What is the Documentation Station?

Have a paragraph with some of the background here from Parlay documentation. I will create a separate document explaining more thoroughly the applications and its best recommended uses.

The documentation station is a small convenient box that contains a raspberry pi, a camera, a button, and a monitor. It is able to capture the students working simply by pushing the button. This will allow for the teacher to be able to monitor their students work and their progress without having to constantly check on everyone. In a classroom setting, this makes it so that the teacher is able to monitor his/her students' work where in most cases it is not possible due to the ratio of students per teacher.   This product is also geared toward other fields where documentation is vital in conveying progress and ideas. By implementing the documentation station, it will be easier for researchers in a lab setting as well as other fields to record work progress to purpose later.

What you will need:
- Raspberry Pi (we used B+)(for wifi purposes the 3 is recommended)
- MicroUSB to power cable (to power the pi)
- HDMI to HDMI cable
- USB to power
- Adafruit 7inch LCD Touchscreen (works out of the box as opposed to Sainsmart's 7inch Touchscreen)
- Big green pushbutton
- Small push button
- 4 male to female jumper wires
- Bread board
- USB Hub with power adapter (If you opt to use a large computer sized monitor instead of the 7 inch screen, this isn't needed. The 7 inch screen just requires more power than the pi can provide.)
- Laser cut box (If you're short on wood or laser cutters, any casing should work just as long as the wires aren't exposed much and the students only have access to the big green push button. I used a case out of LEGOs for prototyping, for instance)

  For set-up only:
- Mouse
- Keyboard
- Ethernet cable

Step 1: Get your pi up and running

Use this setup tutorial https://www.raspberrypi.org/help/noobs-setup/ and download noobs on https://www.raspberrypi.org/downloads/noobs/. After this the raspberry pi should be setup with the correct operating system.

(please point to the proper tutorial or website to get it up and running)

Step 2: Mount USB drive

Follow tutorial to mount the usb drive successfully from startup without having to worry about setup each time.

http://www.modmypi.com/blog/how-to-mount-an-external-hard-drive-on-the-raspberry-pi-raspian

Be mindful of spaces and sometimes the 'L's look like ones and vice versa. Also when checking the type of file using "sudo blkid" make note of the four letter type in quotation marks and use that in the last part when editing the etc/fstab folder. If the type for the USB is "vfat" then when following the link above, it is necessary to type "defaults, umask=000", instead of"defaults". Once the usb is mounted and connected, go to the documents folder and find out where the usb is located, it should be under "/mnt". Also note that the usb should be plugged into the same port each time. Once this is the case, make note of this for the next step.

Step 3: Update and get the pi

Install necessary packages and edit necessary files so you can use camera tools...see the start of that webcam tutorial . Download the doc_jun20.py file and the doc_start_up file from github. Make sure to edit the doc_start_up file to make sure the line "python/home/pi/python_games/Doc/doc_jun20.py" matches whichever file path you chose to save doc_jun20.py. **Finally, edit the python script that you downloaded and go to line 101 and set the *filename = "/mnt/image_%s.jpg" % 1*; most of that should be typed you can just change the part inside the quotation marks.**

Step 4: Wiring the buttons (can include in set-up instead if preferred)

Attach the large button to the father(pointy) ends of the wire. (See image 3), One attaches to the right plug and the other goes to the side metal clip. Then attach the small button onto the breadboard specifically on columns "e" and "h". Next, take two of the four wires and attach the father end(pointy) in column "c"; they should be aligned in the same row numbers as the metal parts of the button. After the buttons and father ends are attached use the diagram below to attach the mother ends. For button one attach the mother end of the wire on the lower row of the breadboard to GPIO16. Attach the mother end of the other wire to one of the black pins indicated by the diagram(try not to use the one next to GPIO 16). For the next button do that same thing attaching the lower wires mother end to GPIO 13 and the other one to a black pin(also not the one next to GPIO 13). The buttons should now be set up and ready to use.
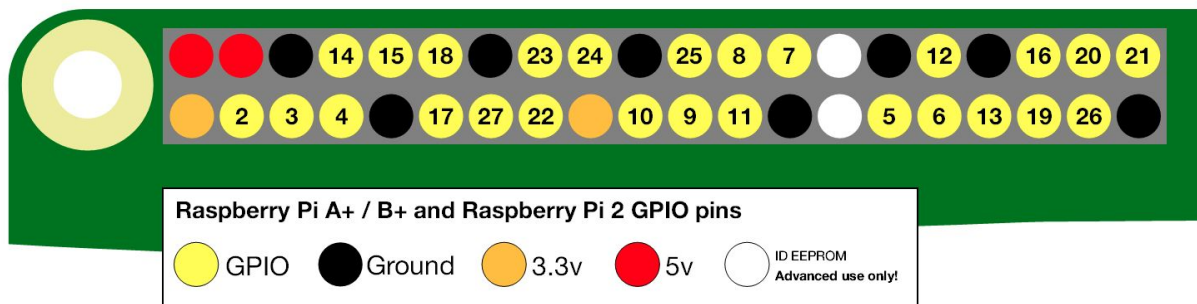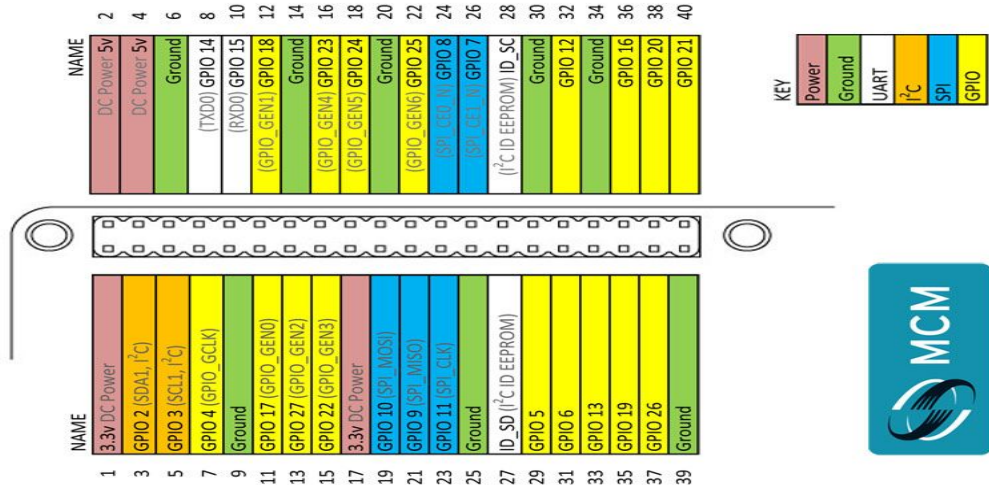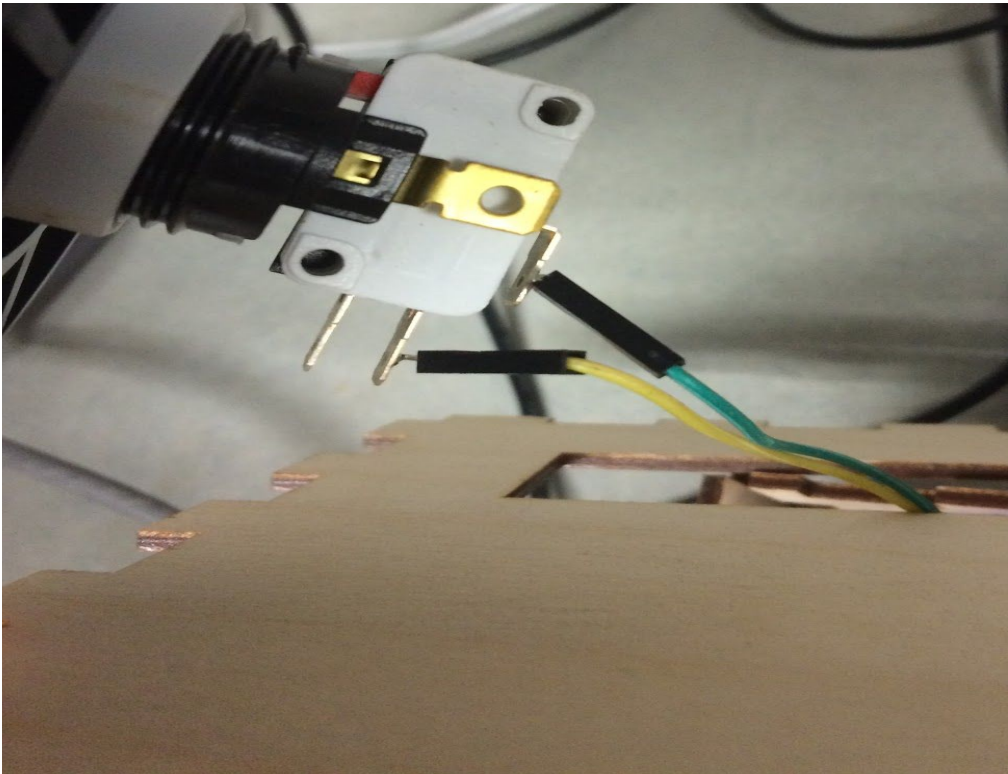
Image 1(above)

