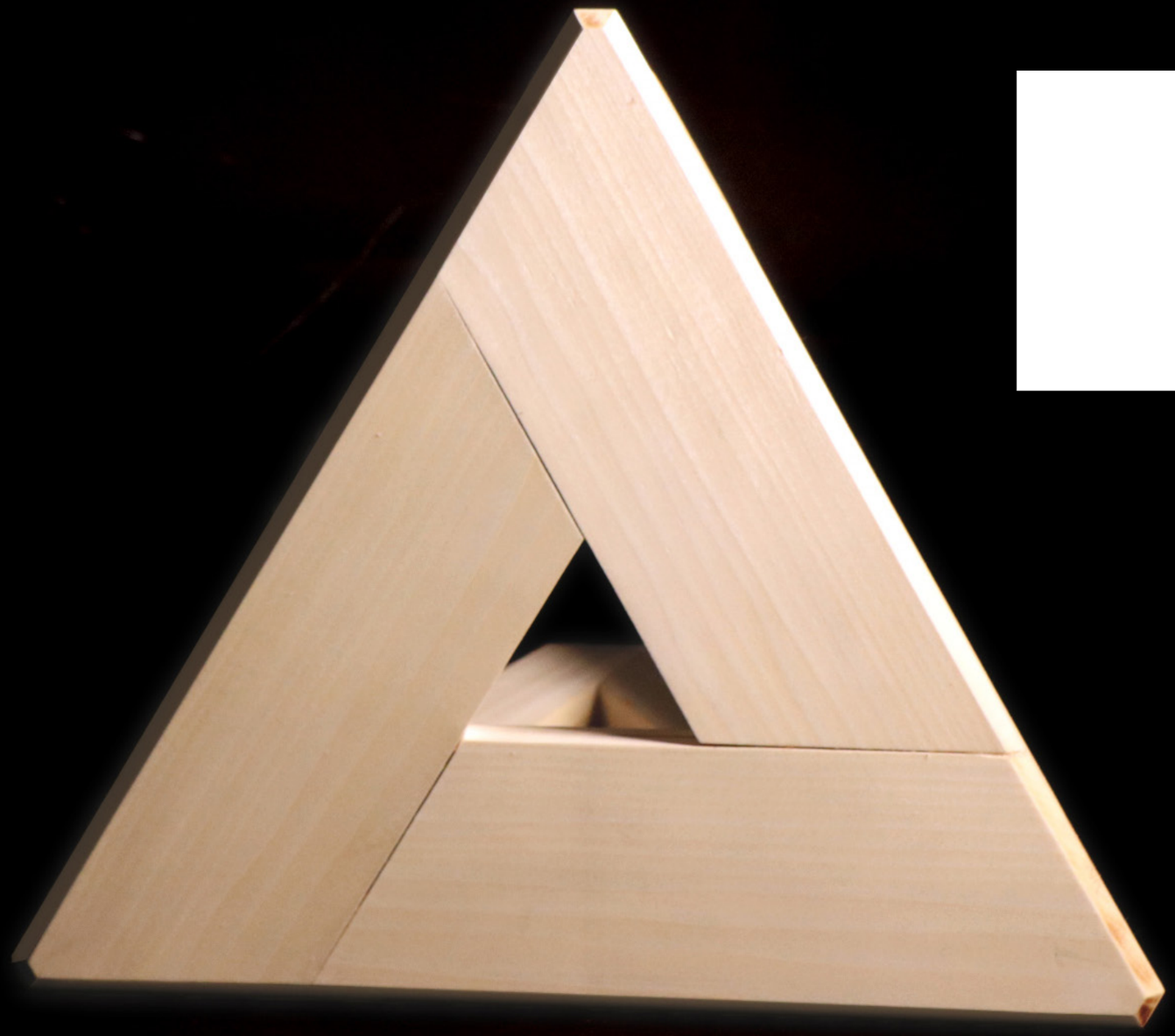
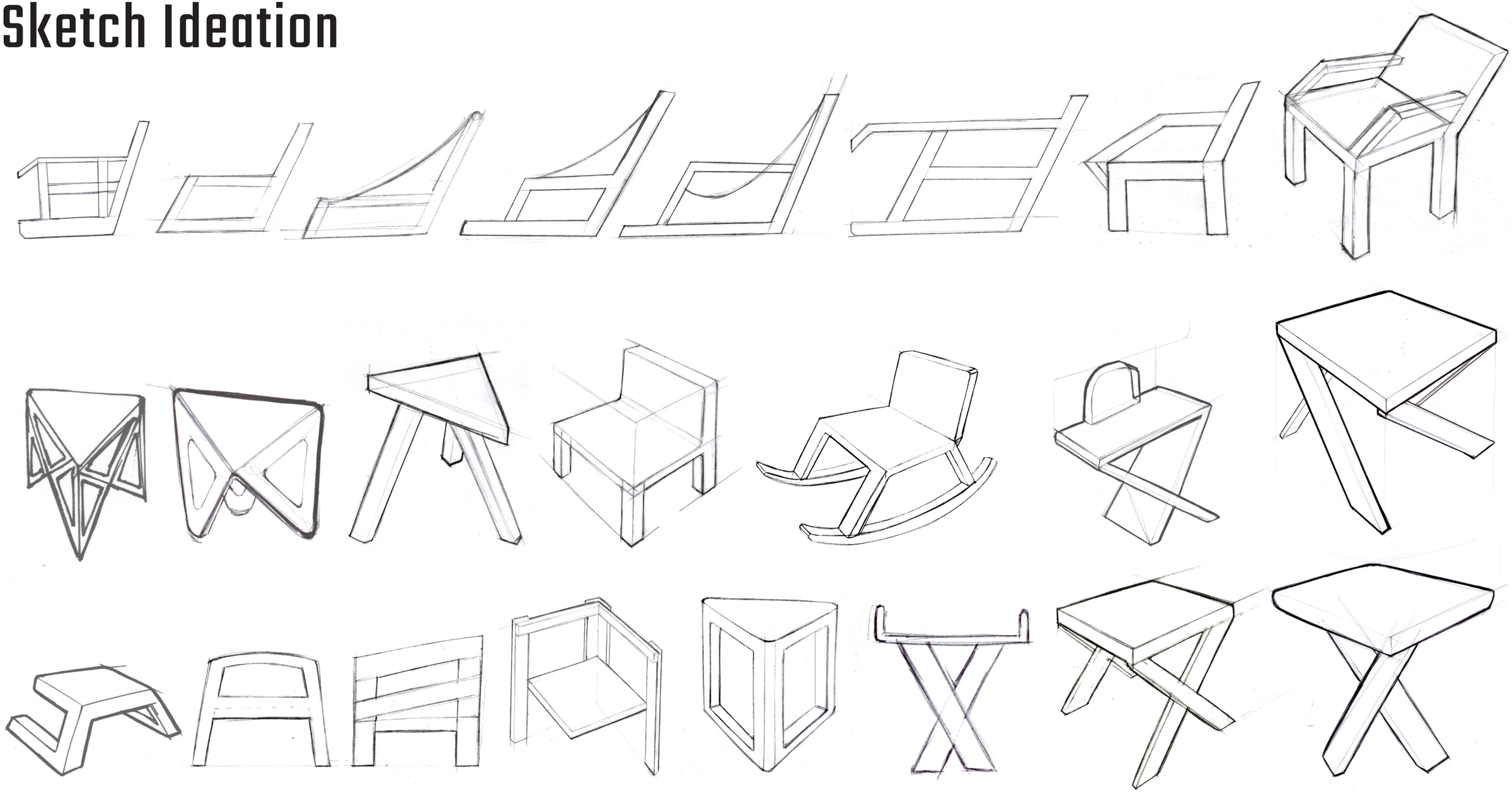


