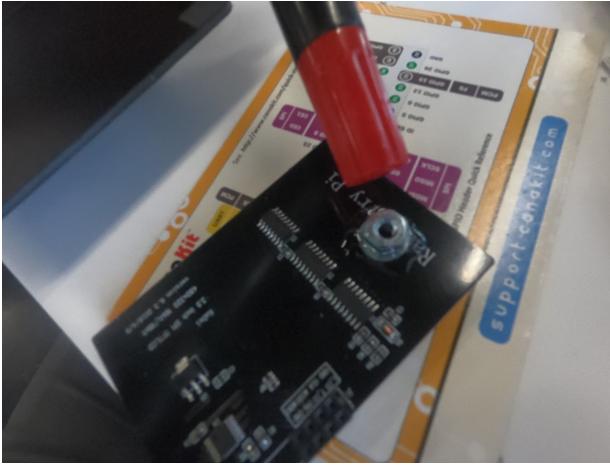




5v (right to left1) red wire - 5v
 5v (right to left2) orange wire - 5v
 Nc (right to left1) brown wire - 3.3v
 NC (right to left2) yellow wire -SDL GPIO 2

GND GREEN WIRE - GND 20
 MOSI BLUE WIRE - GIOP 10 (19) MOSI SPI
 IRQ PURPLE WIRE - GIOP 25 (22)
 MISO GREY WIRE - GIOP 9 (21) MISO SPI
 T_CS WHITE WIRE - GIOP 8 (24) CEO SPI
 CLK BLACK WIRE - GIOP 11 (23) SCLK SPI
 L_CS BROWN WIRE - GIOP 7 (26) CE1 SPI
 GND RED WIRE - GND 25

Retro fitted bolt to fasten to stand:



HOW TO USE?

Download link,en.kedei.net/raspberry/raspberry.html,copy to browser.
 a.Burn this files(**rpi_35_v6_3_stretch_kernel_4_15_18.rar**) to sd card.
 b.Use the driver in the network disk.

1. Burn your own image file to the SD card and start Raspberry Pi
2. Ensure that the network connection is ok.
3. Connect the LCD screen to the Raspberry Pi.

4. Copy the driver to the Raspberry Pi (use ssh or mount with U disk media)

5. Unzip the file and start the installation.

Modify permissions sudo chmod 777 LCD_show_v6_1_3.tar.gz

Extract the file tar -xvf LCD_show_v6_1_3.tar.gz

Jump into the folder cd LCD_show_v6_1_3

Upgrade the system first (optional) sudo apt-get update

Backup data sudo ./LCD_backup

Install the driver sudo ./LCD35_v

Wait a while, the system will install the driver and restart automatically.

Switch back to the HDMI interface sudo ./LCD_hdmi

If you want to back to the previous system, you can use sudo ./LCD_restore

Note: You must use this command: sudo apt-mark hold raspberrypi-kernel

(to lock the kernel and the driver is not changed) before you update the system.

Then use the command,

Sudo apt-get update

Sudo apt-get upgrade

Sudo apt-get dist-upgrade (This command is not recommended for upgrades, updates are new, but may be unsafe)

How to install / use the Raspberry Pi Camera (\$10)



IN THIS STEP BY STEP GUIDE WE WILL EXPLAIN HOW TO INSTALL THE RASPBERRY PI CAMERA MODULE, ALONG WITH HOW TO TAKE PICTURES/VIDEOS WITH IT.

1. Open up your Raspberry Pi Camera module. Be aware that the camera can be damaged by static electricity. Before removing the camera from its grey anti-static bag, make sure you have discharged yourself by touching an earthed object (e.g. a radiator or PC Chassis.)



2. Install the Raspberry Pi Camera module by inserting the cable into the Raspberry Pi. The cable slots into the connector situated between the Ethernet and HDMI ports, with the silver connectors facing the HDMI port.



3. Boot up your Raspberry Pi.

4. From the prompt, run "sudo raspi-config". If the "camera" option is not listed, you will need to run a few commands to update your Raspberry Pi. Run "sudo apt-get update" and "sudo apt-get upgrade"

```
pi@raspberrypi ~ $ sudo apt-get update
```

```
pi@raspberrypi ~ $ sudo apt-get upgrade
```

5. Run "sudo raspi-config" again - you should now see the "camera" option.



6. Navigate to the " camera " option, and enable it. Select “ Finish” and reboot your Raspberry Pi.



Retrofit pi camera to stand and plugging camera cable :



HOW TO TAKE A PHOTO WITH YOUR RASPBERRY PI CAMERA MODULE

1. "raspistill" is a command line application that allows you to capture images with your camera module. Below is an example of this command in use.

