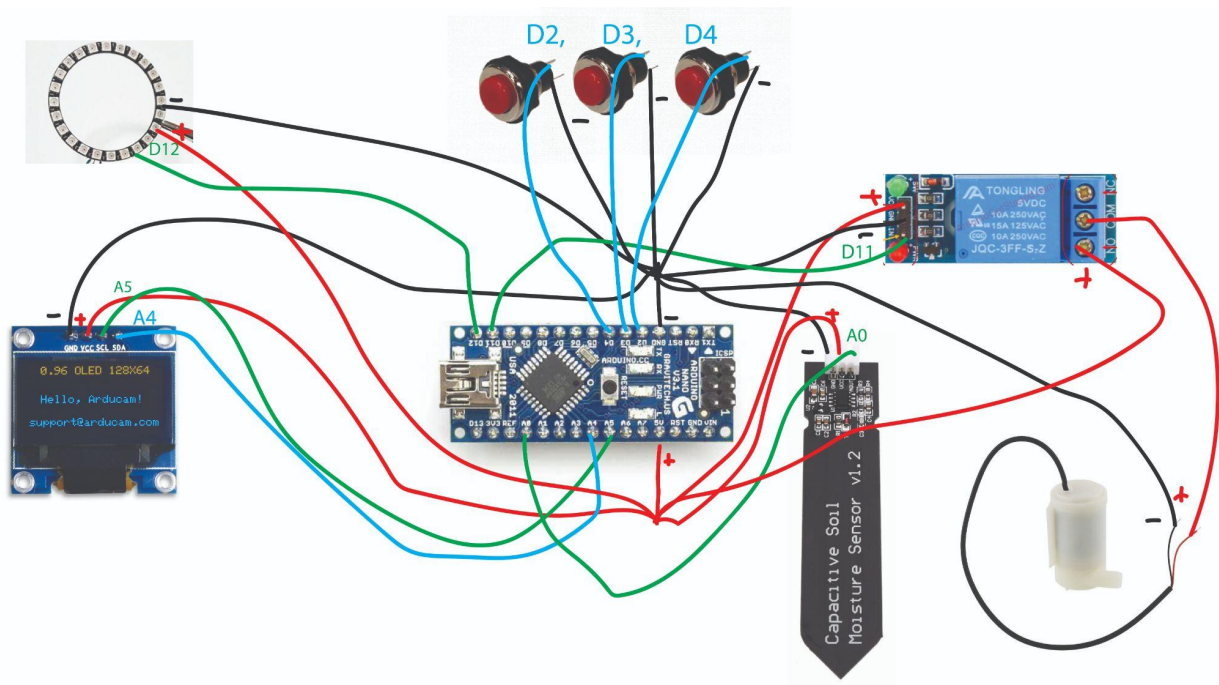


Saibamaze October 2020
Self Tending Garden Instruction Guide

PARTS

1. Hot Glue
2. Captive Soil Moisture Sensor
3. SSD1306 OLED I2C Screen
4. 3x push buttons
5. 3v-5v DC Water Pump
6. Relay switch
7. Arduino ring LED light
8. Arduino nano
9. 3D Printer
10. Spare wire
11. Tubing for pump

CIRCUIT

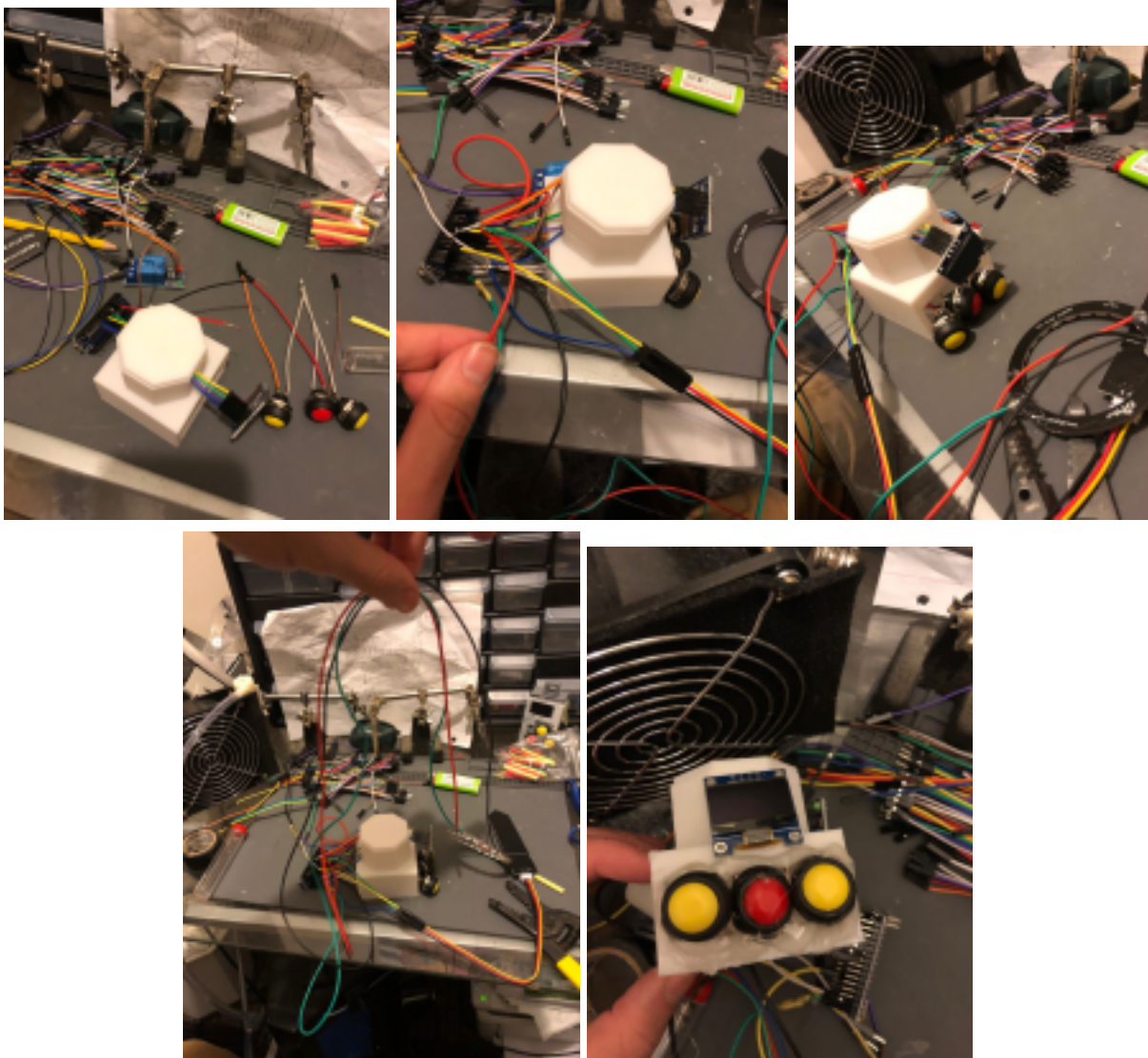


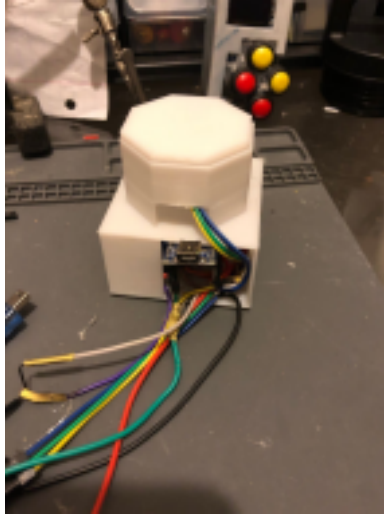
STEP 1

Construct the circuit using a breadboard to make sure all your components work.

STEP 2

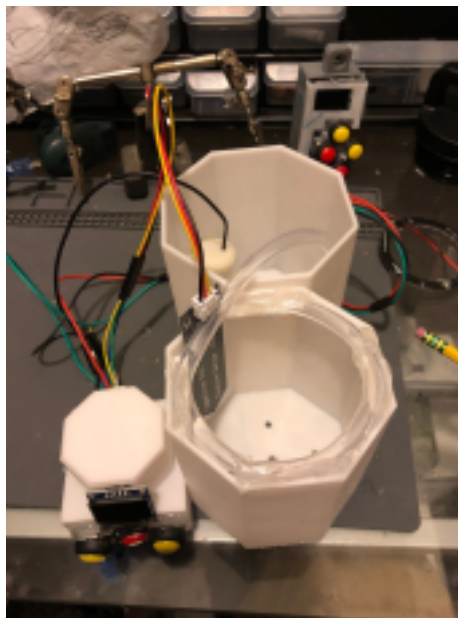
Print the 3D parts and construct in a manner similar to the photos below. There is no correct or specific way to do this. Things to keep in mind: Use long wire (9+ inches) to connect the ring light, as it will be far from the arduino housing component. The small square with the octagonal structure will be the arduino housing component. The top front slit is used for the screen, and the bottom front slit is used for the buttons. Use lots of hot glue to keep them in place. Once the circuit is soldered, insert the relay switch into the housing first, and then the nano second (so the USB can be freely accessed).





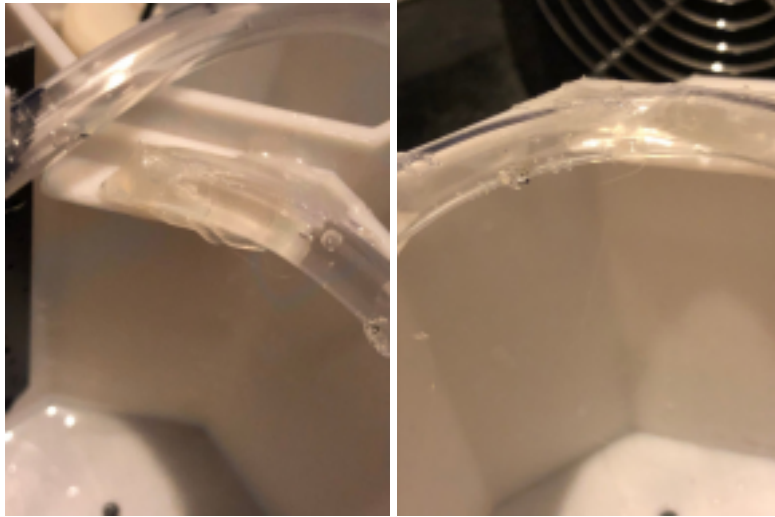
STEP 3

Hot glue the planter and water reservoir together as shown below. The difference between the two is, the water reservoir is slightly taller and has no drainage holes at the bottom. Then glue the electronic component housing the left side of the planter. After gluing those three components together, glue the water pump tubing to the rim of the planter, having it rest on the extrusions for support.



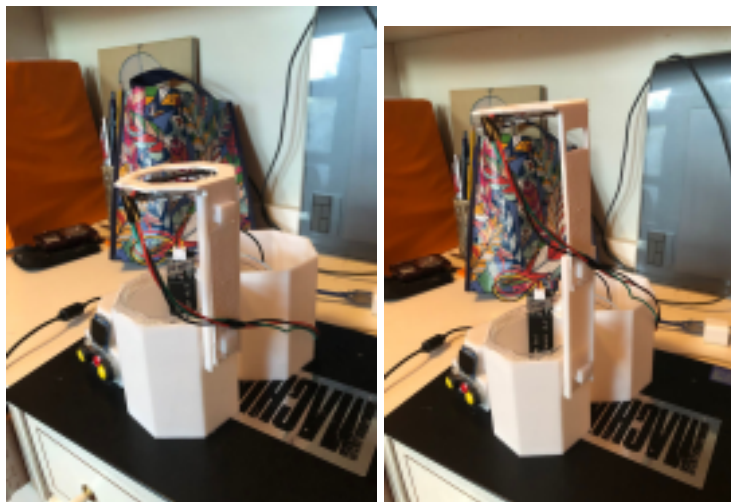
STEP 4

Glue the end of the tubing shut so no water can escape. Then, heat up a needle or metal rod of some sort to poke small holes along the inside of the tubing, so when water is pumped through it disperses evenly throughout the soil.



STEP 5

Print the lamp housing and stand and glue to the right side of the planter. Glue the ring LED light to the octagonal part of the lamp housing. You will notice that there are two positions the light can be placed in, close to the soil and farther away. This allows for seedlings to get proper light, absorbing as much as possible, and once your plant grows tall enough you can adjust the height of the light to properly disperse.



STEP 6

I noticed that when I used and tested my build, PLA plastic is NOT watertight, and it started to leak.. So, for the water reservoir, I added a plastic bag with a rubber band around the edge to contain the water. This is optional, and only if your build isn't watertight.



USAGE

1. Mix soil with water to desired amount of moistness, this depends on the type of plant you want to grow.
2. Insert the moist soil into the planter and turn it on.
3. Note the moisture level the sensor is reading. A higher number means it is dry, a lower number means its more moist. (Around 200 for completely submerged and 550 for air-dry).
4. Use the left and right buttons to adjust the threshold level. The threshold is the level that when passed, it will water the soil. Since a higher number on the sensor means more dry, as the soil dries out, the number the sensor reads will increase. Once it passes the threshold, it will water the planter. You will want to put your threshold to the current moisture level of the desired soil +50 to +100. This is because if you put your threshold to the exact amount its reading now, it will most likely over water. If you have a succulent however that requires little watering, maybe add +150 to the current moisture reading, as this means the soil will be dryer for a longer period of time before it self waters.
5. Add water to the water reservoir.
6. Press the middle button to enter the growing mode where it will self water. The light will turn on and stay on for 24 hours, as artificial light needs to be on longer because it doesnt provide the full light of the sun.
7. If you notice your soil is too dry or too wet, you can press the middle button again to exit grow mode and adjust the threshold.
8. Once your plant is big enough, adjust the light as shown in STEP 5 to adapt to the current height of the plant.



ENJOY!