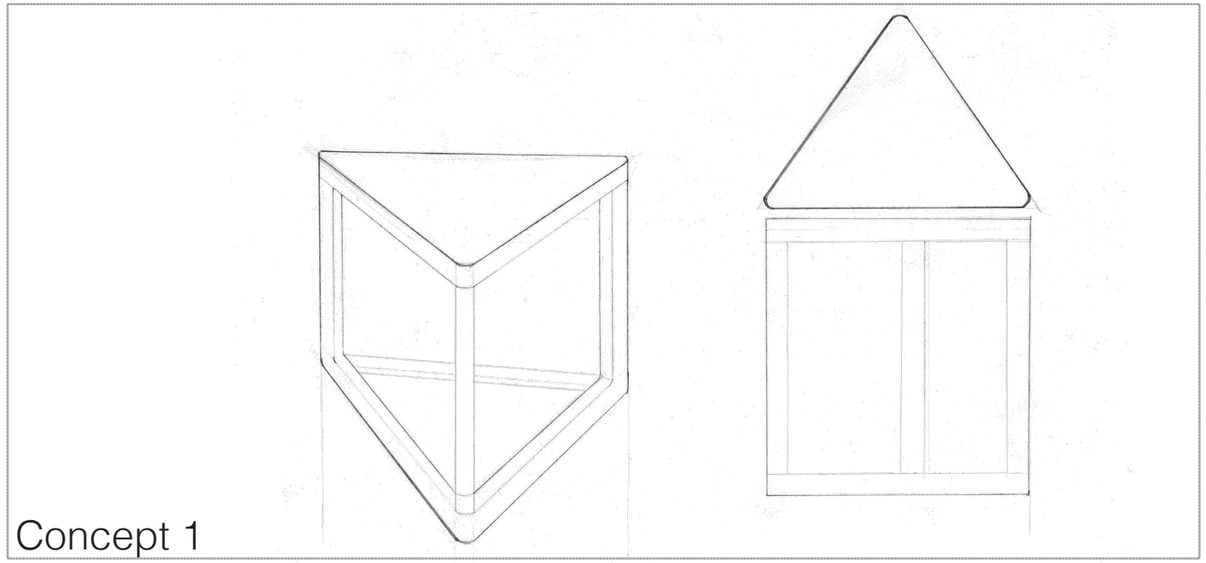
△Stool

By Vikram Mishra

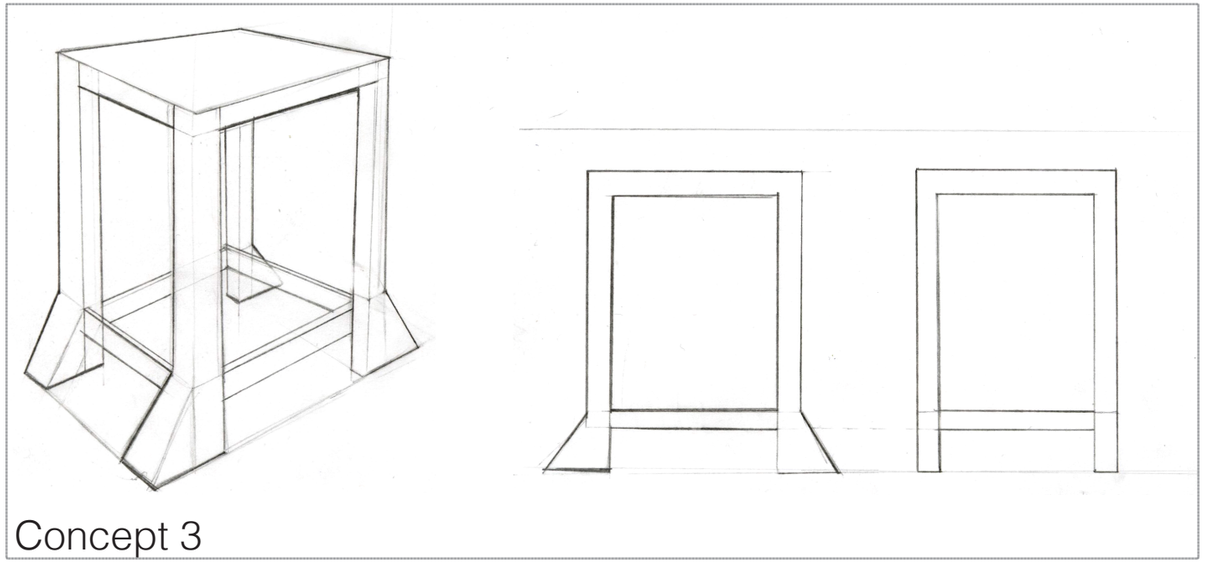
Sketch Ideation



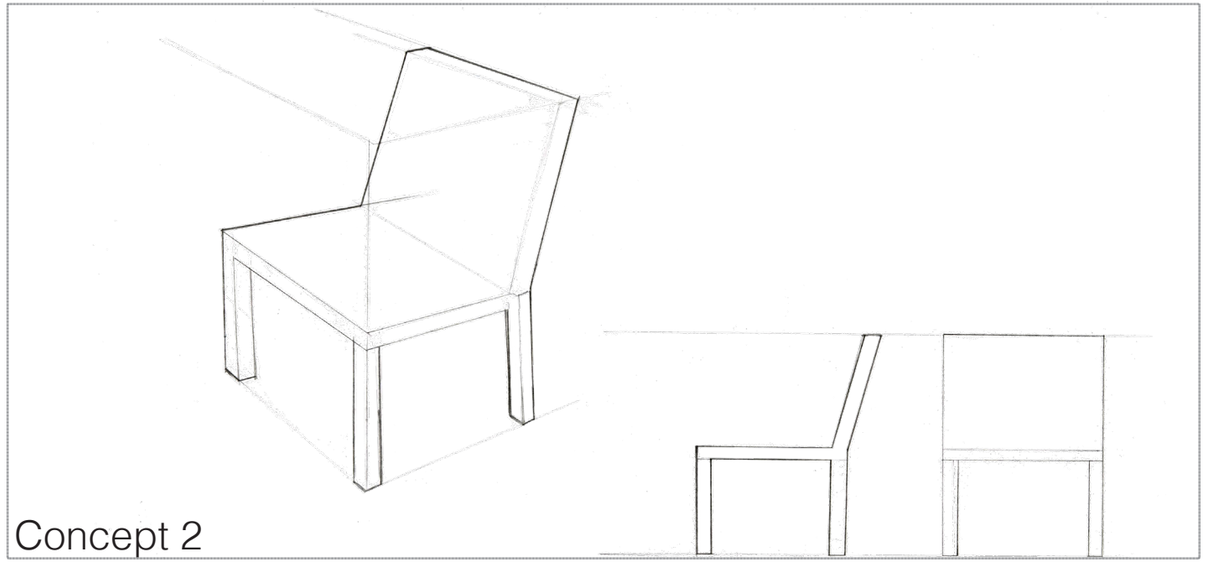
Concept Direction



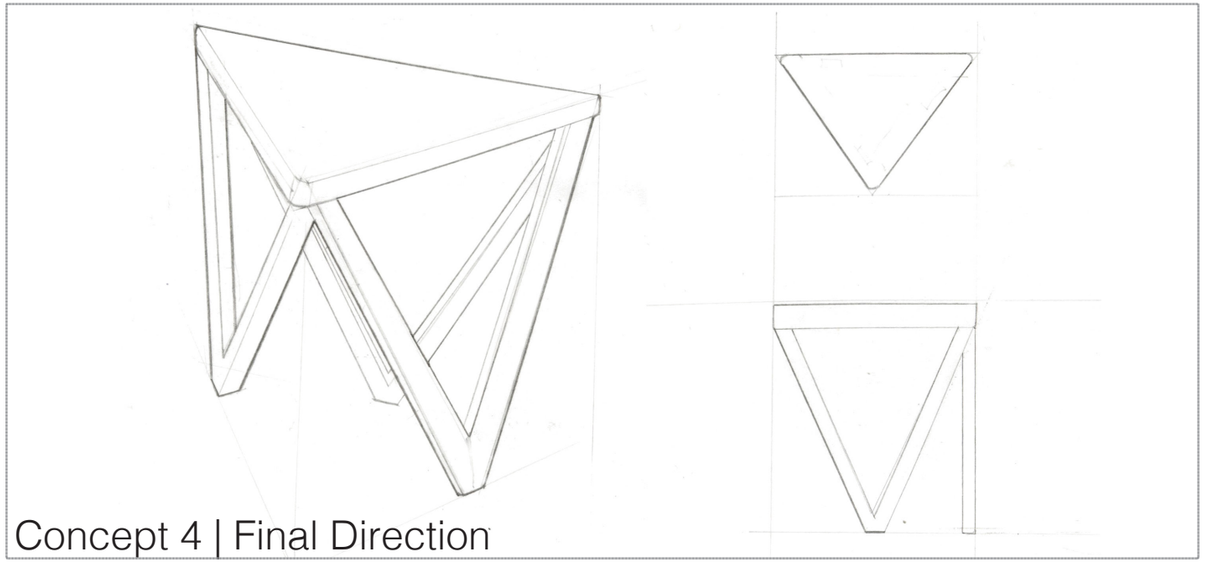
Concept 1



Concept 3

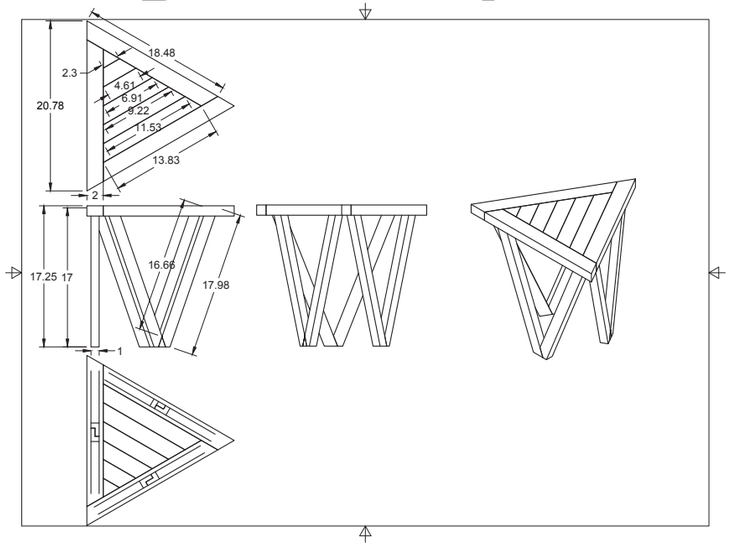


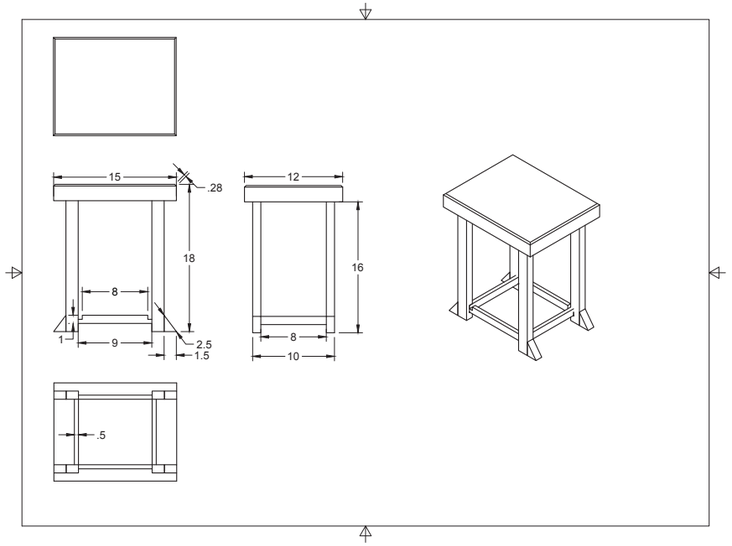
Concept 2

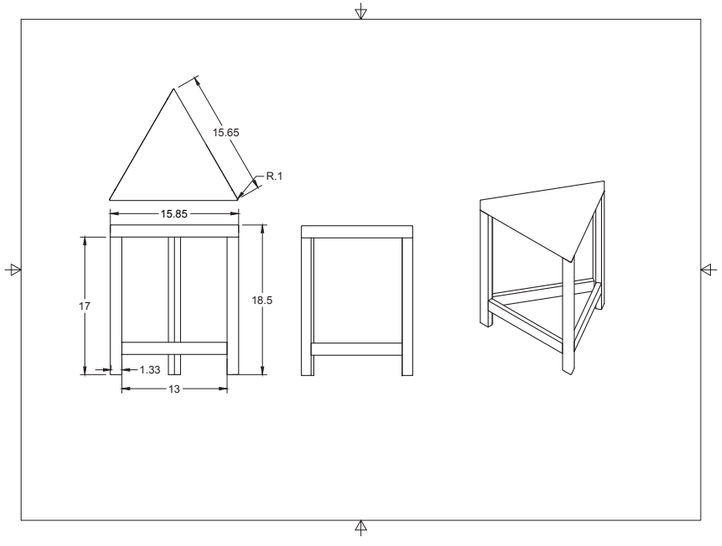


Concept 4 | Final Direction

Design Concepts





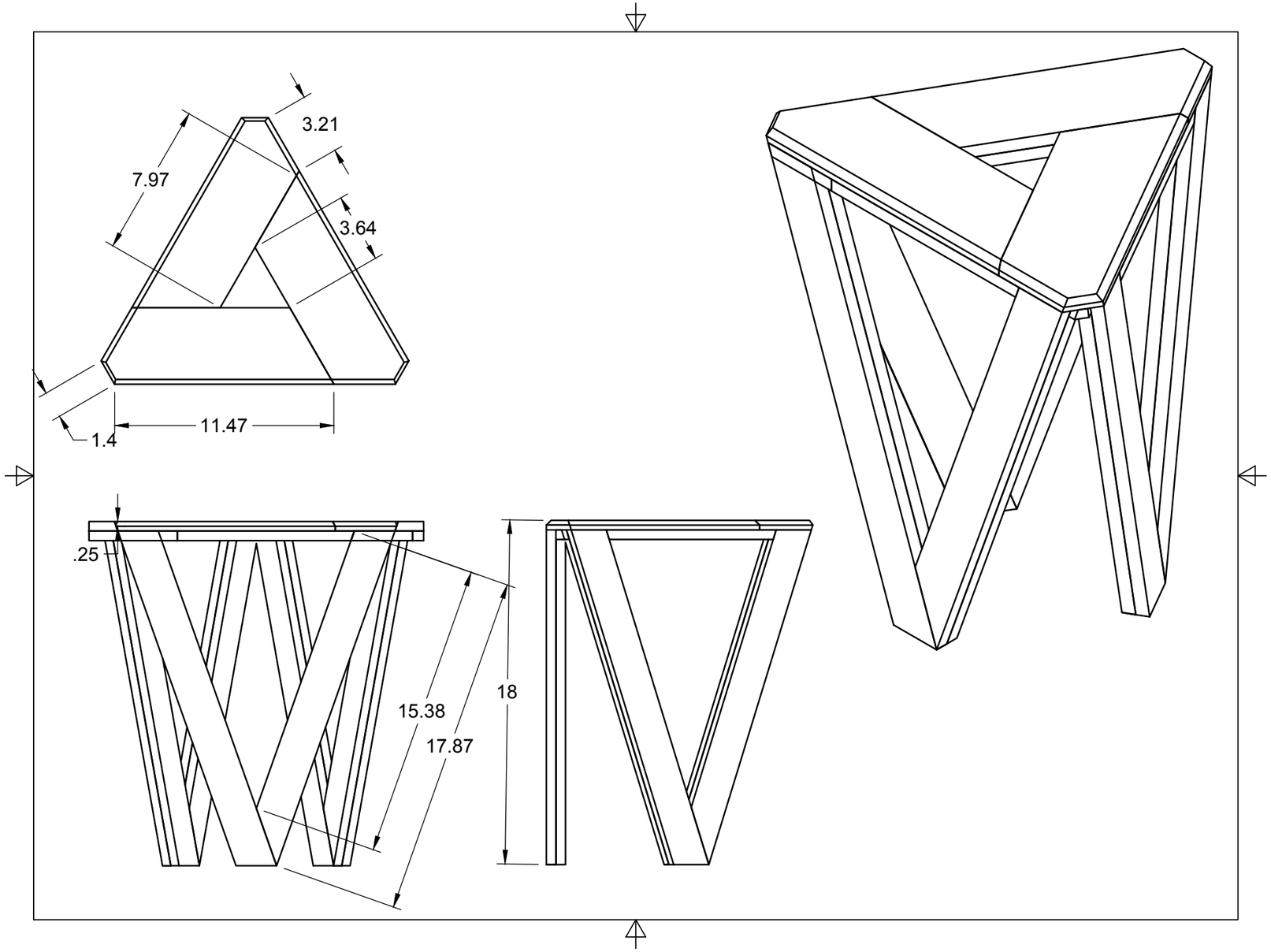


Full Scale Prototype

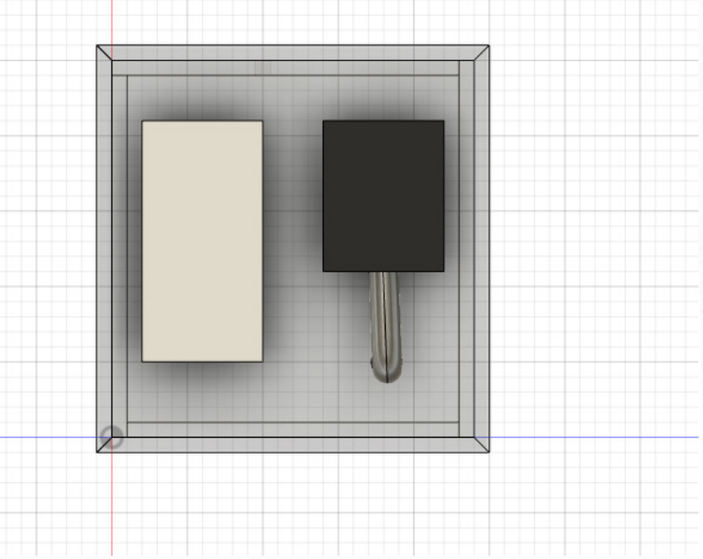
Advanced my final design direction from CAD into the physical world, working from 2x4 lumbar.

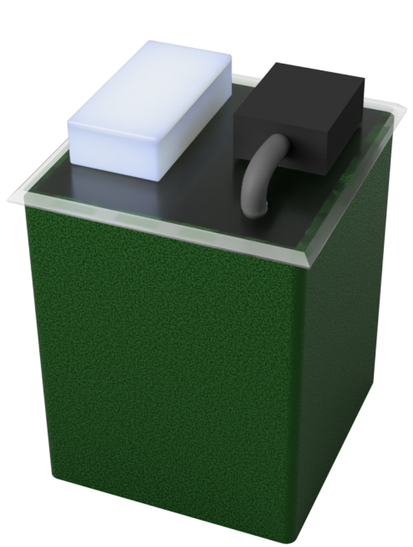
Used pine wood to make a full-scale model and learned the manufacturing process shortcomings and ways to make the process more efficient.

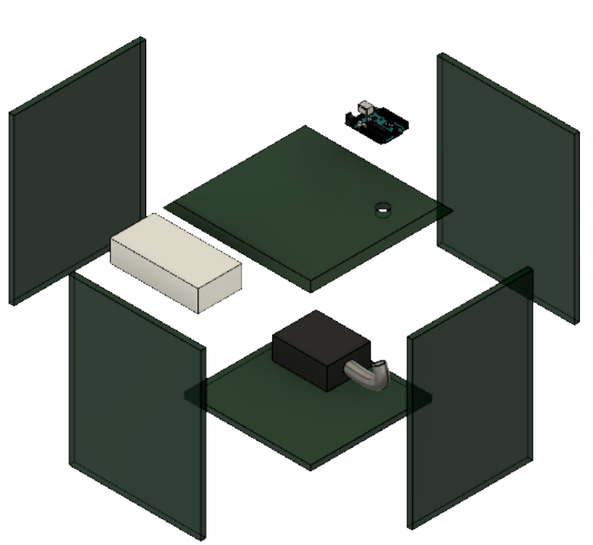
Construction



The Δ Stool

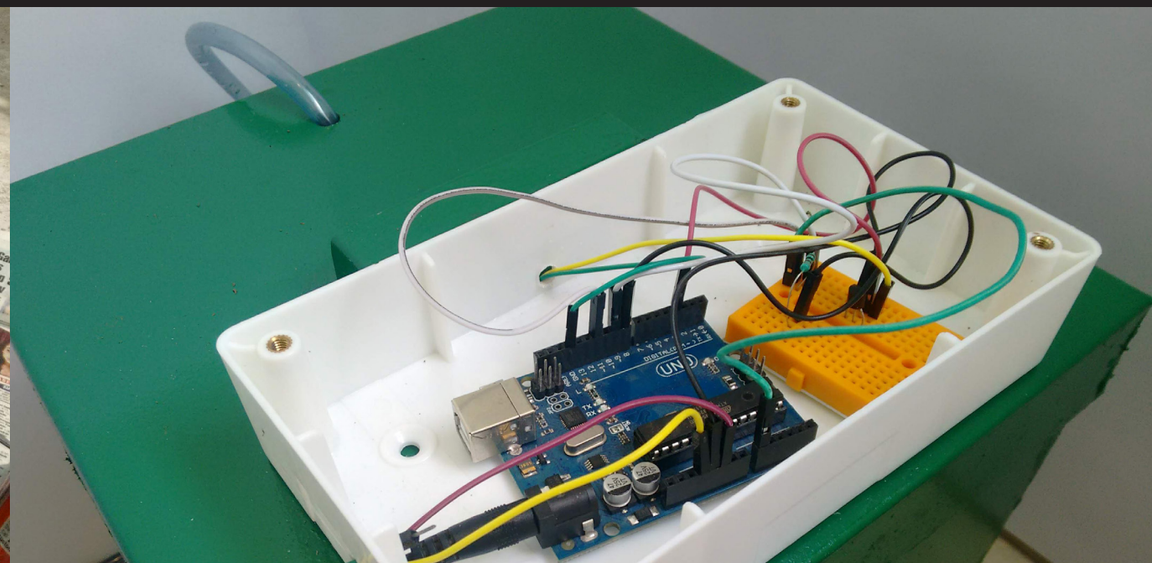






Eureka

Automated Watering Assistant



Why Automate Watering?

Conserves 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 seap into the soil, providing sub-surface watering.

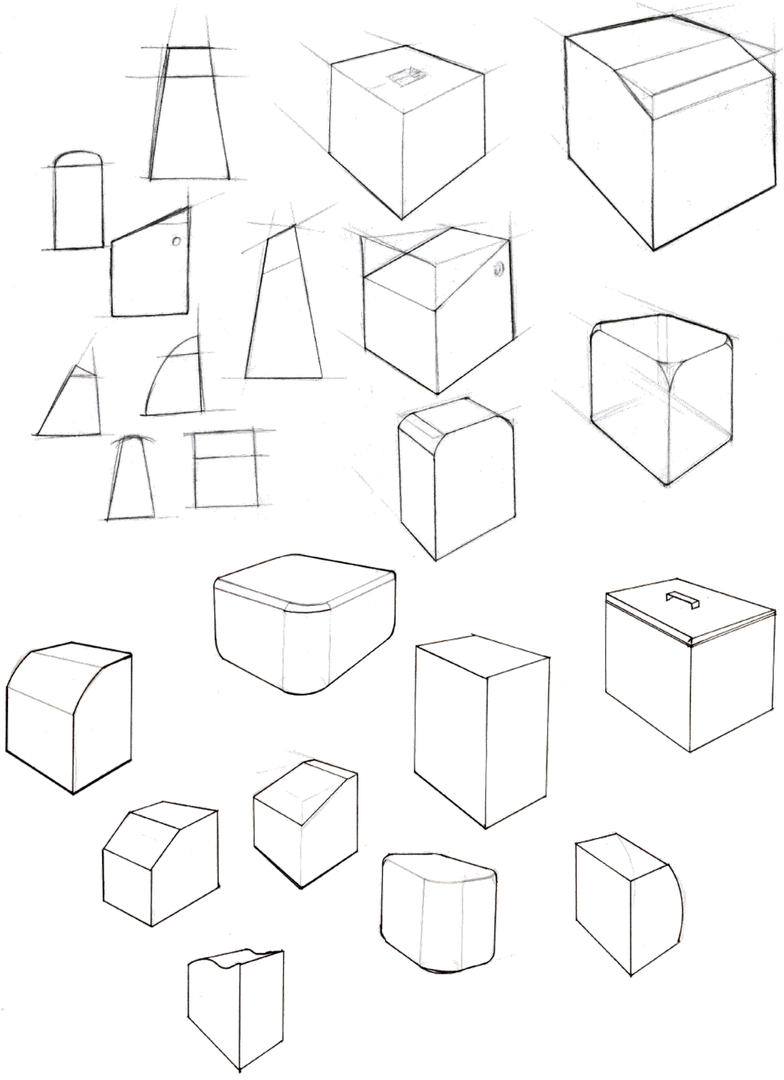
Advantages:

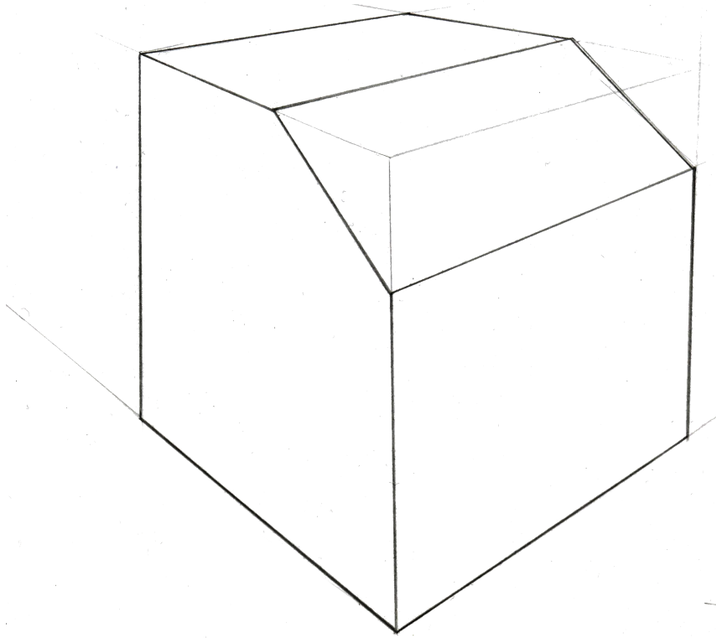
Saves water compared to usual watering
Better growth of plants
Does not require digging
One time set-up

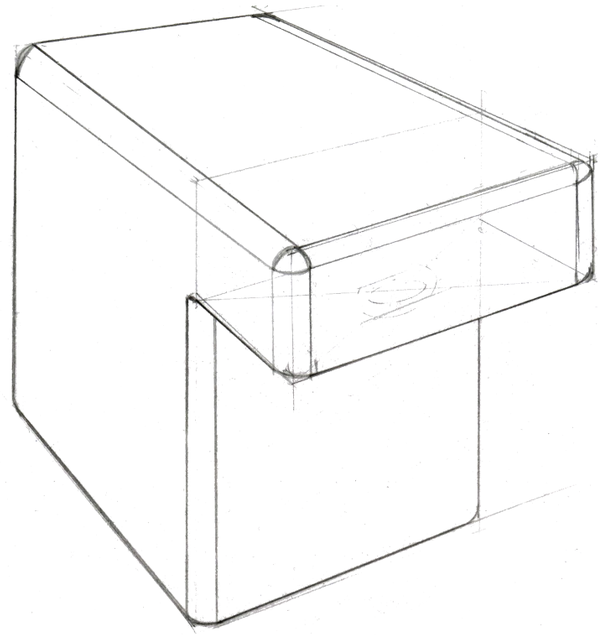
Disadvantages:

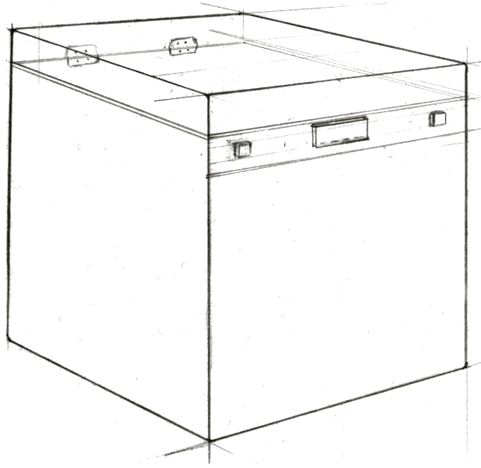
Requires a constant pressurized water supply
Expensive($130 for an area of up to 75 square feet)
User set watering frequency, not based on soil humidity

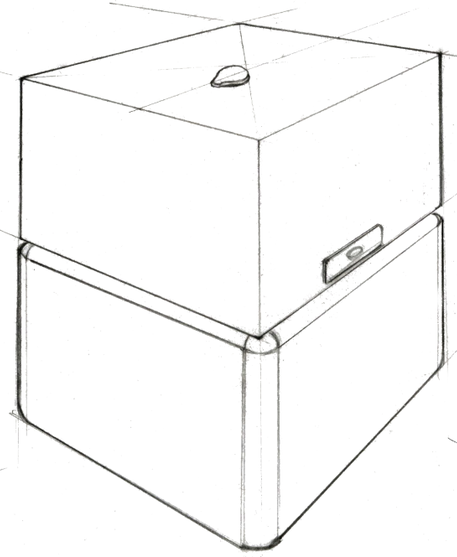
Sketch Ideation

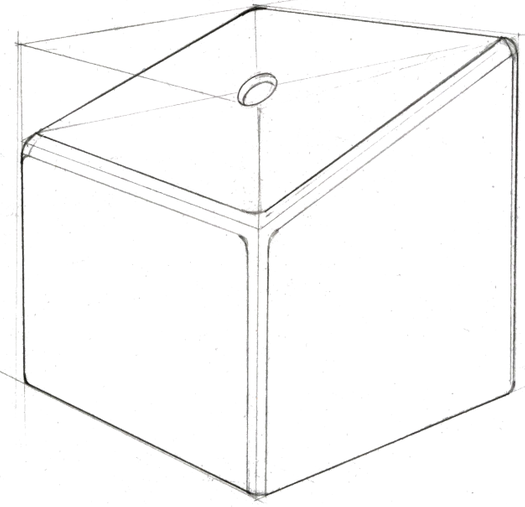




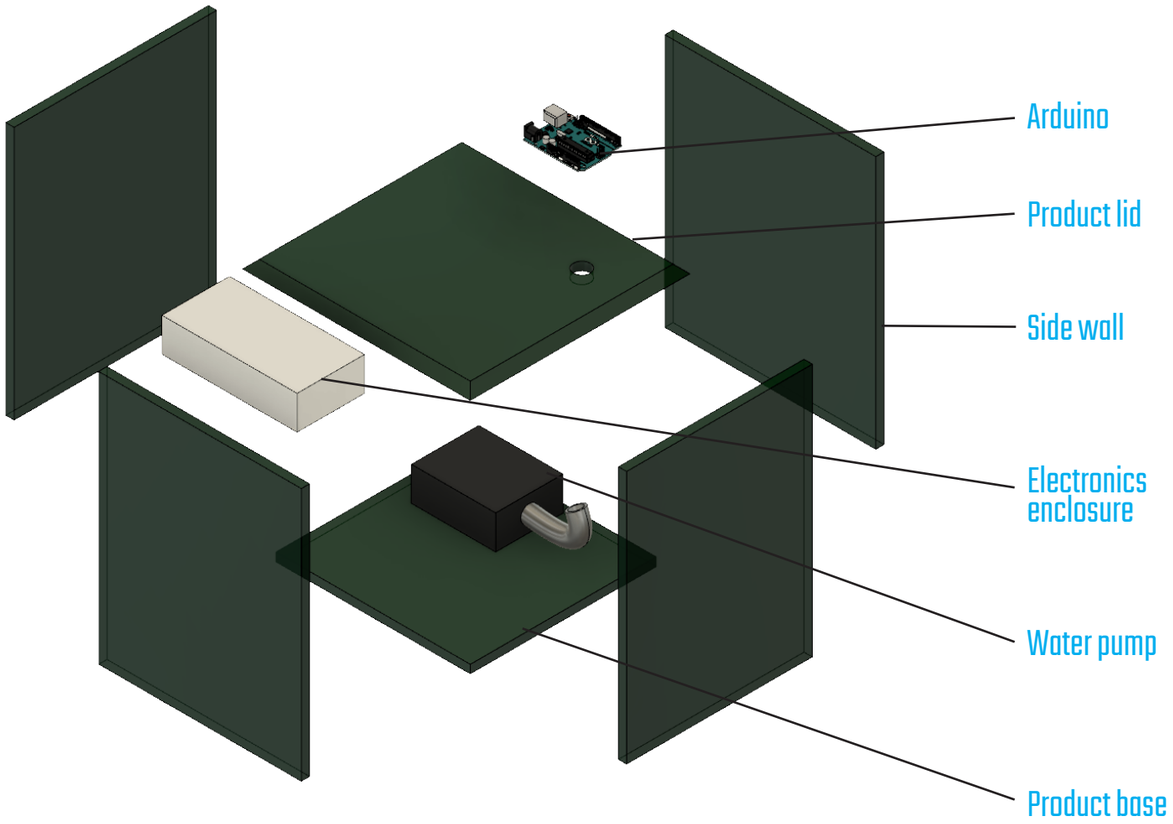


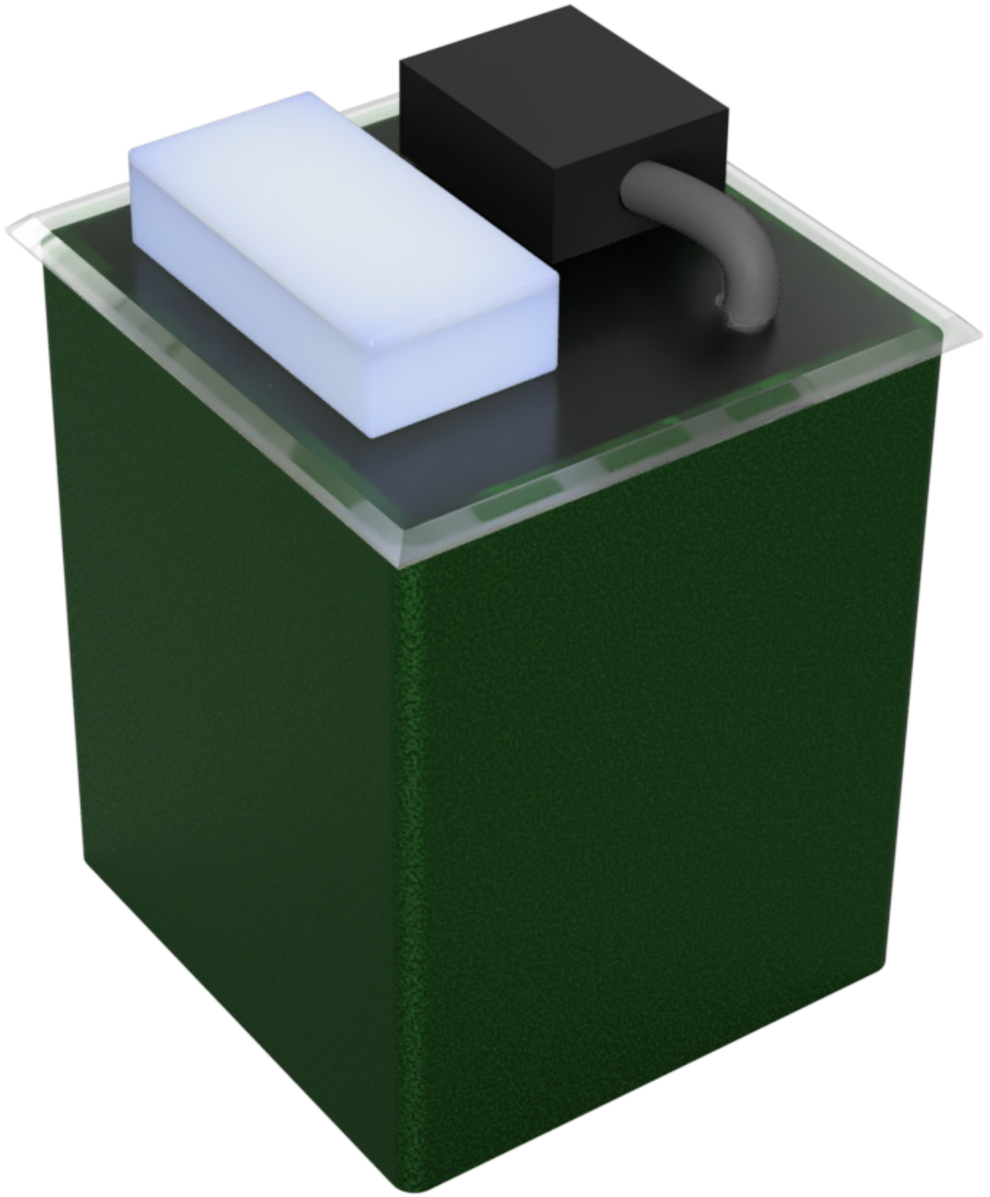




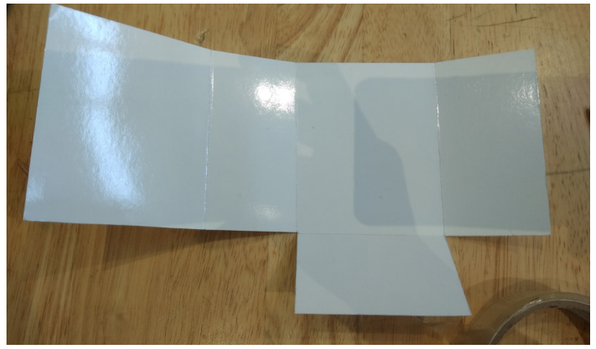


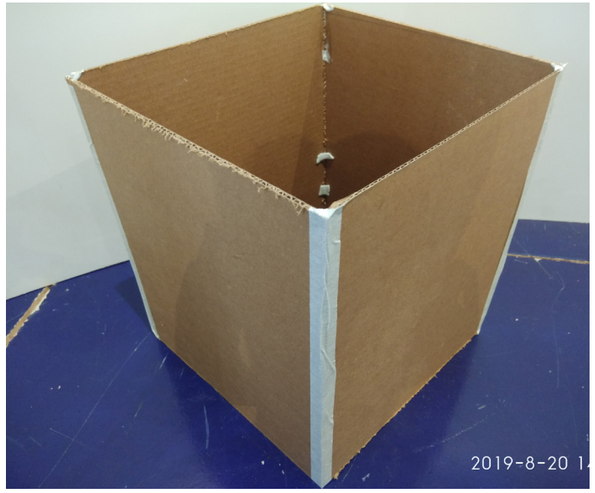
Product Visualization



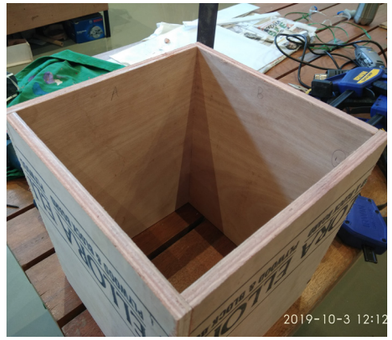


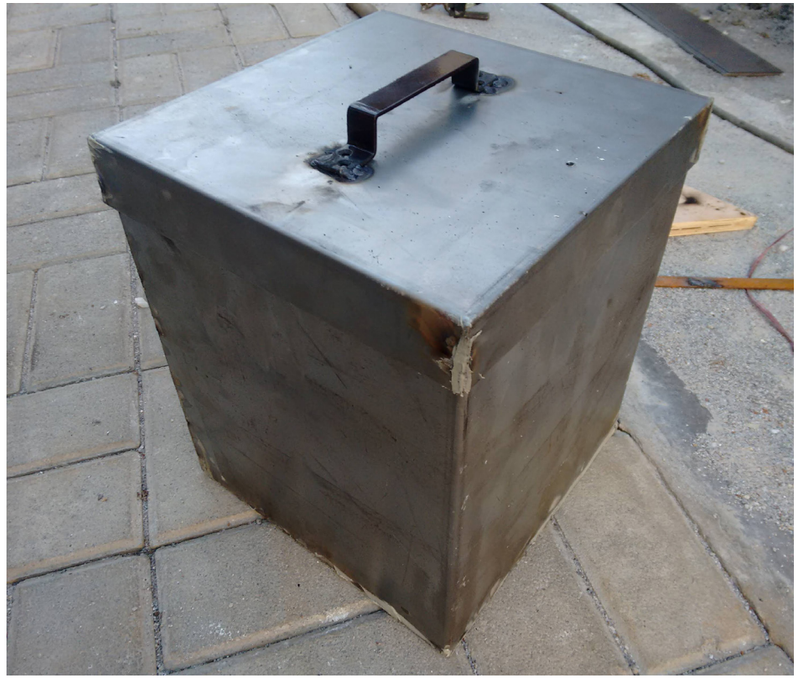
Prototyping



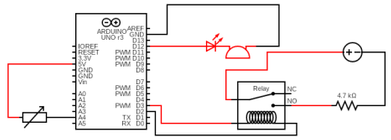


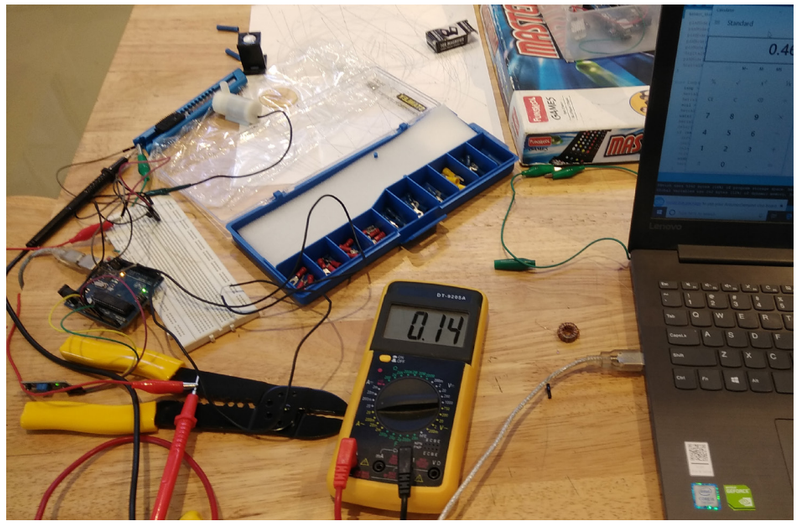
Material Exploration

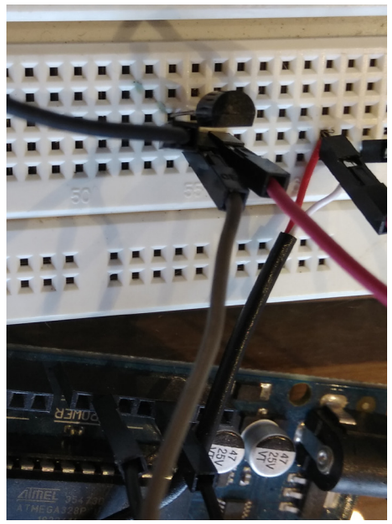


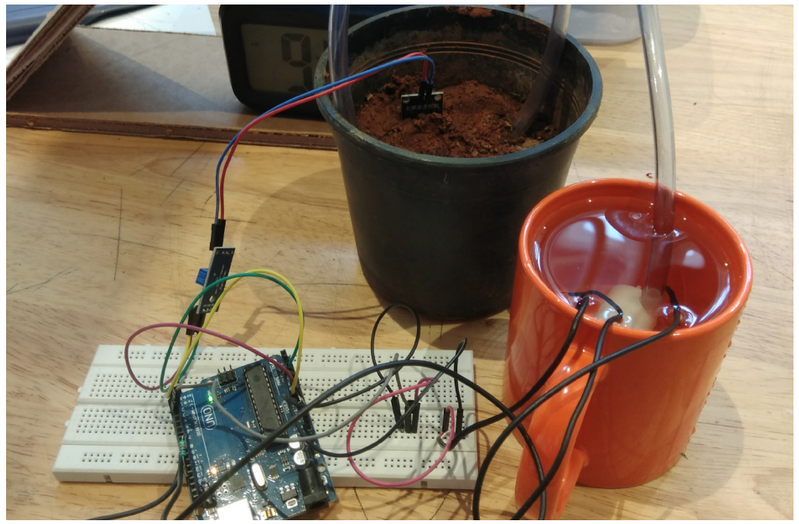


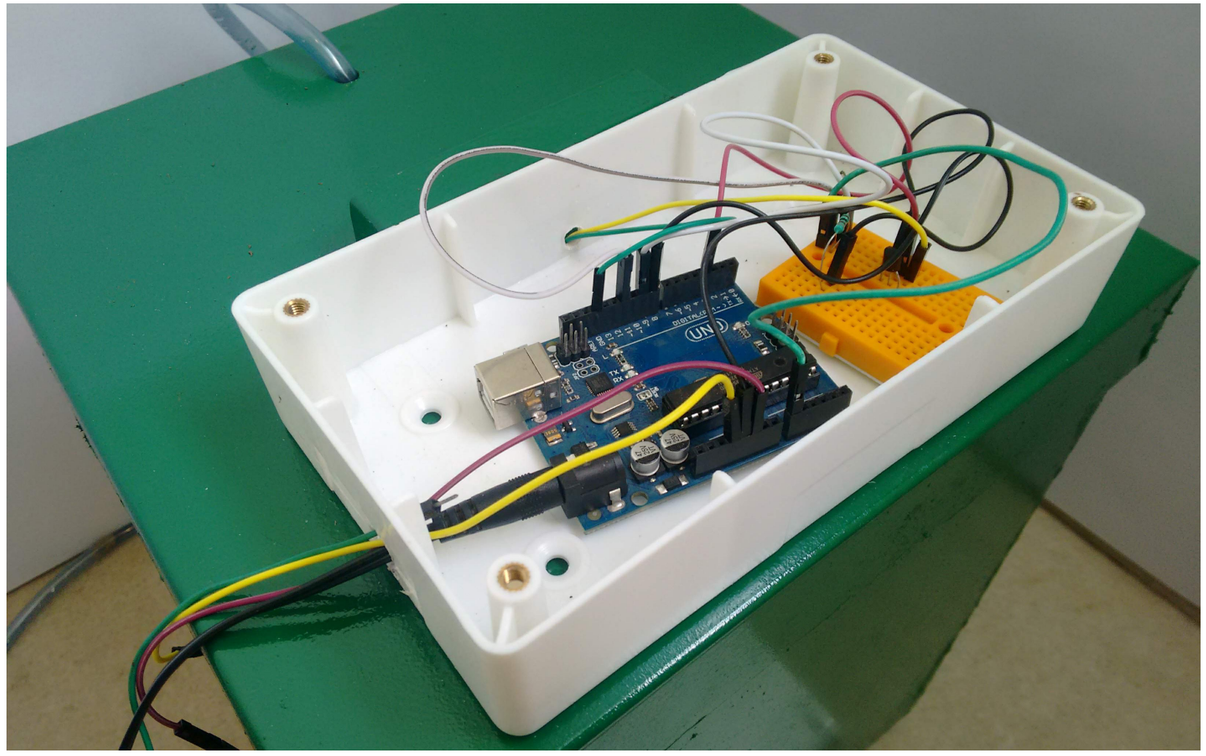
Electronic Prototyping











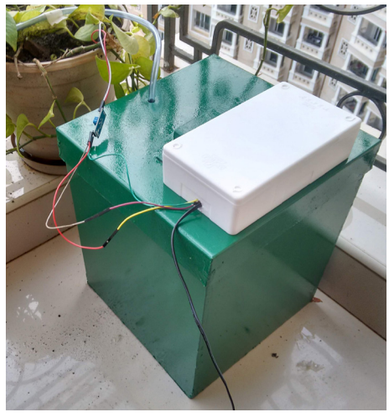
```
}

void loop() {
  temp = dht.readTemperature();
  Serial.print(temp);
  Serial.print(" ");
  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
    }
  }
```

```
0
nan 988.00
0
nan 996.00
0
nan 995.00
0
nan 996.00
0
nan 996.00
0
nan 999.00
0
nan 998.00
0
```

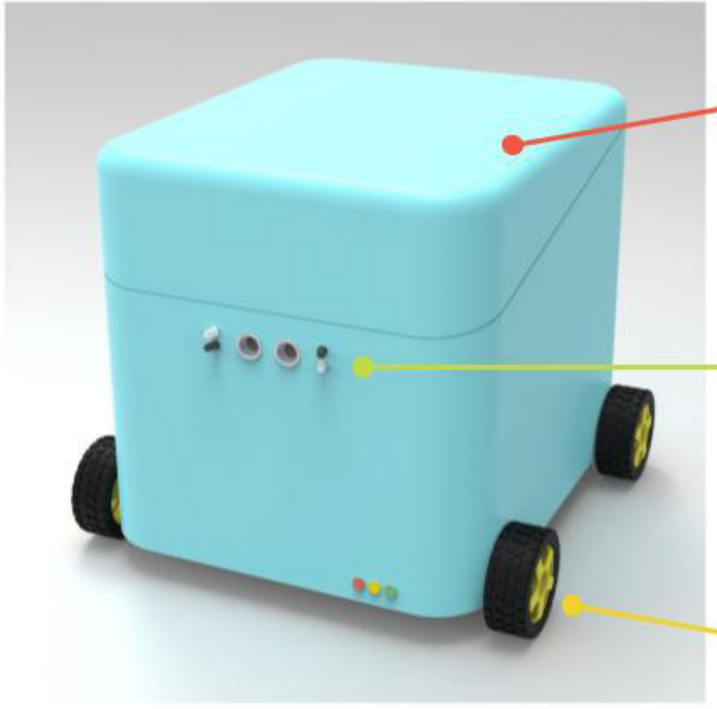
Autoscroll Show timestamp

Finishing



The Cooler Robot

Product Architecture



Cooler

Insulated box to store beverages

Circuits

Controls the motors based on sensor inputs

Wheels

Wheels driven by motors to move the robot around

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.