Raspberry Pi 3 GPIO Pin Layout

MCM

NAME	Pin
DC Power 5v	2
DC Power 5v	4
Ground	6
(TXD0) GPIO 14	8
(RXD0) GPIO 15	10
(GPIO_GEN1) GPIO 18	12
Ground	14
(GPIO_GEN4) GPIO 23	16
(GPIO_GEN5) GPIO 24	18
Ground	20
(GPIO_GEN6) GPIO 25	22
(SPI_CE0_N) GPIO 8	24
(SPI_CE1_N) GPIO 7	26
(I²C ID EEPROM) ID_SC	28
Ground	30
GPIO 12	32
Ground	34
GPIO 16	36
GPIO 20	38
GPIO 21	40

Pin	NAME
1	3.3v DC Power
3	GPIO 2 (SDA1, I²C)
5	GPIO 3 (SCL1, I²C)
7	GPIO 4 (GPIO_GCLK)
9	Ground
11	GPIO 17 (GPIO_GEN0)
13	GPIO 27 (GPIO_GEN2)
15	GPIO 22 (GPIO_GEN3)
17	3.3v DC Power
19	GPIO 10 (SPI_MOSI)
21	GPIO 9 (SPI_MISO)
23	GPIO 11 (SPI_CLK)
25	Ground
27	ID_SD (I²C ID EEPROM)
29	GPIO 5
31	GPIO 6
33	GPIO 13
35	GPIO 19
37	GPIO 26
39	Ground

KEY: Power | Ground | UART | I²C | SPI | GPIO

Image 2 (above)
Image 3(below)

Step 5: The casing/housing

Up until now the raspberry pi has been setup without a casing or anything. But for the safety of the students and to make it more aesthetically pleasing a casing should be made. A protective case for this documentation station was made out of laser cut wood. First, create a design for

the case on Adobe Illustrator. The housing used for this design consists of six flat pieces that fit together like a puzzle box. The Illustrator template for this casing is available for download in the link below. However, in most cases a laser cutter will not be convenient so some recommendations would be to cut up an old shoe box or something of that size. There will need to be approximately six holes. One for the usb to plug into the monitor/lcd. Another one for the raspberry pi to plug into the outlet and then two, one for each button. Also although the mouse and keyboard will not be used with the students, it will be needed to setup so two holes for the mouse and keyboard could be used in case changes to the actual code or typing are needed.

Step 6: Run! (or other stuff if you think I forgot anything)

Optional: Setting up a USB wifi dongle
To get wifi access with a USB dongle follow the instructions in the manual below:

http://www.jeffgeerling.com/blogs/jeff-geerling/edimax-ew-7811un-tenda-w311mi-wifi-raspberry-pi