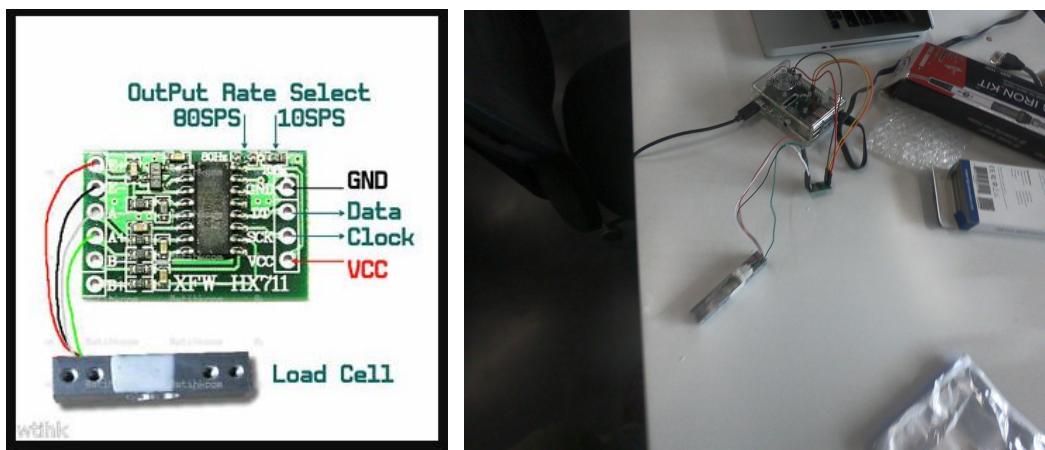
2. To capture an image in jpeg format, type "raspistill -o image.jpg" at the prompt, where "image" is the name of your image

HOW TO RECORD A VIDEO WITH YOUR RASPBERRY PI CAMERA MODULE

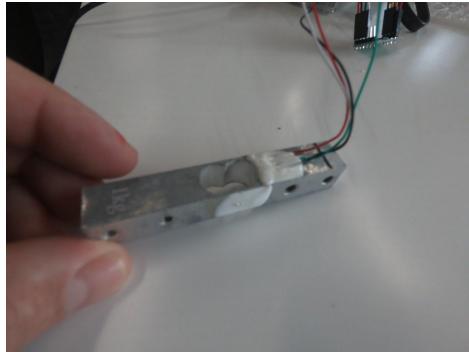
1. "raspivid" is a command line application that allows you to capture video with your camera module. Below is an example of this command in use.

2. To capture a 10 second video with your Raspberry Pi camera module, run "raspivid -o video.h264 -t 10000" at the prompt, where "video" is the name of your video and "10000" is the number of milliseconds

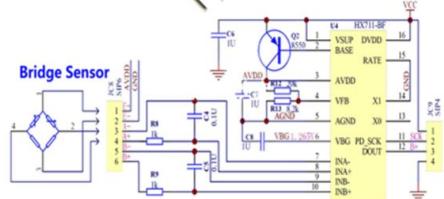
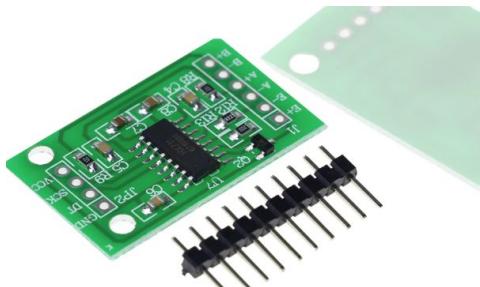
How to install Load cell (\$5) and HX711 (\$5)



1kg Load Cell:



HX711:



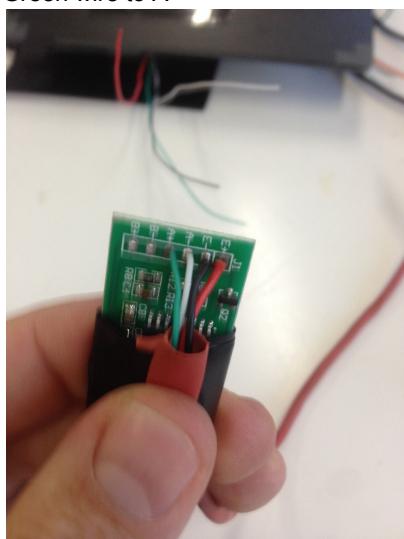
Wire load cell to HX711:

Red wire to E+

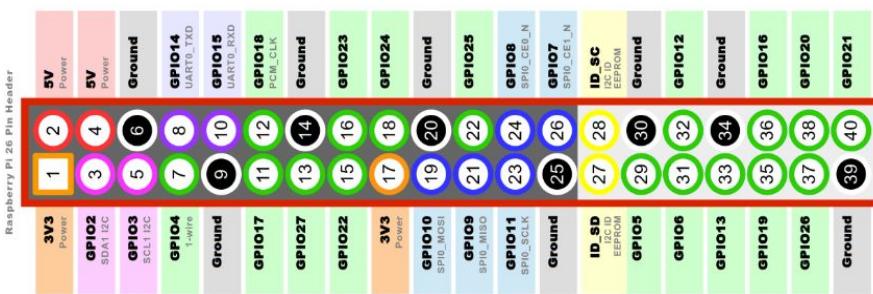
Black wire to E-

White Wire to A-

Green wire to A+

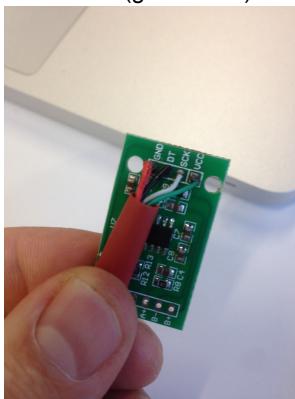


Wire HX711 to Raspberry Pi:

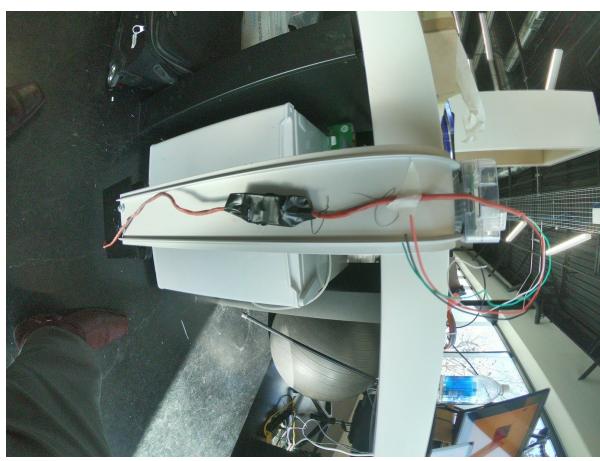
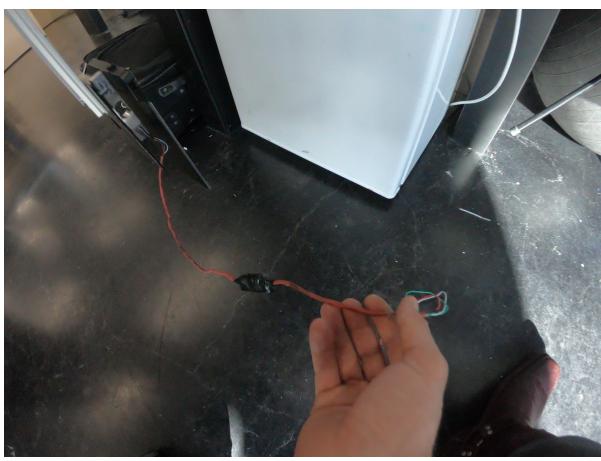
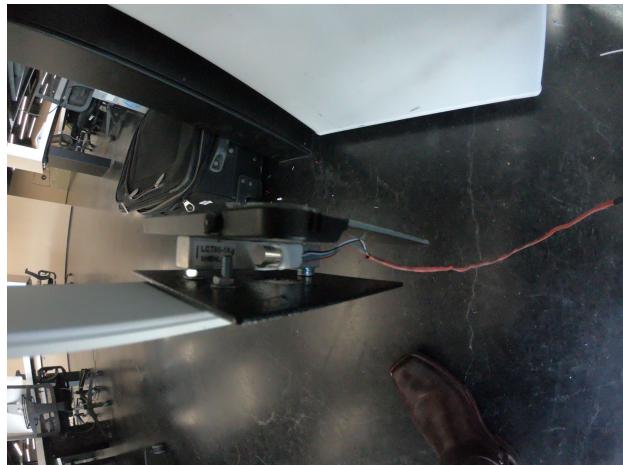
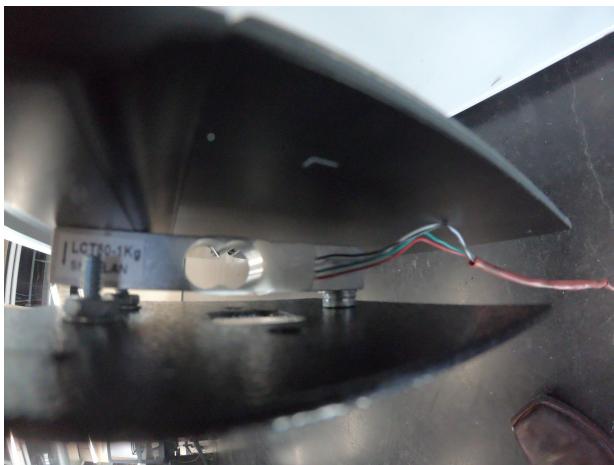


Gnd to Gnd (red wire)

DT to pin 29(GPIO 5) (black wire)
SCK - pin 31 (GPIO 6) (white wire)
VCC - 3.3v (green wire)



Retro Fitted Scrap parts to emulate a scale :



Final Assembly of all the parts onto the frame:

Scale with water bottle complete:



Back of the unit , Raspberry and camera mount with neater wire connections:

