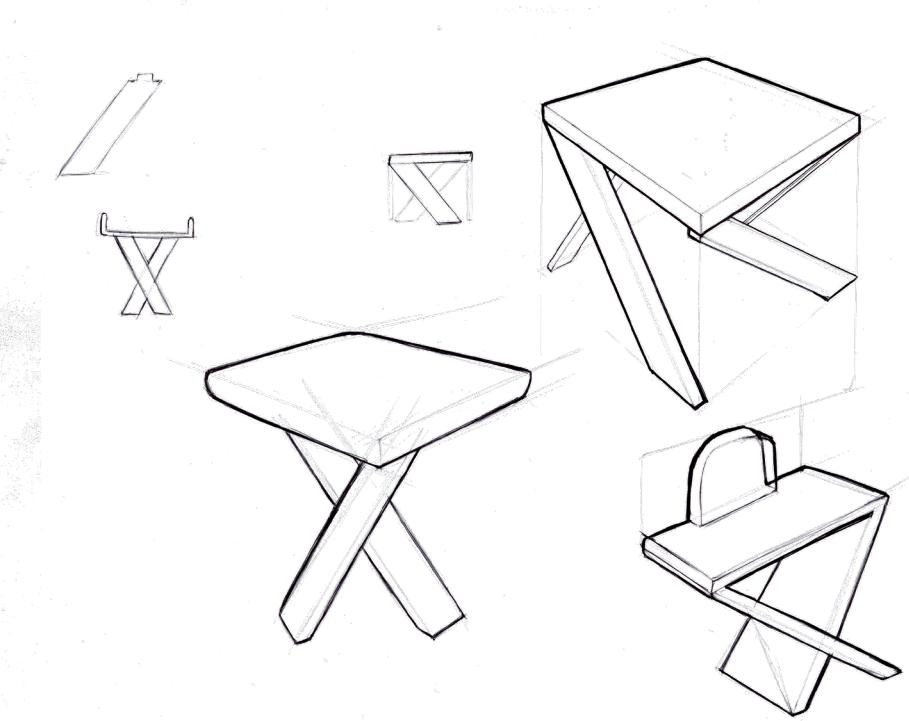
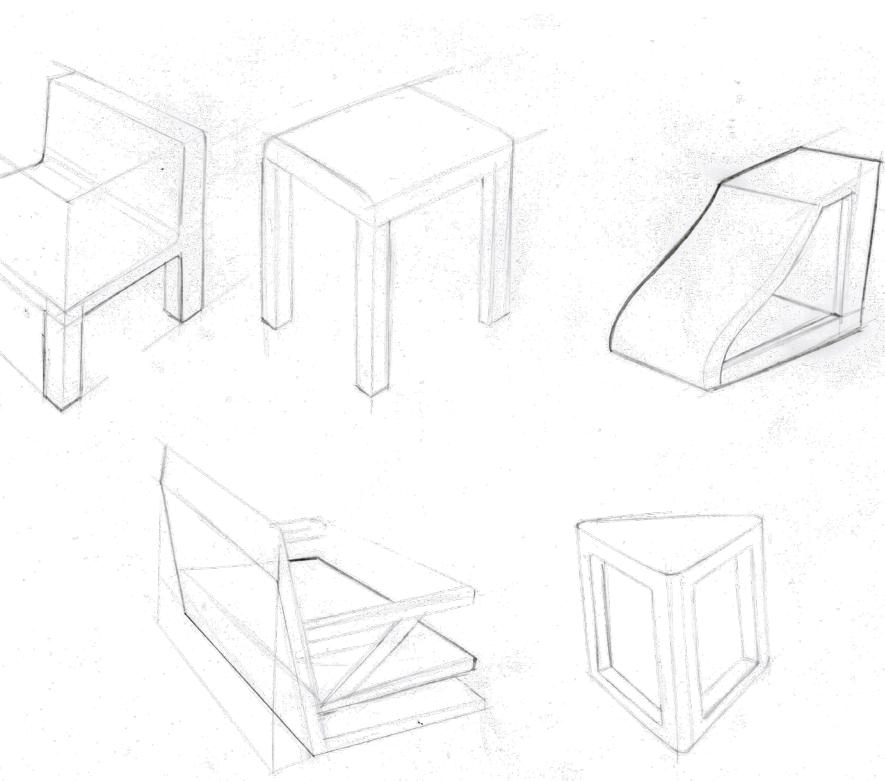
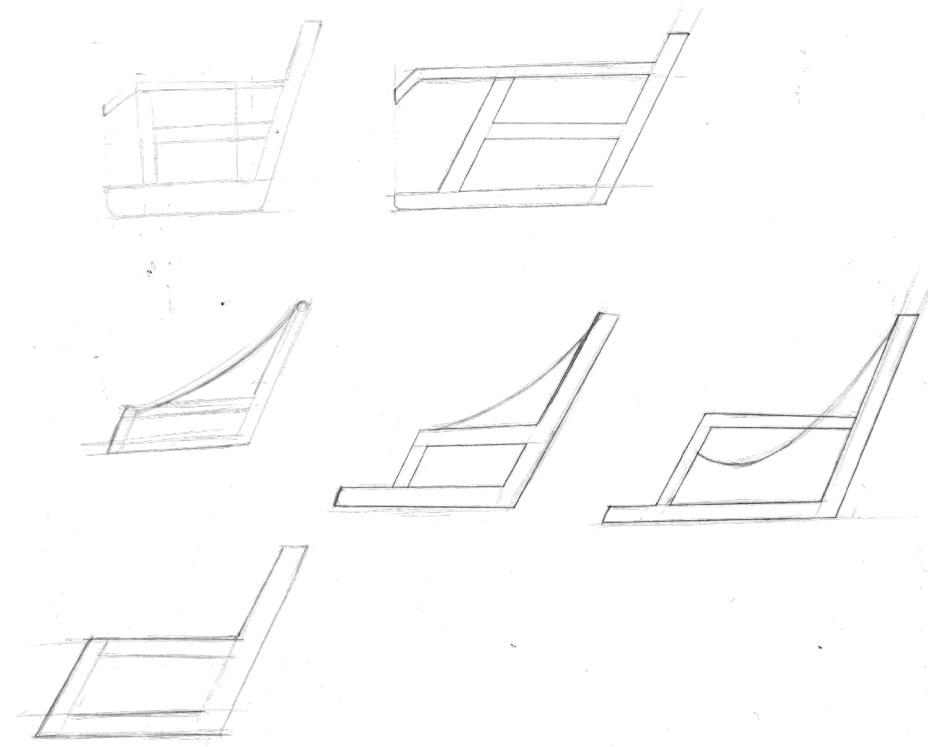
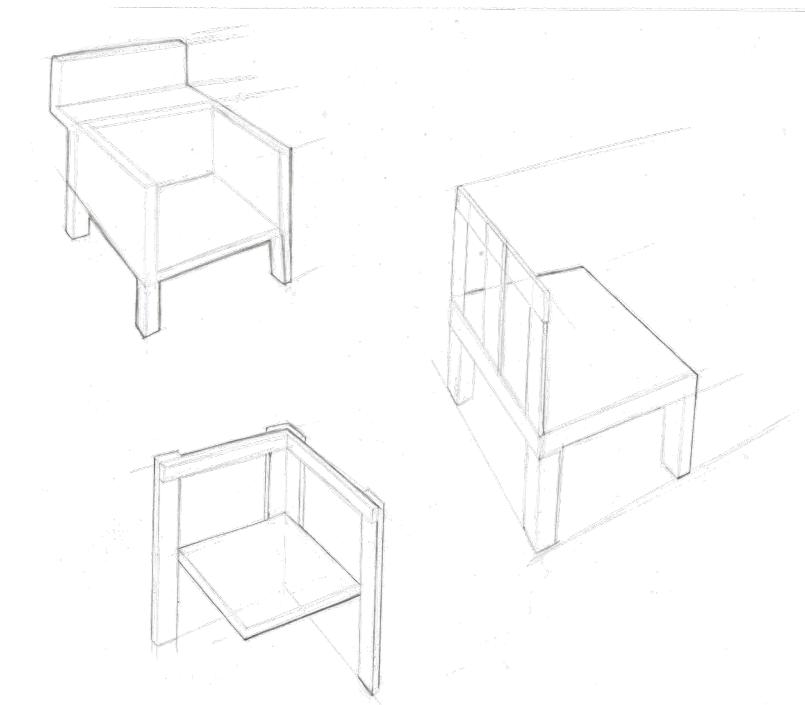
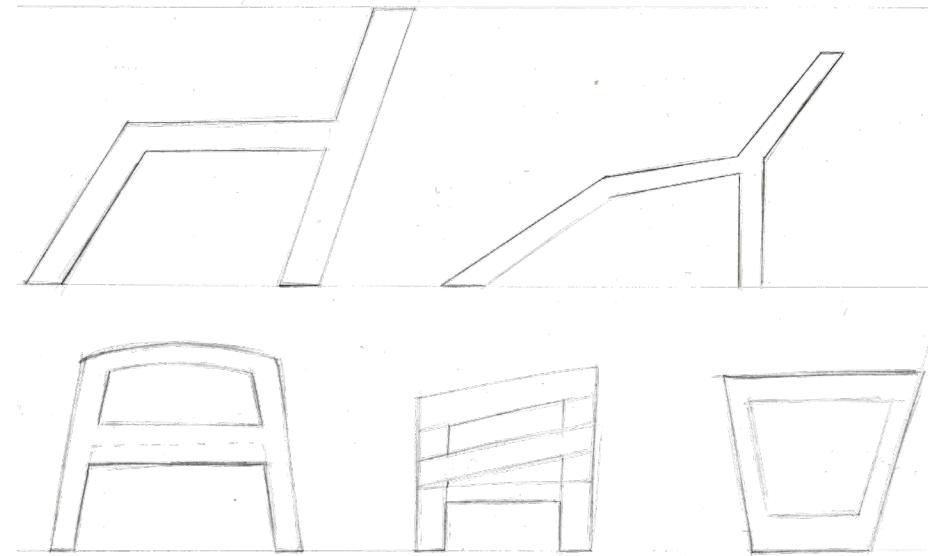


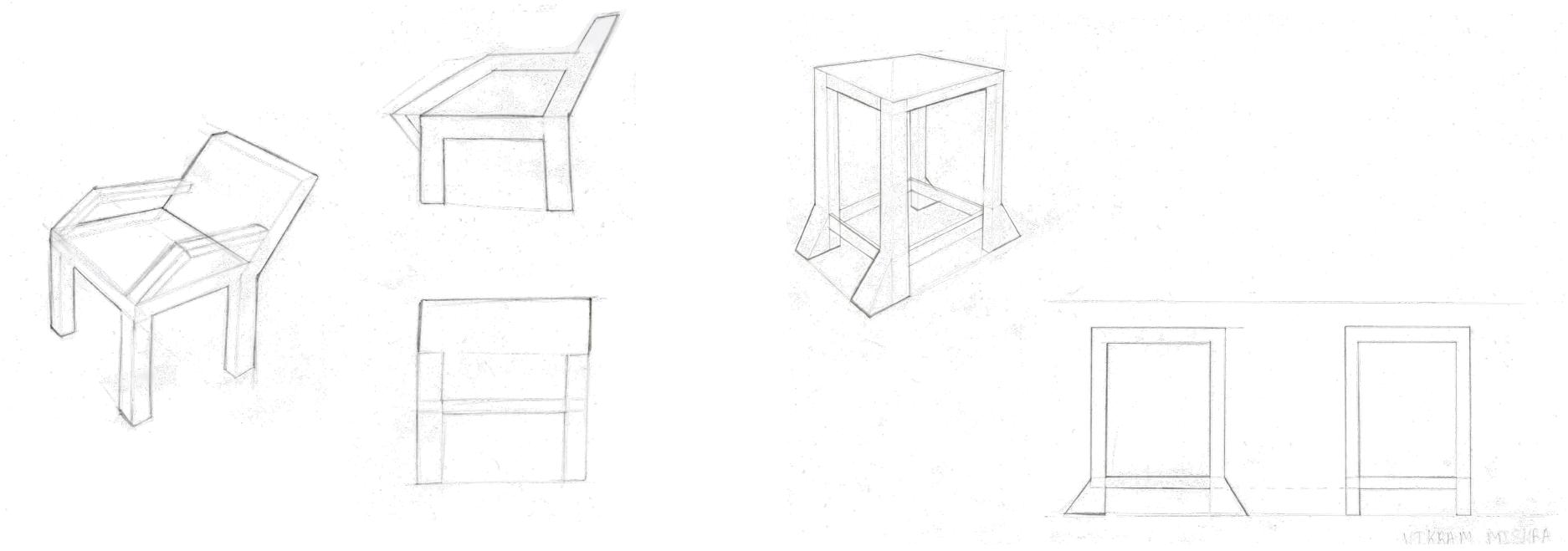
Stool

By Vikram Mishra

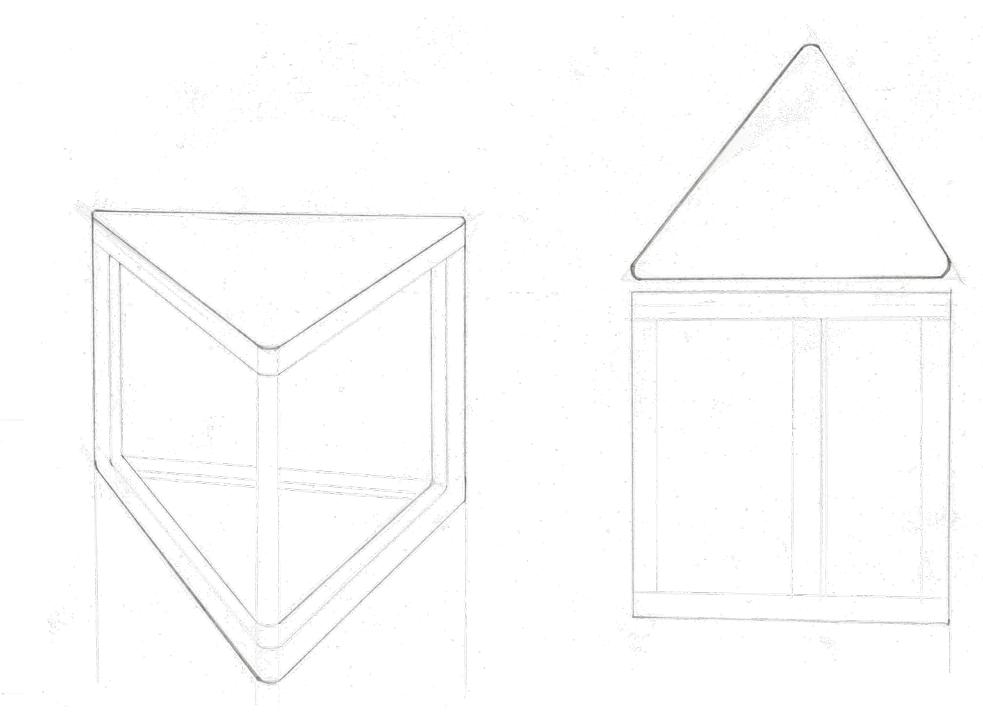
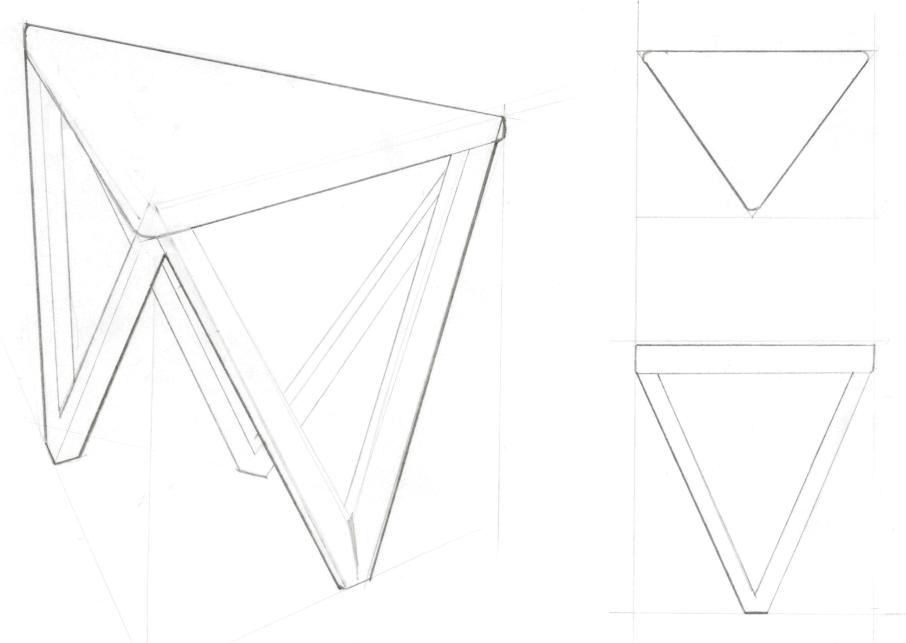
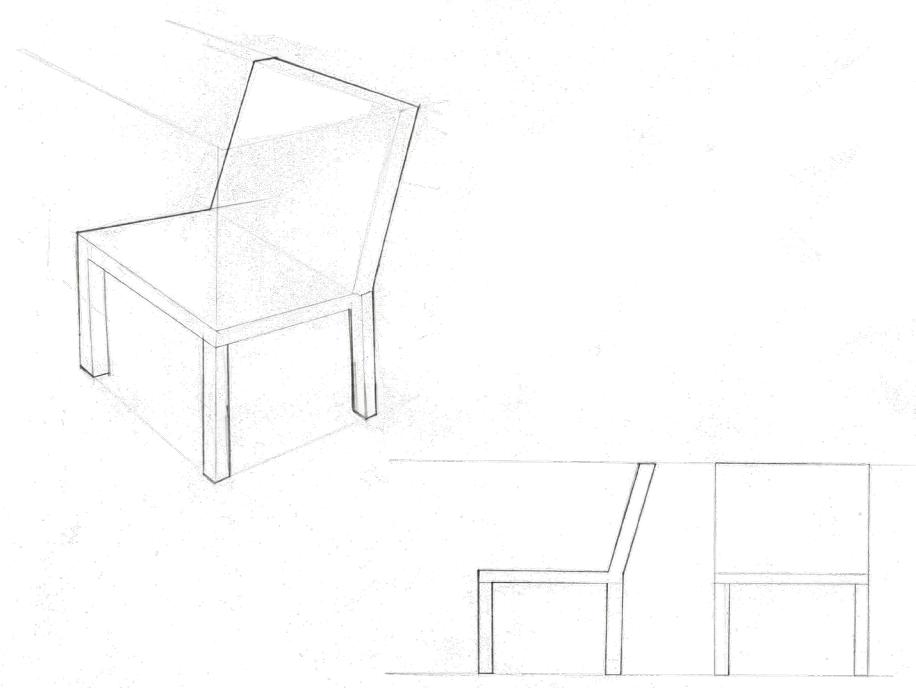
Ideation



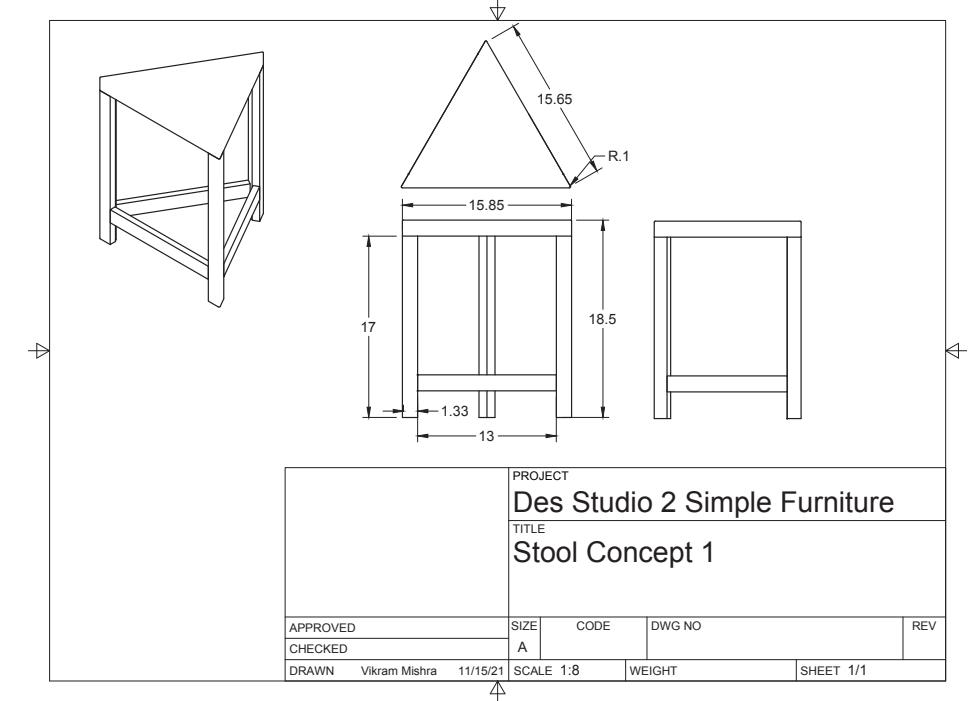
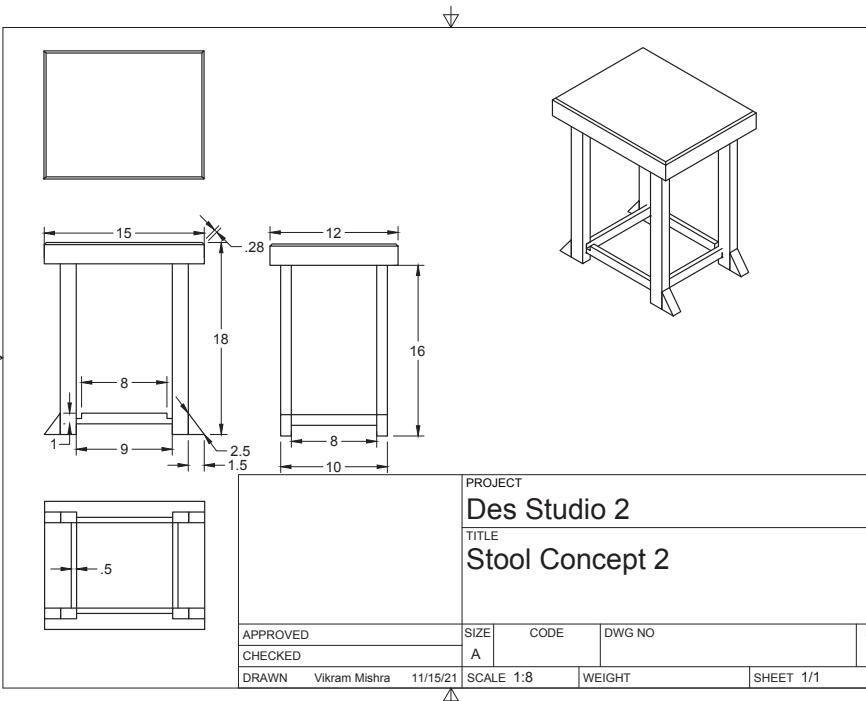
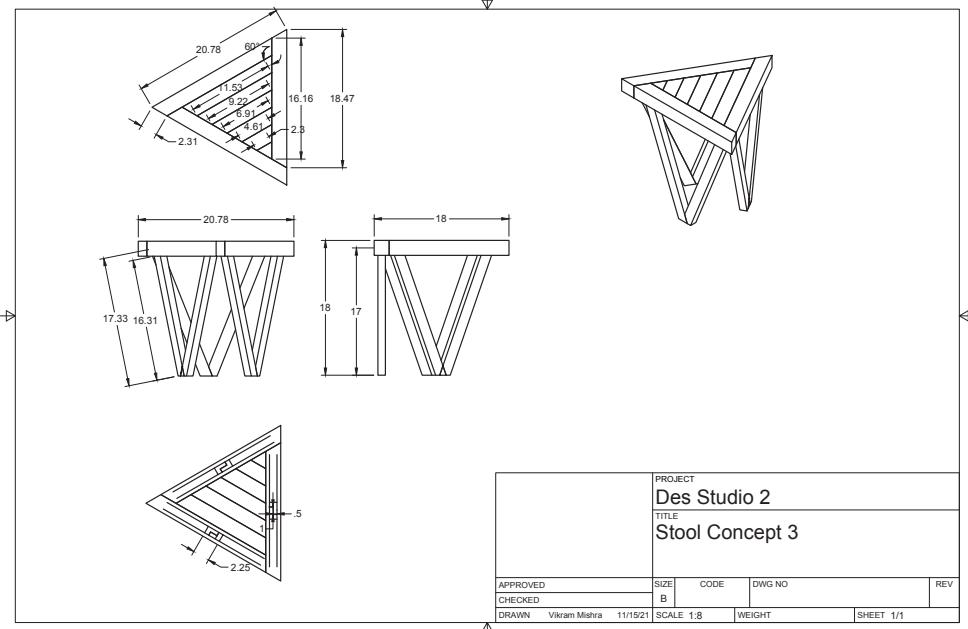
Concept Sketches



VTKRAM MISRA



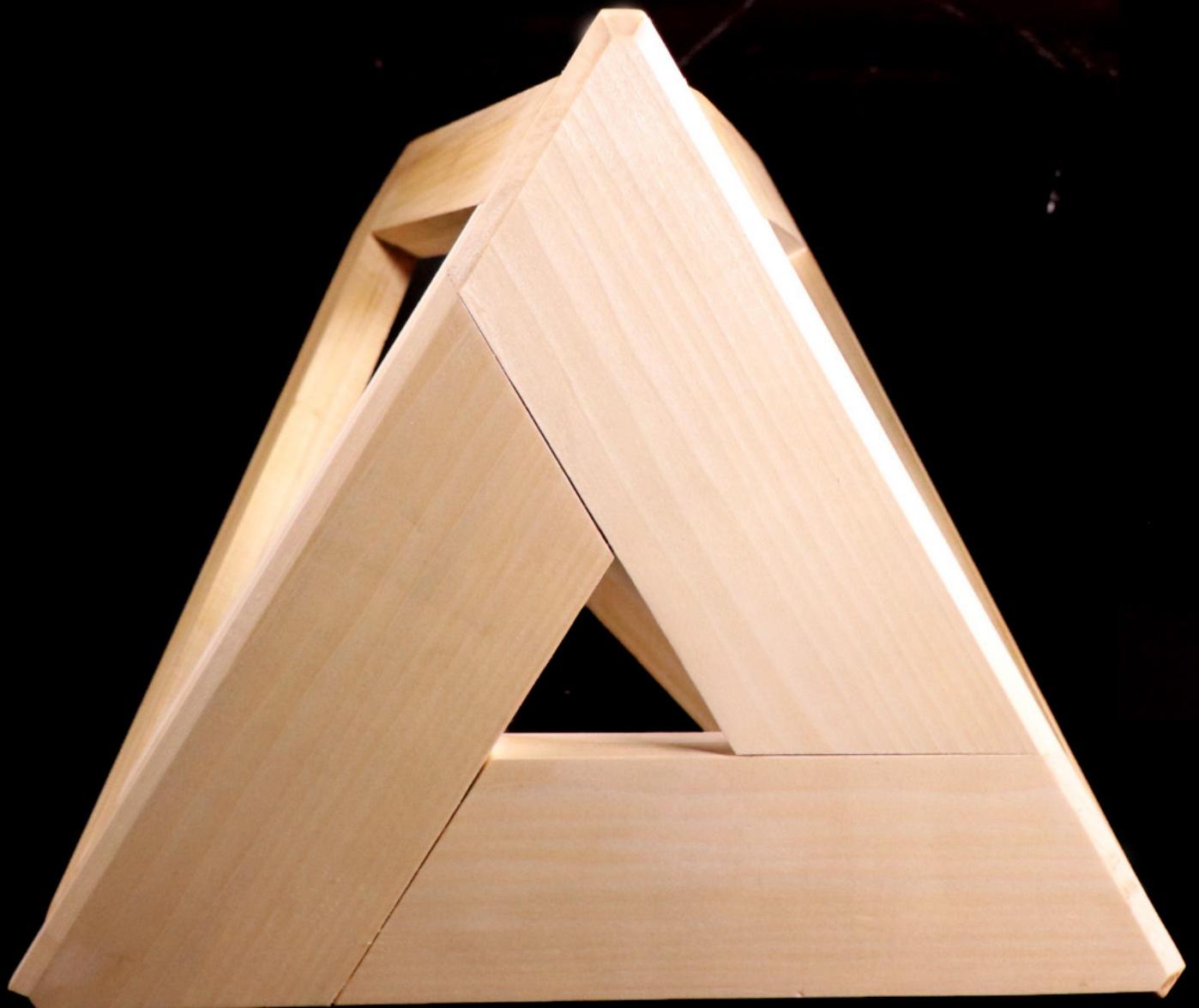
Design Concepts



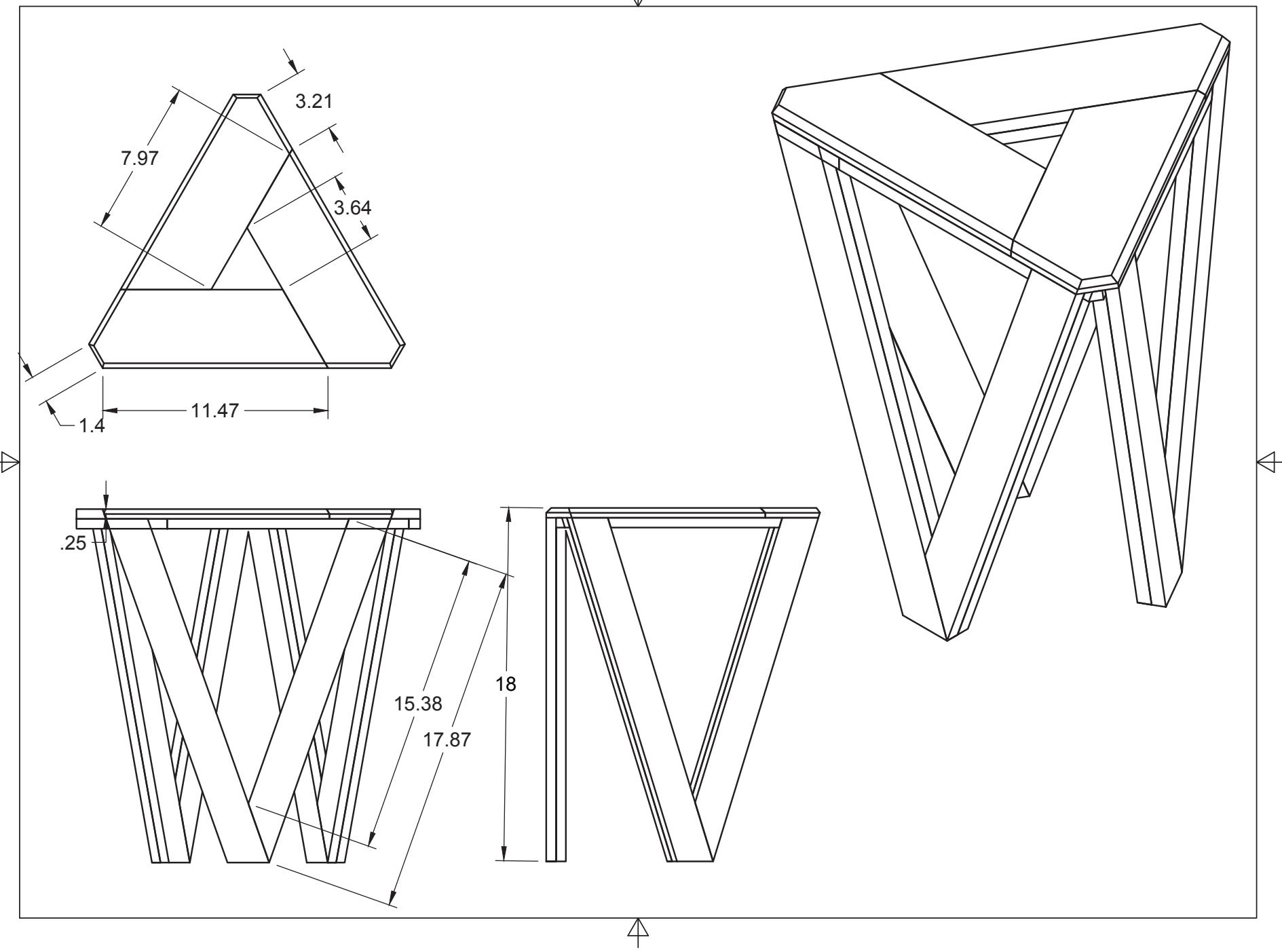
Full Scale Prototype



The Δ Stool



Construction



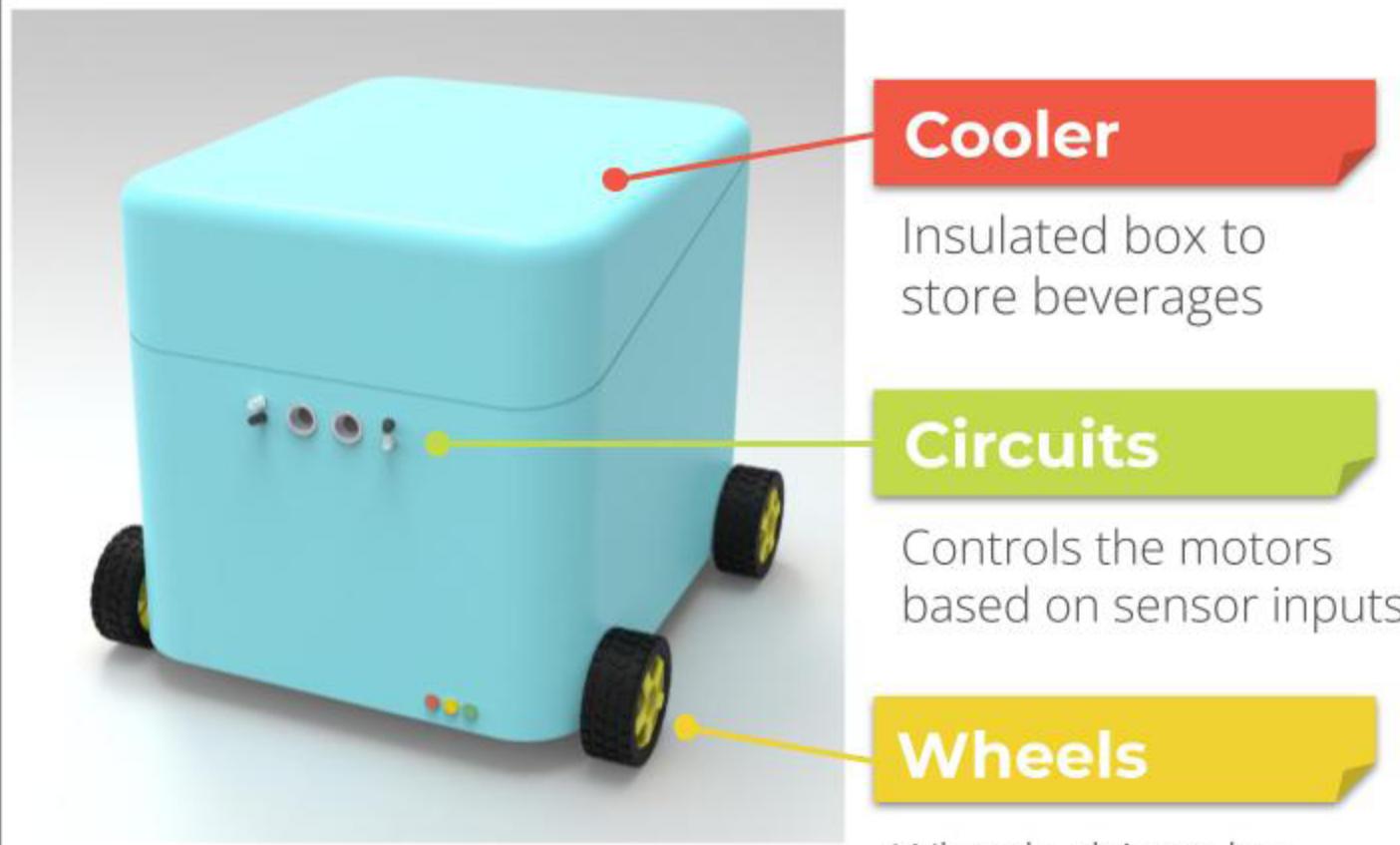
Thank You



The Cooler Robot



Product Architecture



A robot to perform the simple task of keeping drinks cool anywhere, at any time. This robot will follow the user while keeping beverage cans in a temperature controlled storage space.

Cooler

Insulated box to store beverages

Circuits

Controls the motors based on sensor inputs

Wheels

Wheels driven by motors to move the robot around

Activity Analysis

The product will mostly be used outdoors during the summer on days when people are outdoors. It can be used for small groups of people or individuals.

1. Obtain Beverages

2. Open lid

5. Switch on robot

6. Select robot mode

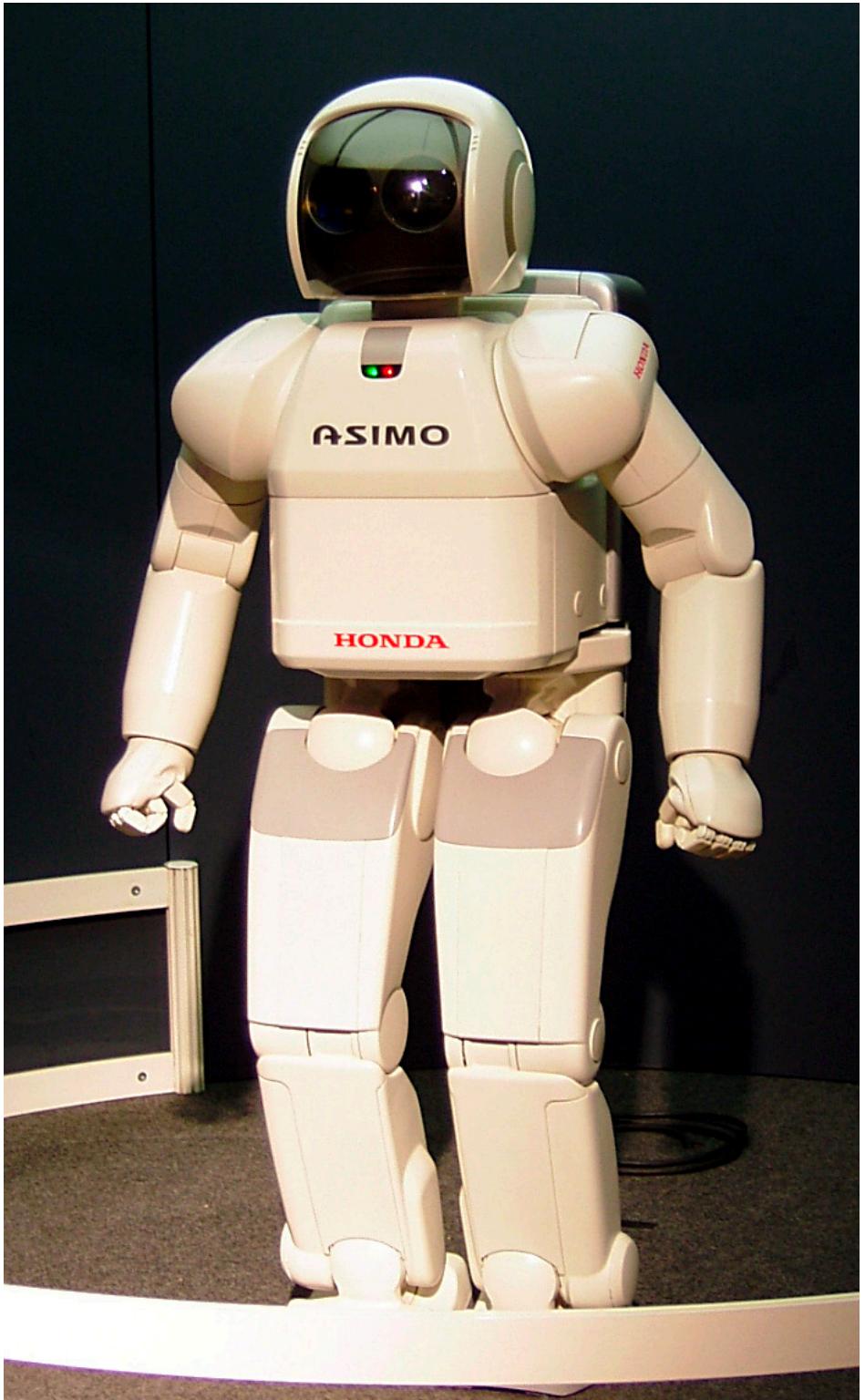
3. Place Beverage(s)

4. Close lid

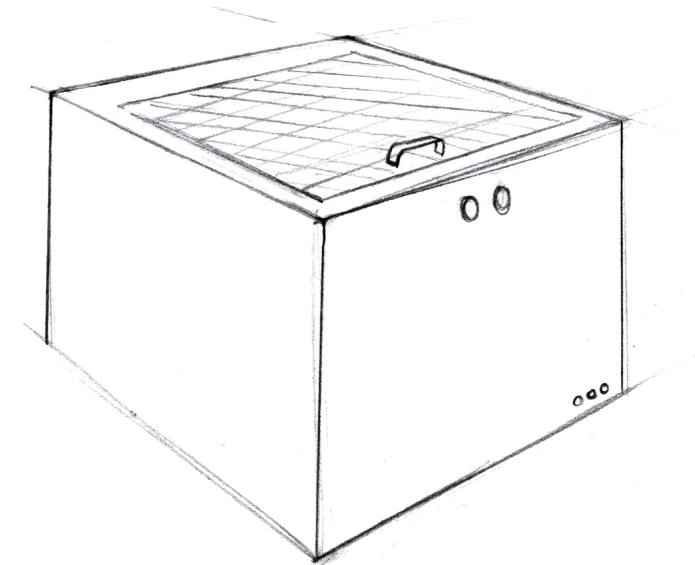
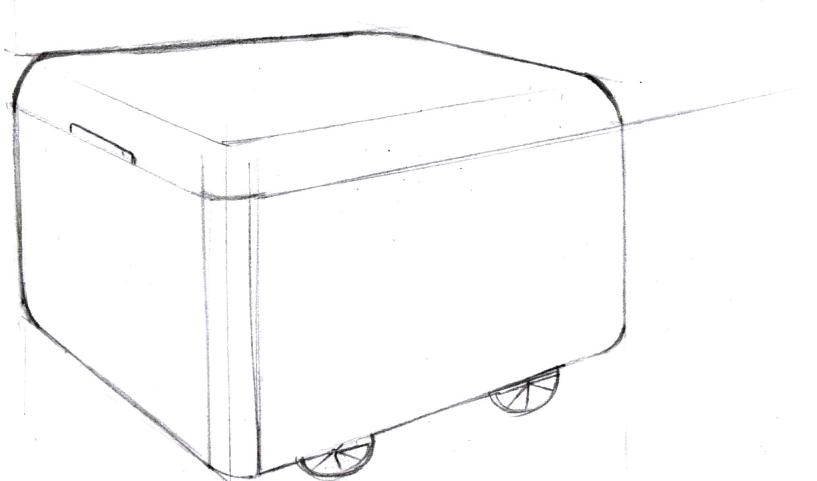
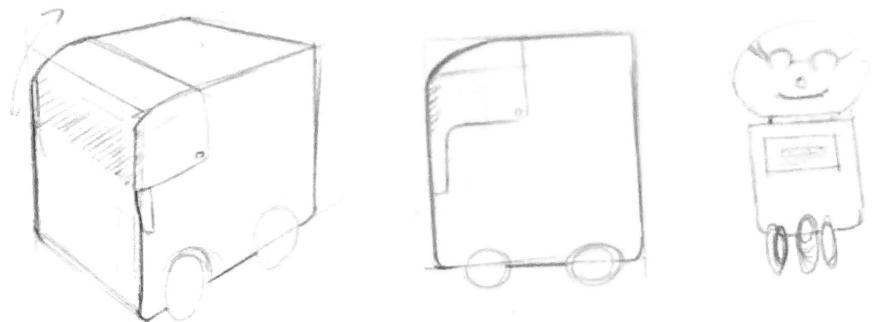
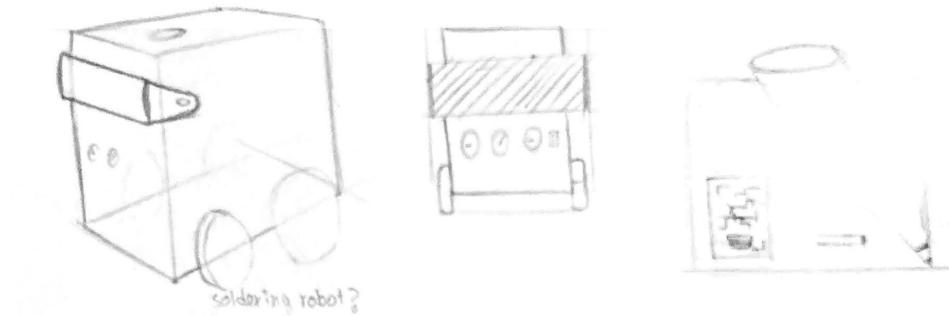
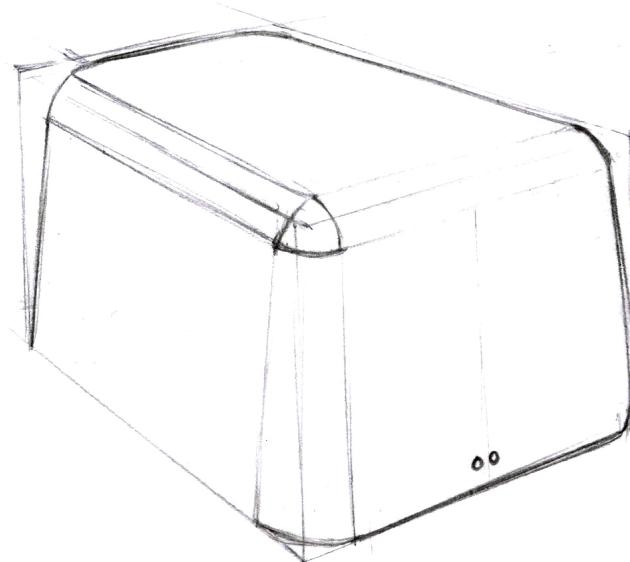
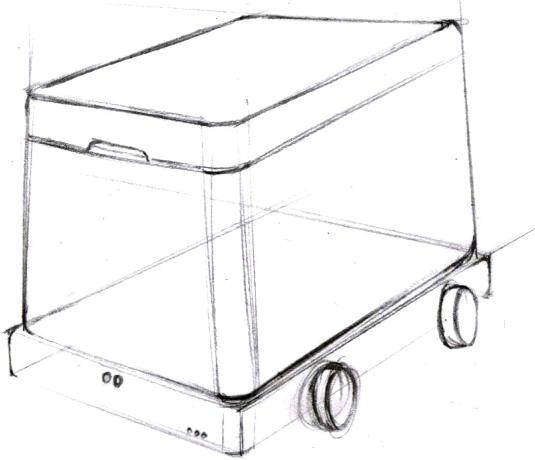
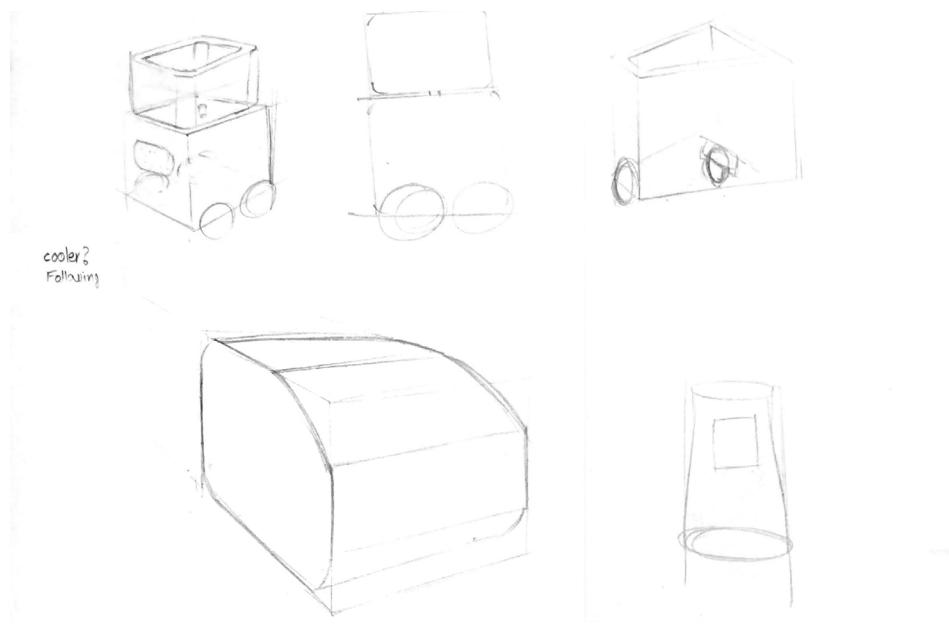
7. Switch off robot

8. Clean robot and store

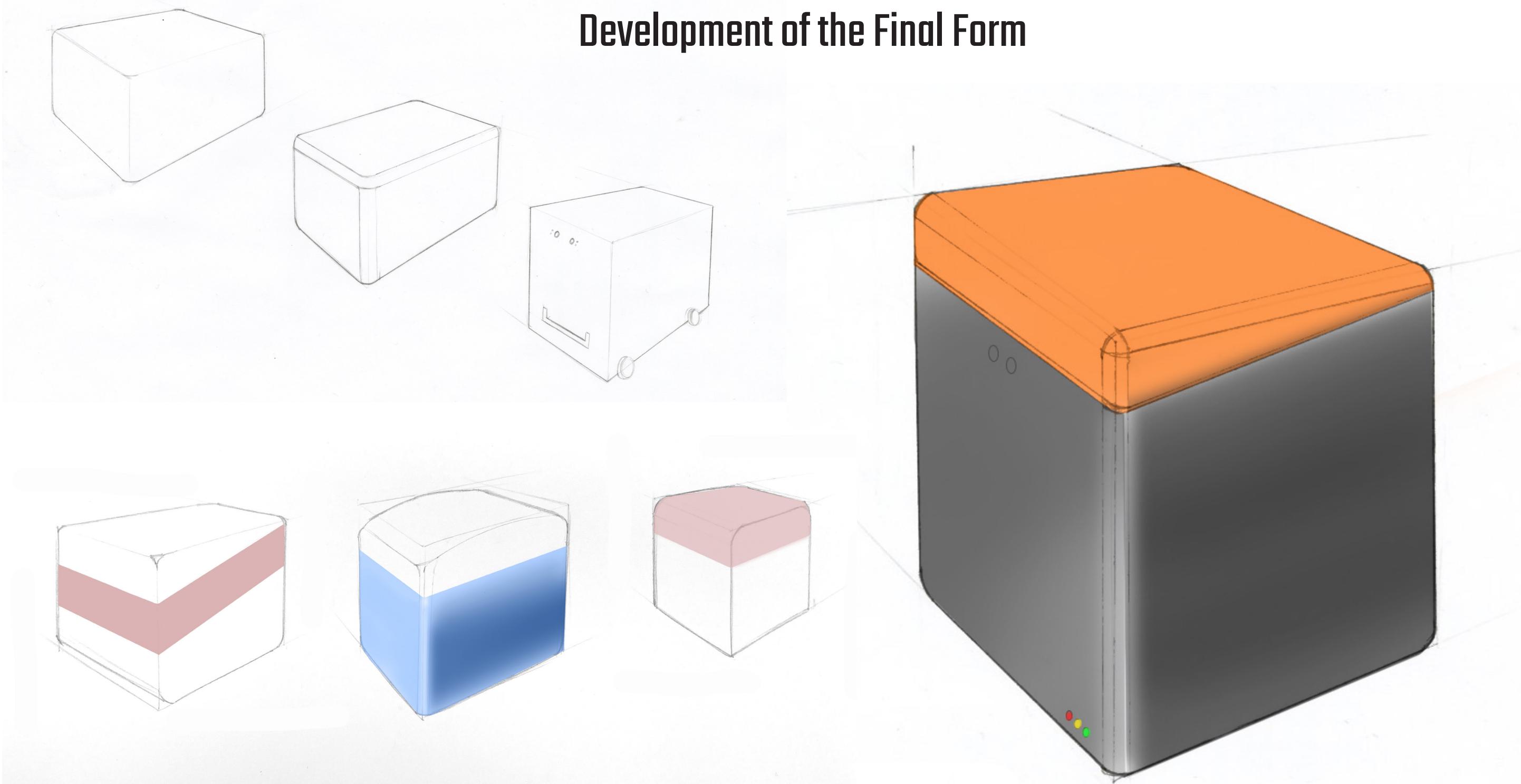
Inspiration



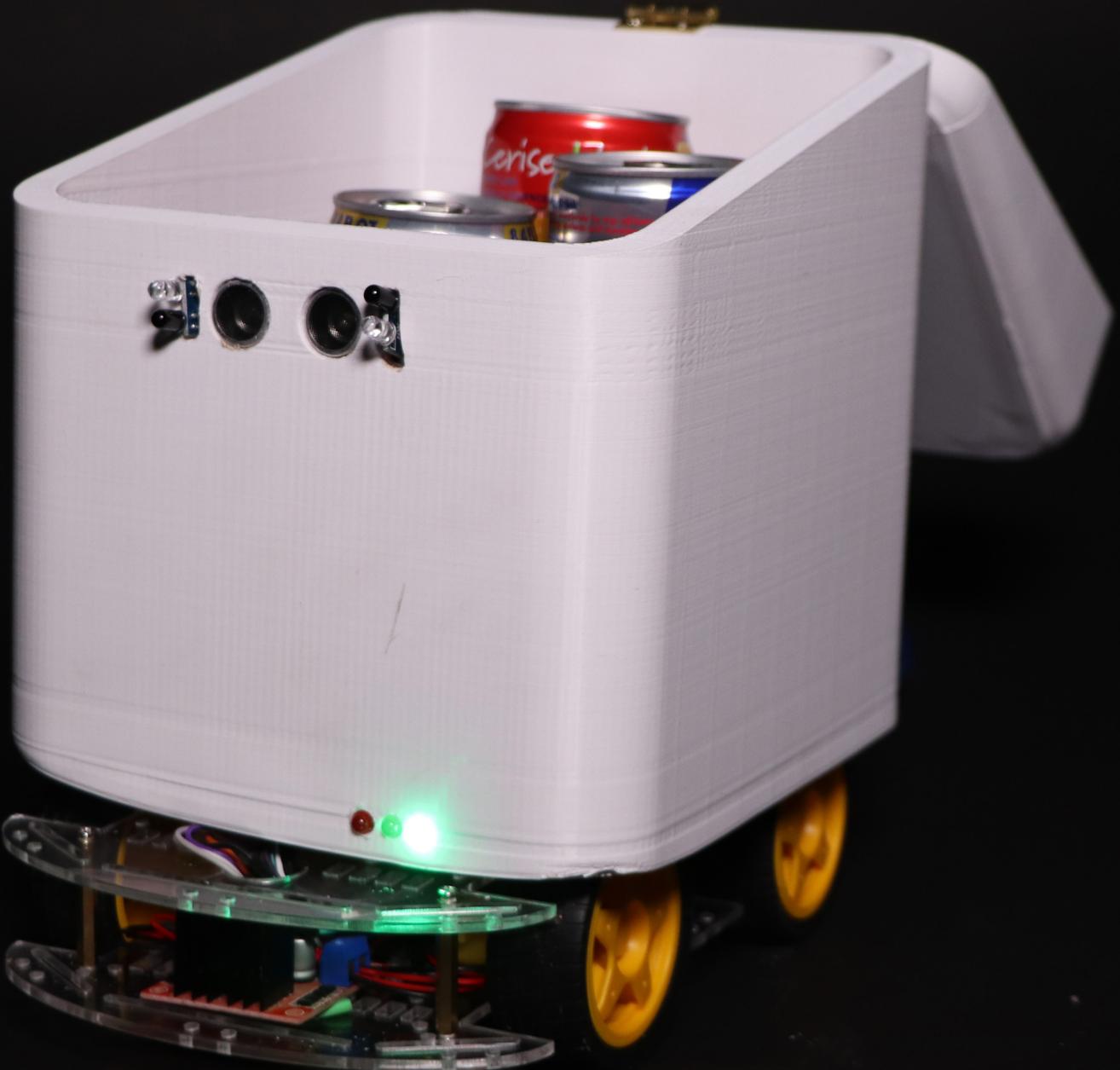
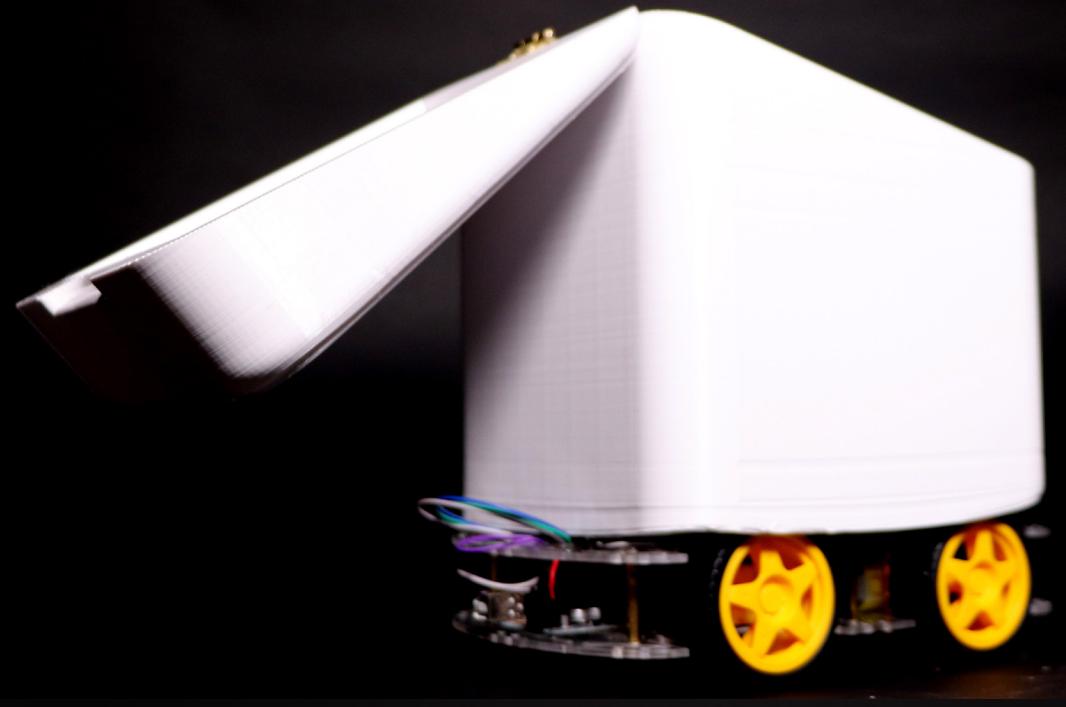
Sketch Ideation



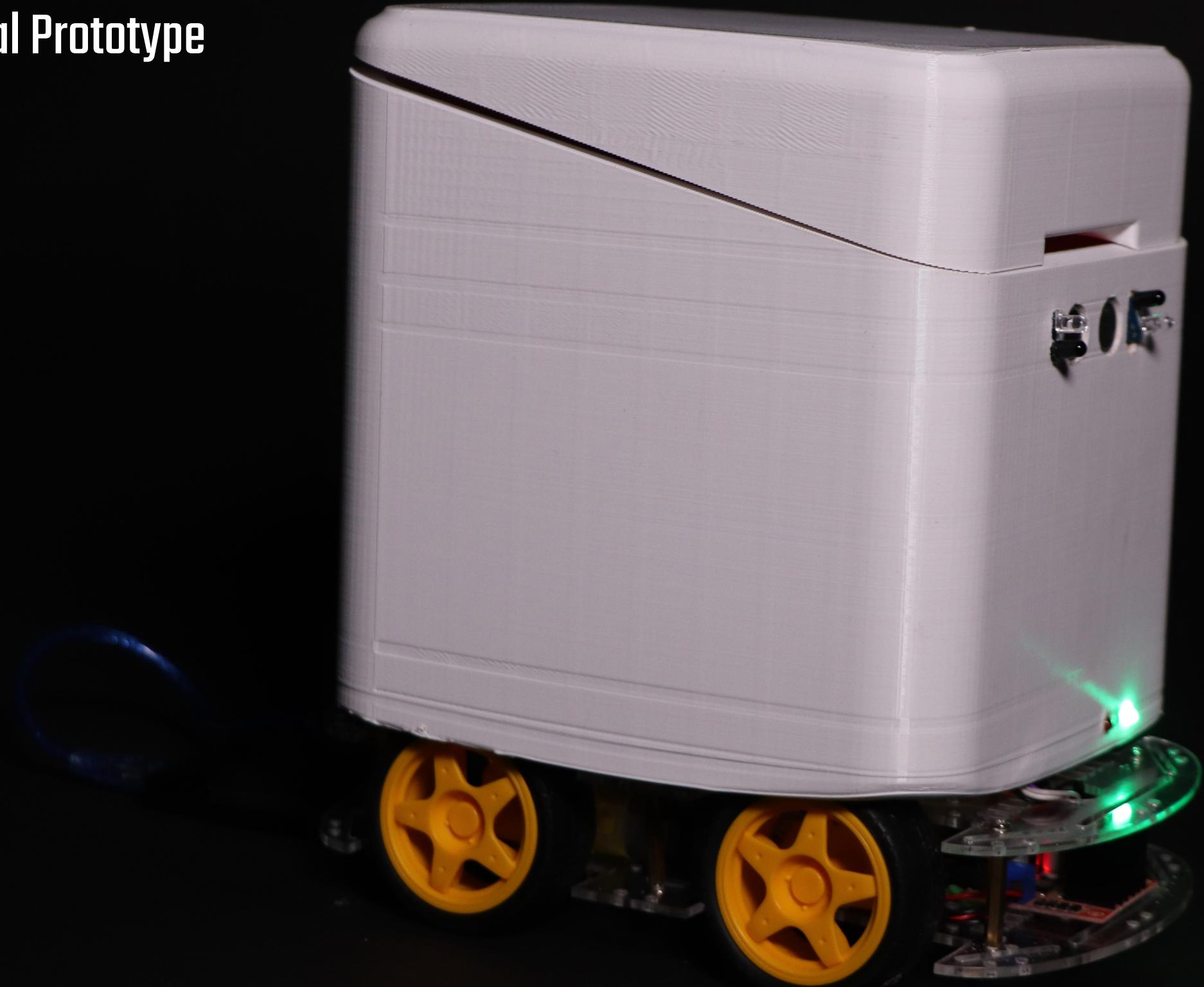
Development of the Final Form



Prototype Testing



Final Prototype



3D Modelling



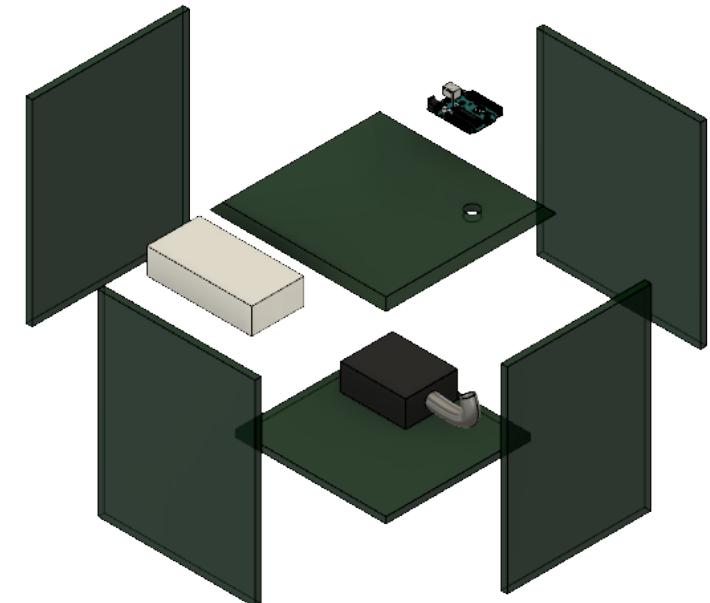
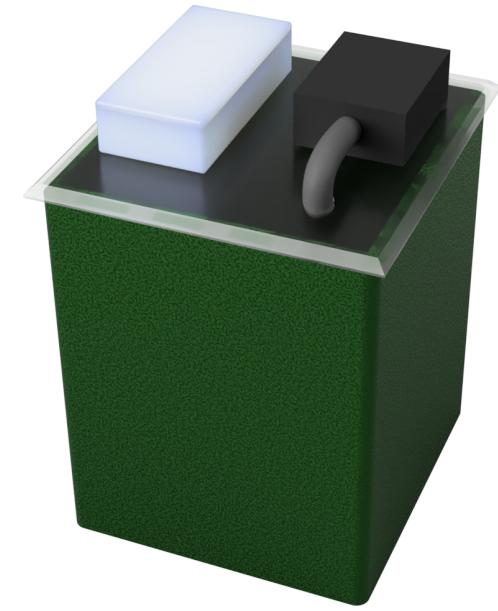
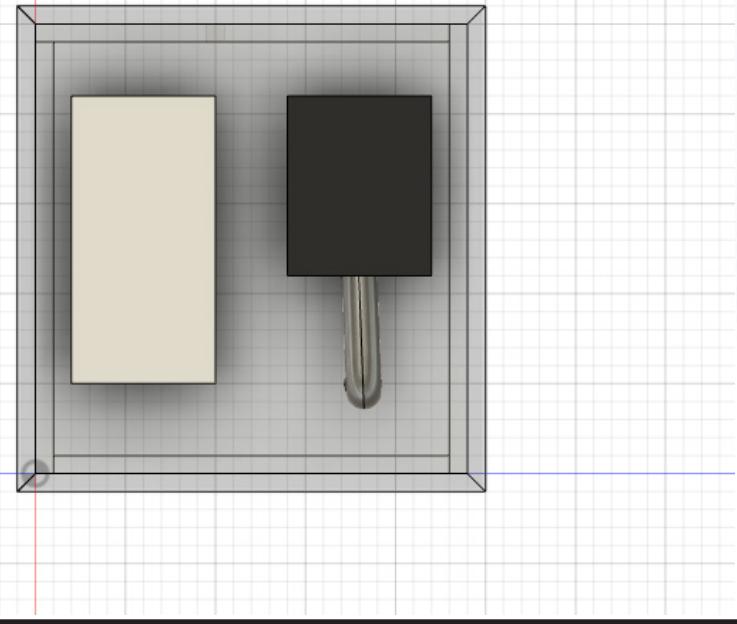
Product Options





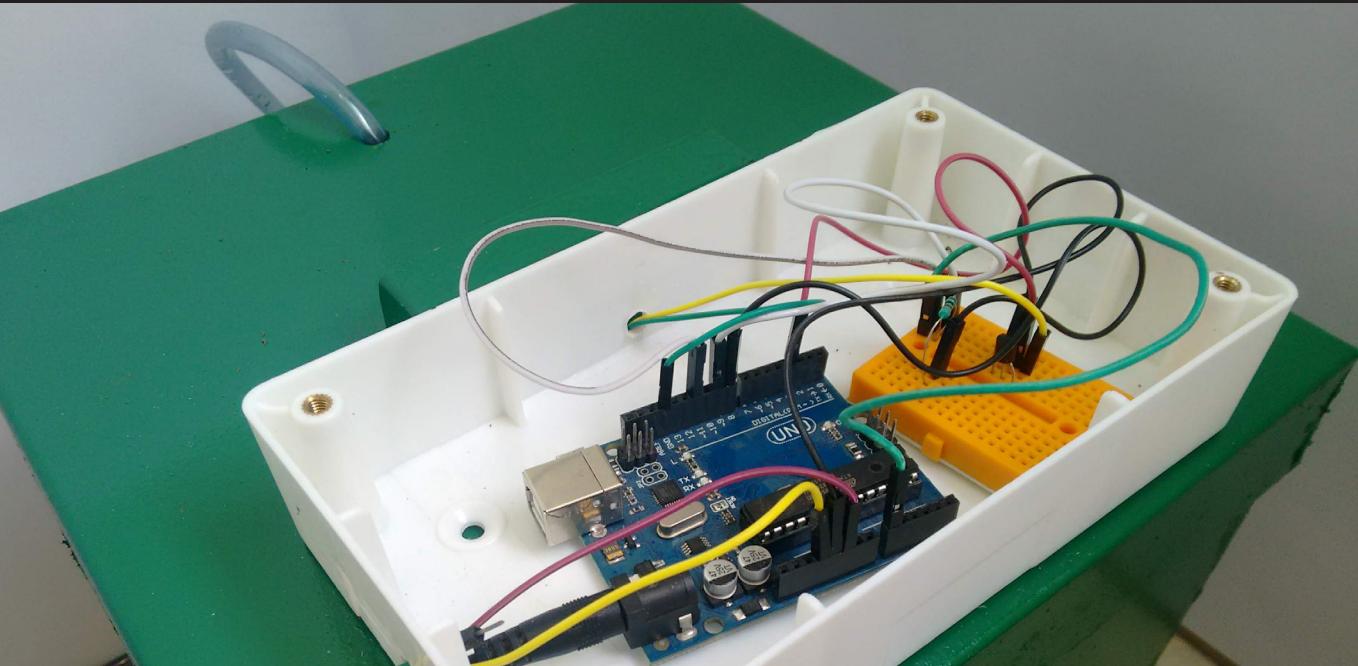






Eureka

Automated Watering Assistant



Why Automate Watering?



Conerves Water

Convience of automating
mundane tasks



Existing Products



IKEA PS FEJÖ Self-watering Planter

This product relieves the user of watering their plants every day by using a mechanism which involves using threads to suck water from the bottom of the pot to the soil because of the lower content of water in the soil.

Advantages:

Caster wheels make it easy to move

Reasonable cost (\$20)

Made of recyclable material

Water gauge indicates the water level

Disadvantages:

Not ideal for the outdoor environment

No effective way to drain excess water



GrowOya

This product is a terracotta pot that can be buried into the soil and filled with water about once a week. The water inside slowly seeps out through the walls to water the plants at the roots.

Advantages:

Saves water and time

Reduces weed growth

Plants get how much water they need

Material and development process is not hazardous to the environment

Disadvantages:

Expensive (\$25 for 1 small product which is sufficient for 2 feet diameter)

Difficult to install

Breaks at temperatures below zero if left in the soil



Rainbird Drip-Irrigation System

This product controls water flow to a set of plants through a pipe laid across the area that has to be watered. This method allows water to seep into the soil, providing sub-surface watering.

Advantages:

Saves water compared to usual watering

Better growth of plants

Does not require digging

One time set-up

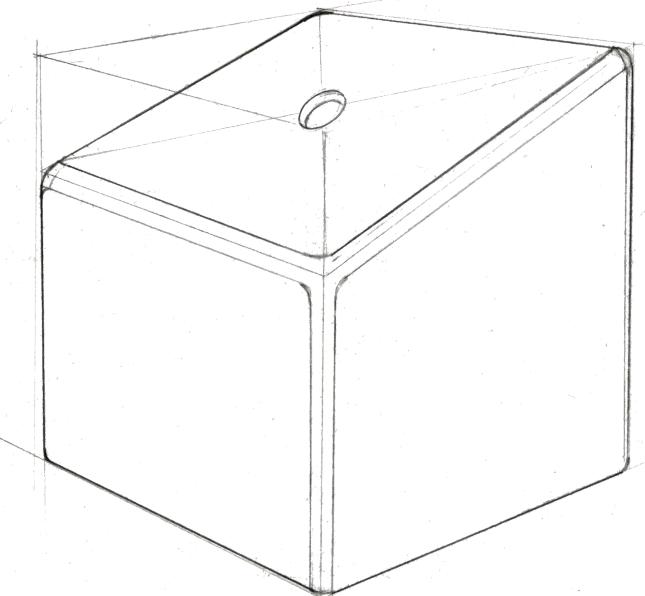
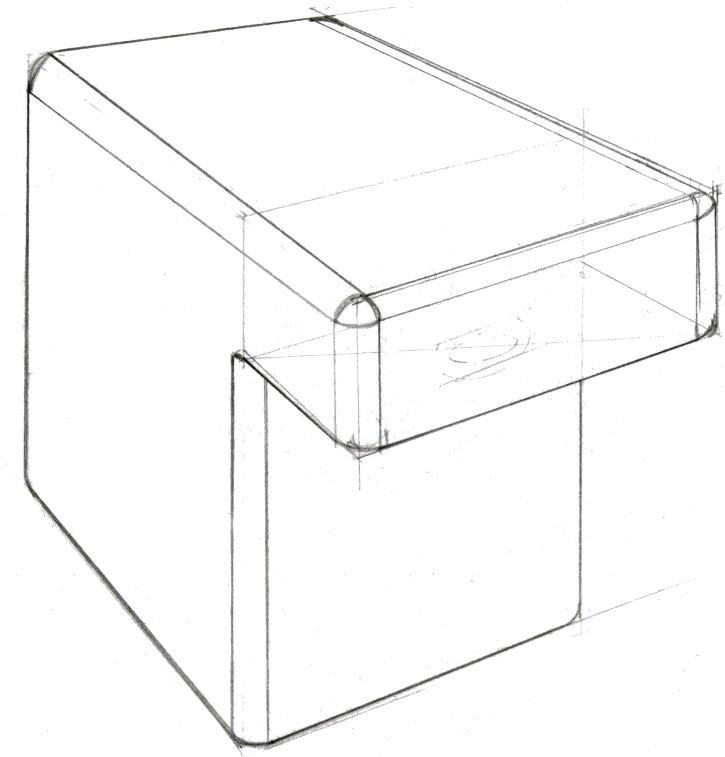
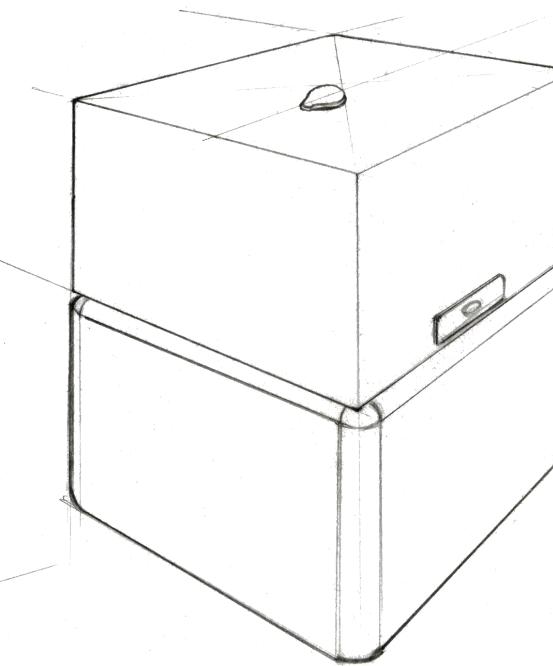
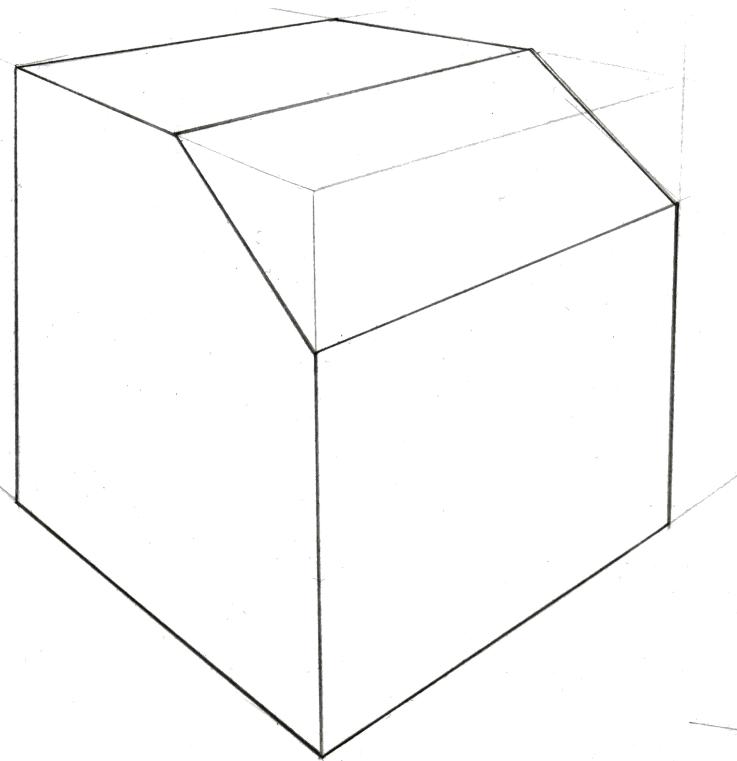
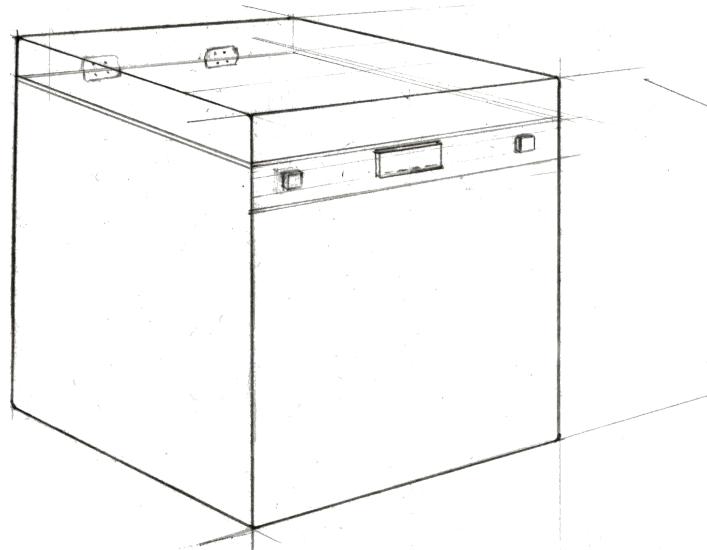
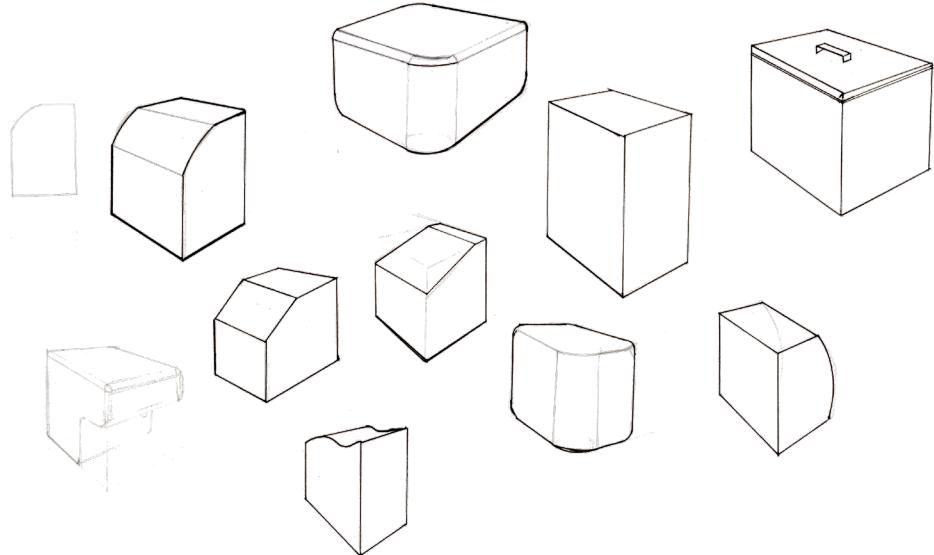
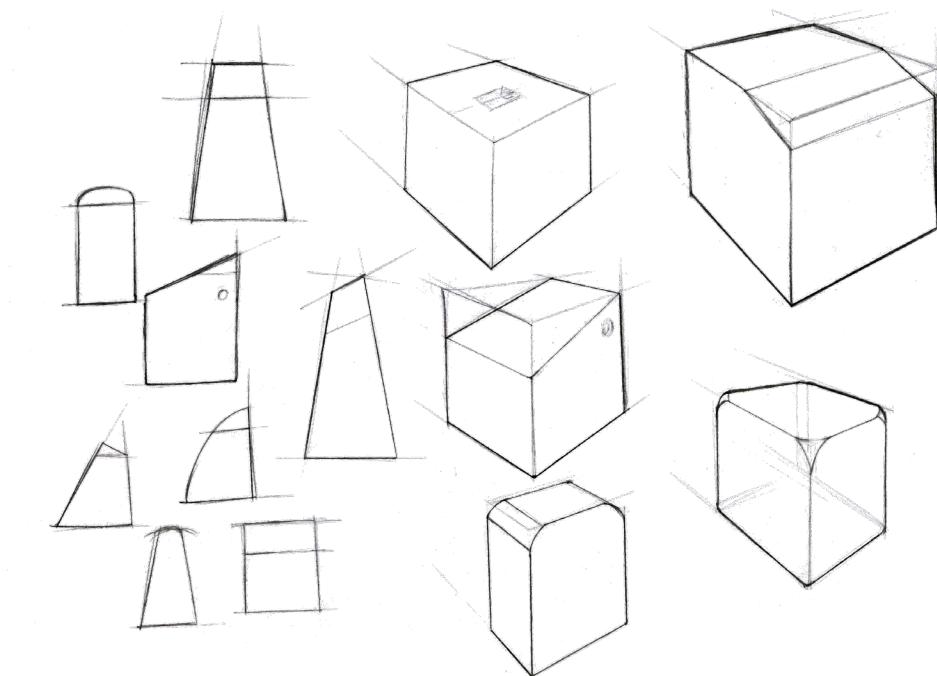
Disadvantages:

Requires a constant pressurized water supply

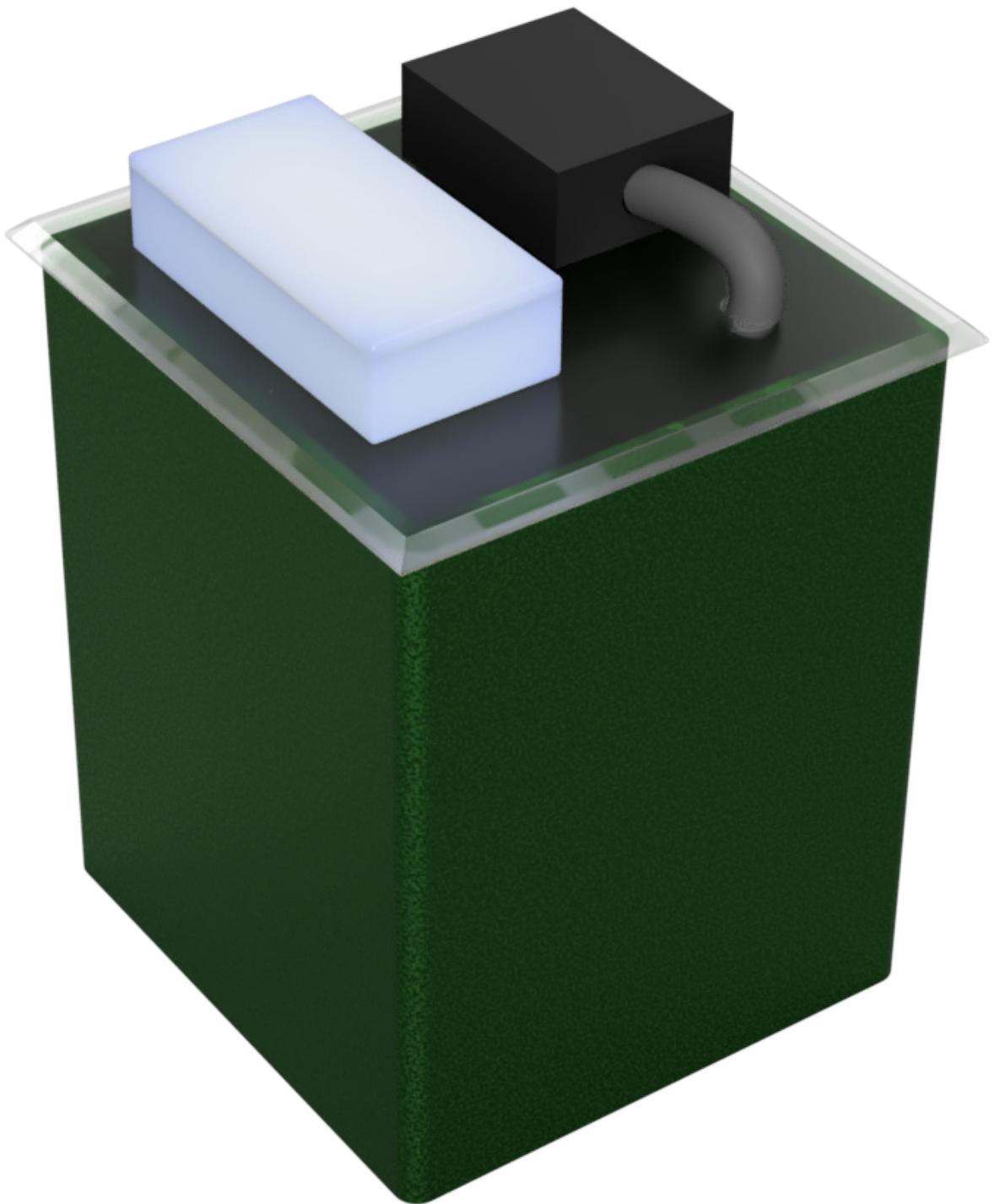
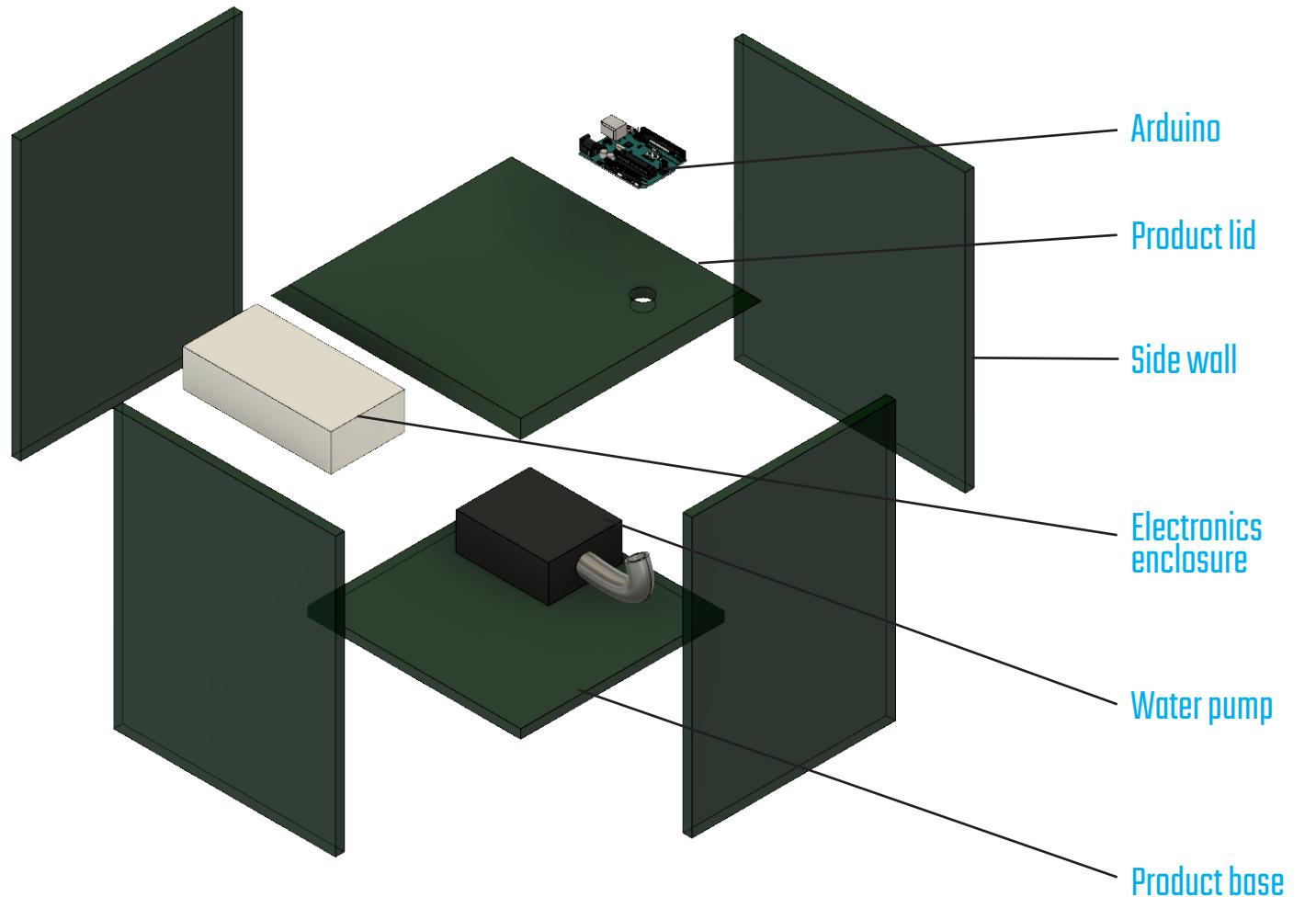
Expensive (\$130 for an area of up to 75 square feet)

User set watering frequency, not based on soil humidity

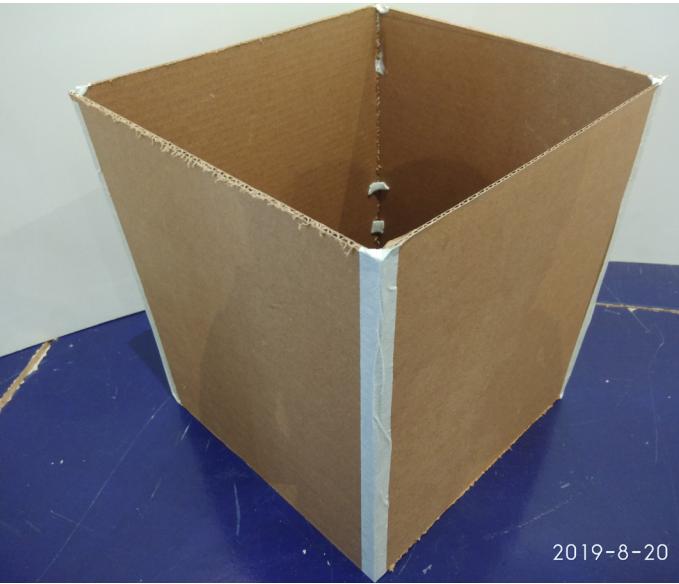
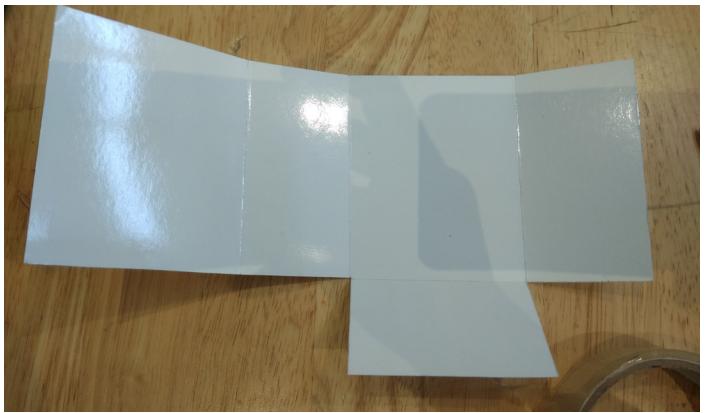
Sketch Ideation



Product Visualization



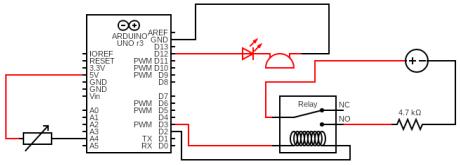
Prototyping



Material Exploration

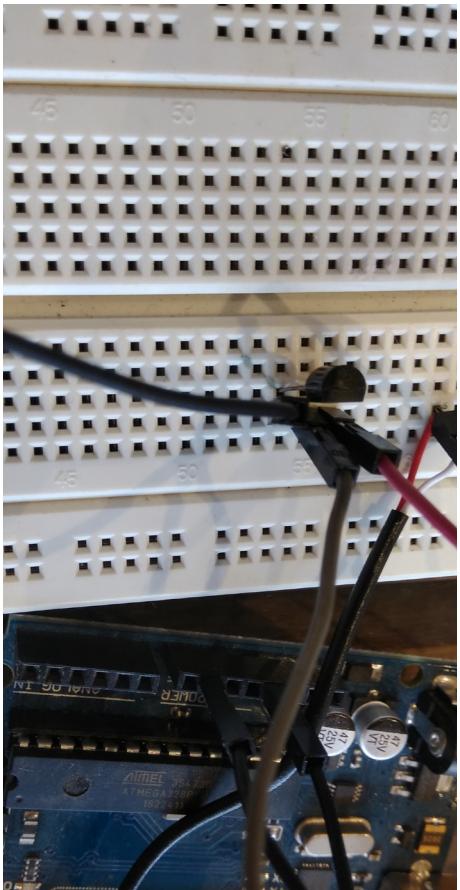
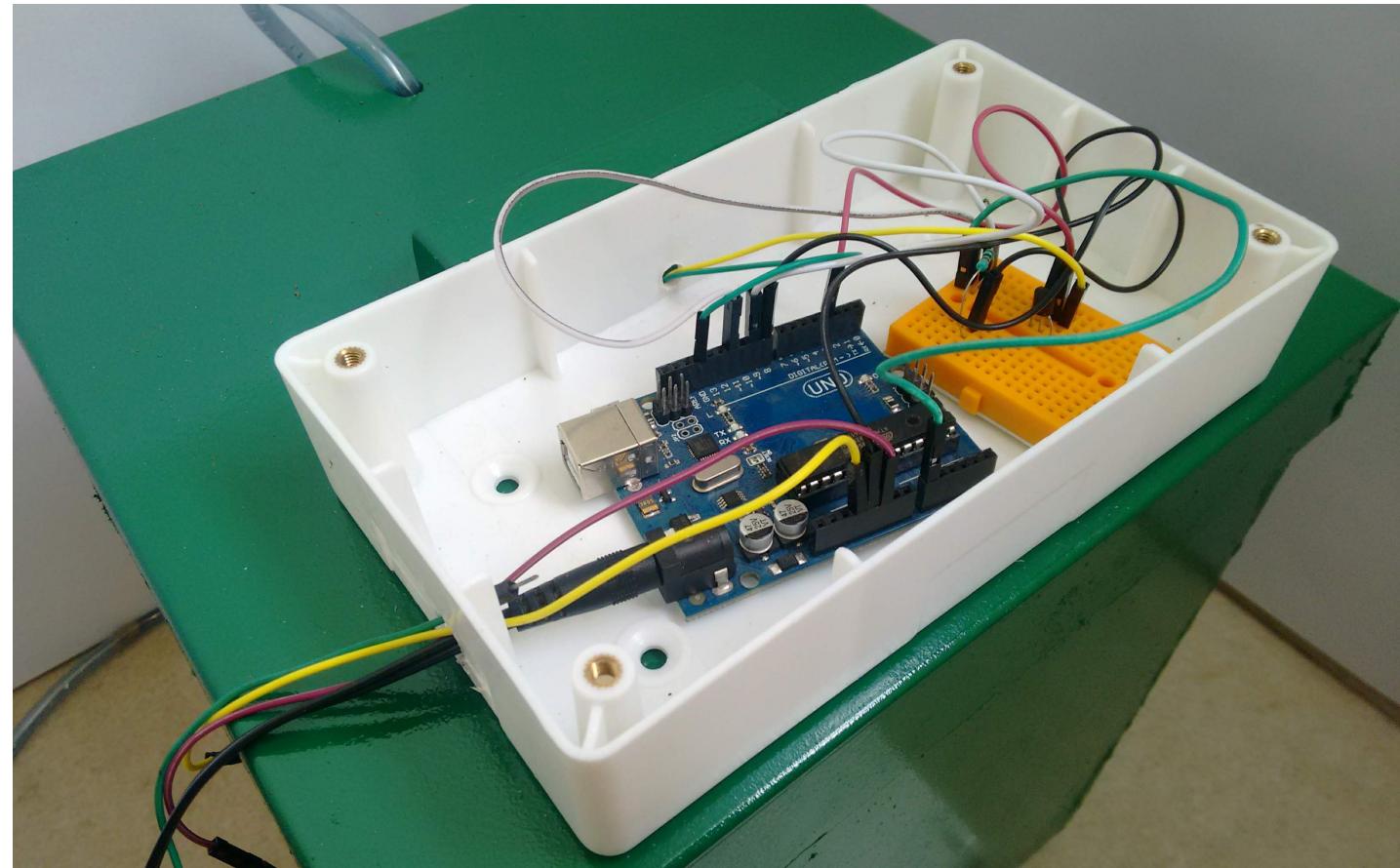
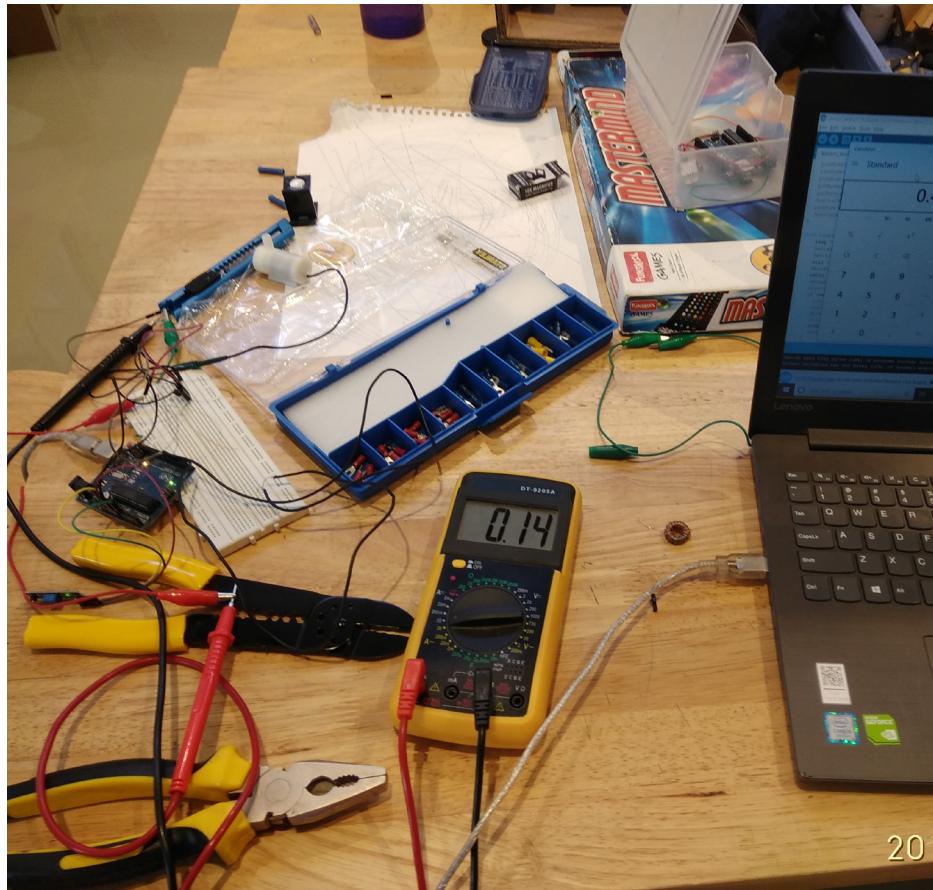
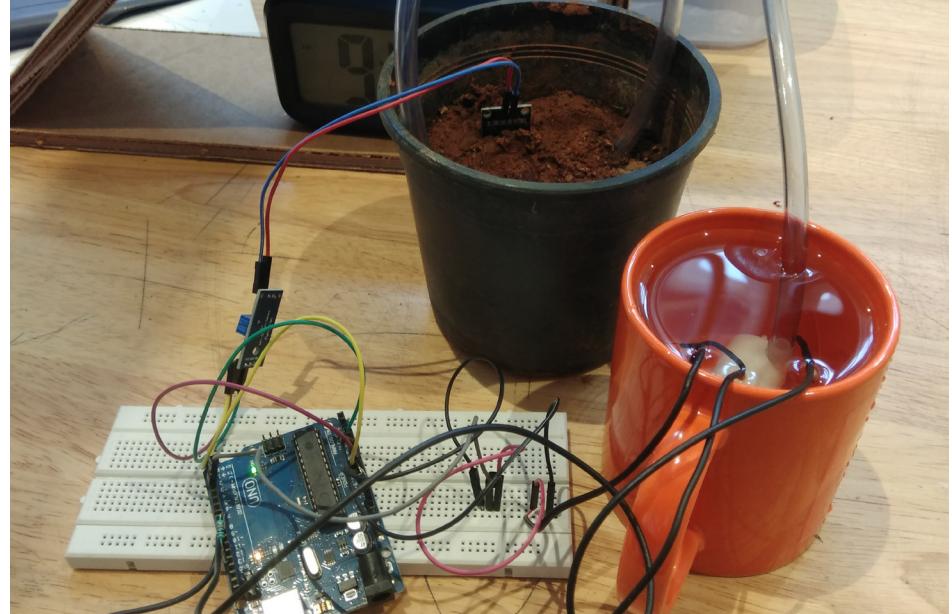


Electronic Prototyping



sensor_sketch | Arduino 1.8.9 (Windows Store 1.8.21.0)
File Edit Sketch Tools Help
COM9
sensor_sketch
void loop() {
 temp = dht.readTemperature();
 Serial.print("temp:");
 soil = analogRead(A0);
 Serial.println(soil);
 water = digitalRead(9);
 Serial.println(water);
 delay(1000);
 if (water == 0) { //Warn user if tank is empty
 digitalWrite(11,HIGH); //Switch on LED
 digitalWrite(12,HIGH); //Switch on buzzer
 delay(1000); //Buzz for 1 second
 digitalWrite(12,LOW); //Switch off buzzer
 enabled = 0; //Disable water pump
 }
 if (soil < 500) { //If soil humidity is low
 if (enabled == 1){ //If water is in the tank
 digitalWrite(3,HIGH); //Switch on water pump
 delay(2000); //Keep pump on for 2 seconds
 digitalWrite(3,LOW); //Switch off water pump
 }
 }
}
Done uploading.
Sketch uses 5130 bytes (15%) of program storage space. Maximum is 32256 bytes.
Global variables use 228 bytes (11%) of dynamic memory, leaving 18228 bytes free.
36

The screenshot shows the Arduino IDE interface with the uploaded sketch named "sensor_sketch". The code reads temperature from a DHT sensor, reads soil moisture from an analog pin (A0), and reads the state of a digital pin (pin 9). It also checks for an empty water tank and a low soil moisture level to trigger a water pump.



Finishing