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

3. Place Beverages

4. Close lid

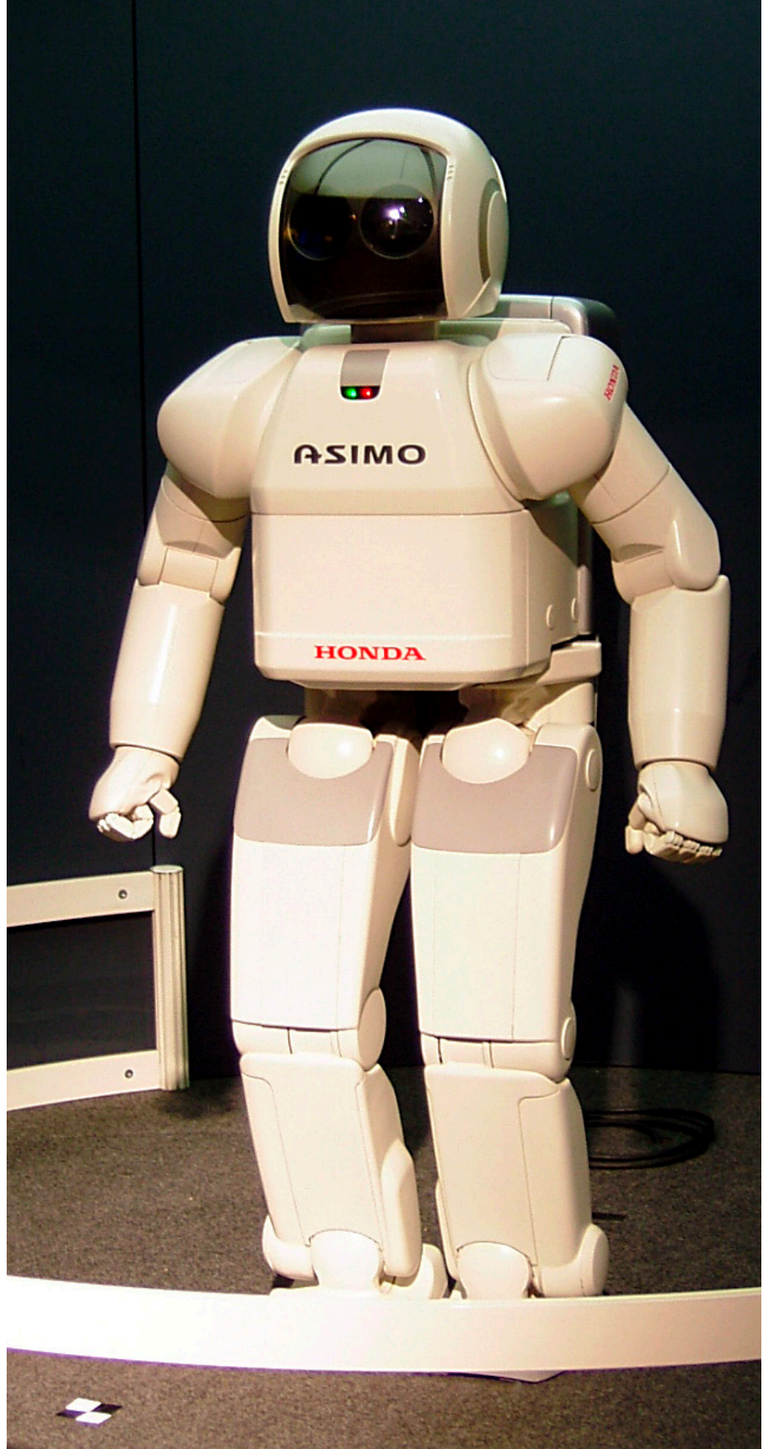
5. Trigger Robot

6. Select Mode

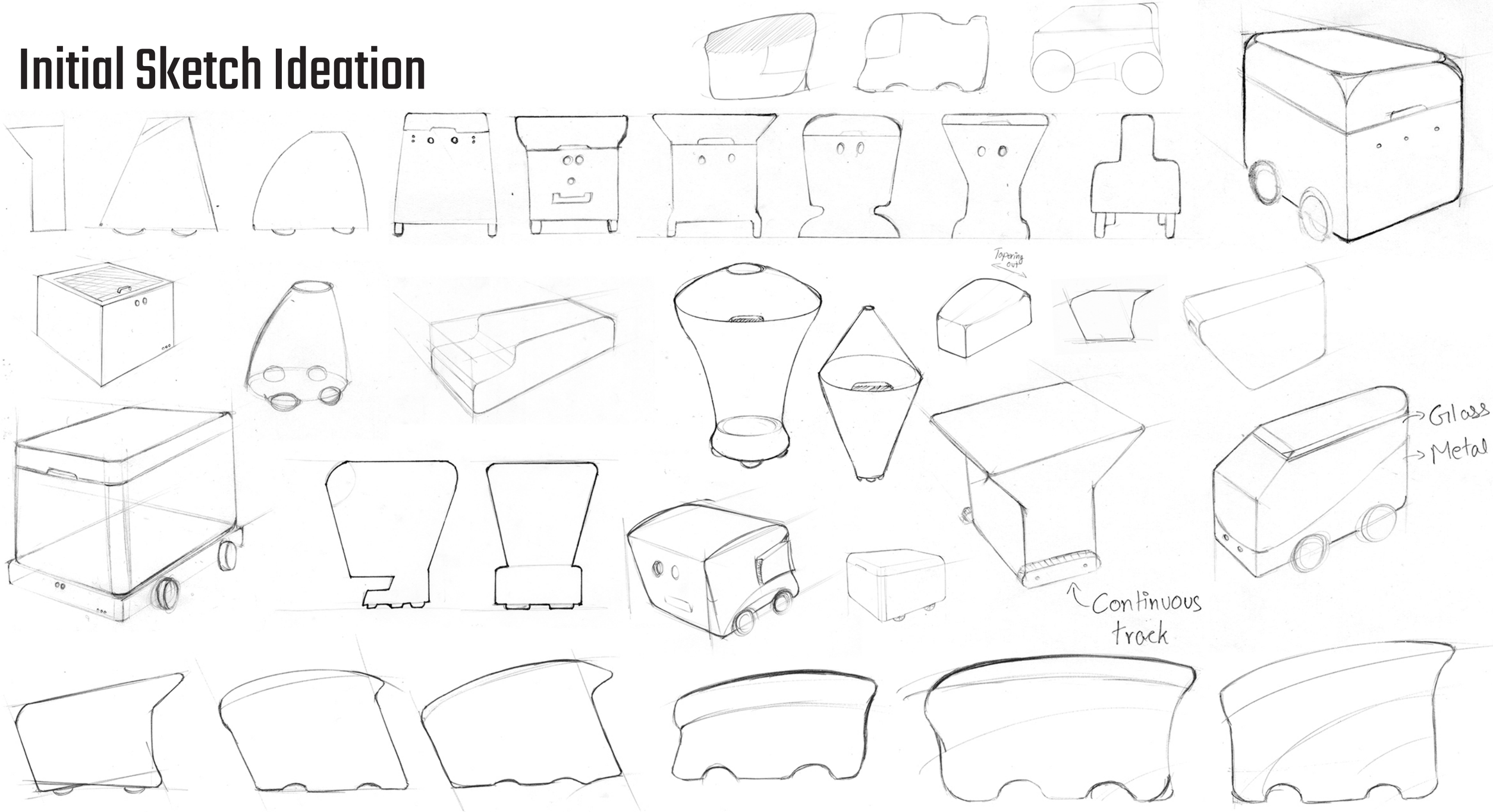
7. Use Robot

8. Clean Robot and Store

Inspiration

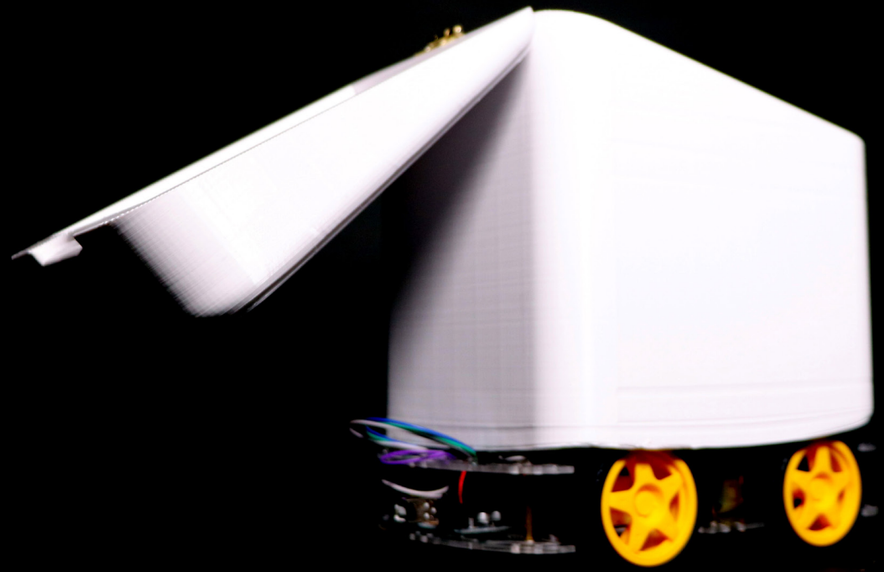


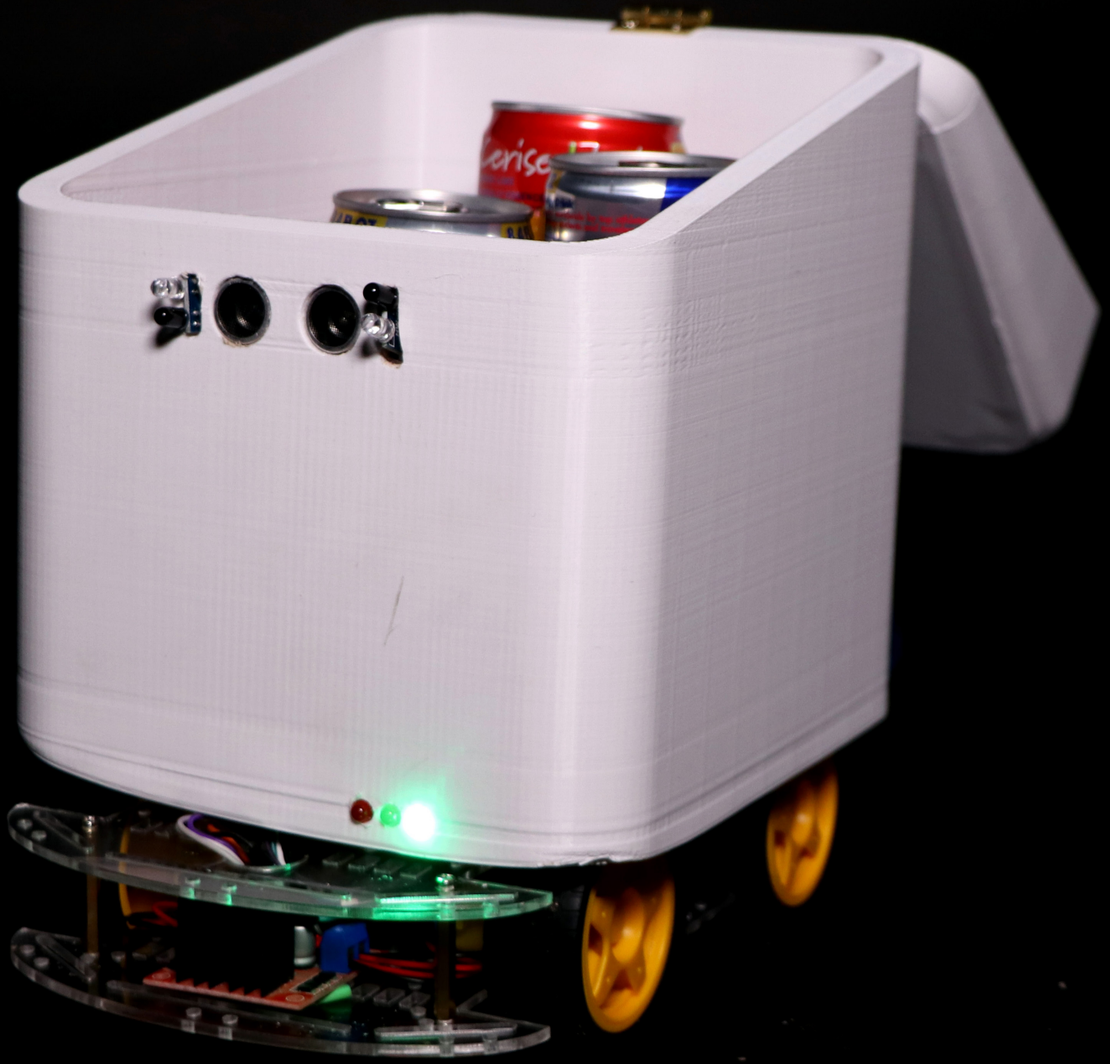
Initial Sketch Ideation



3D Printed
Working Prototype

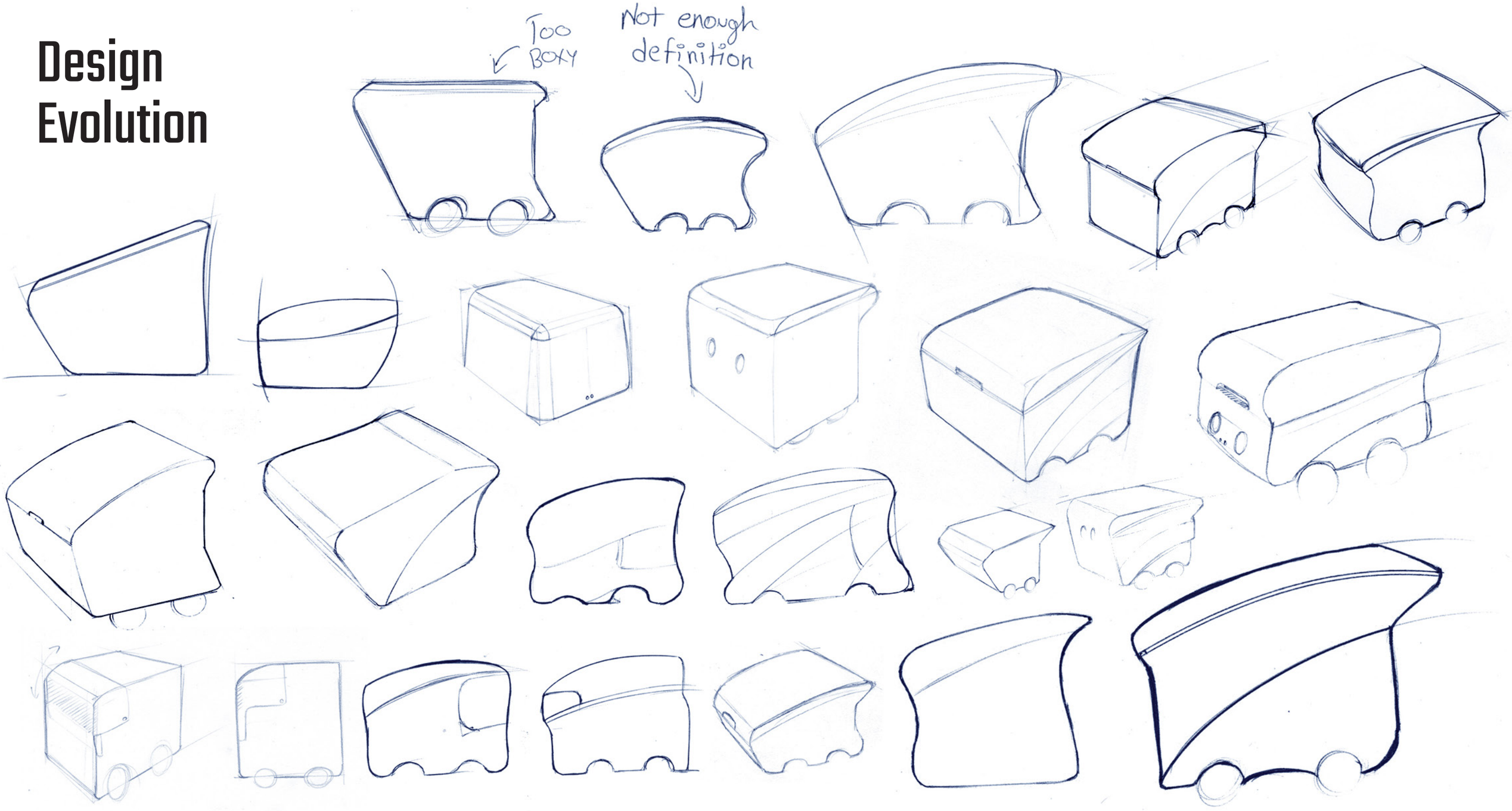
Prototype Testing





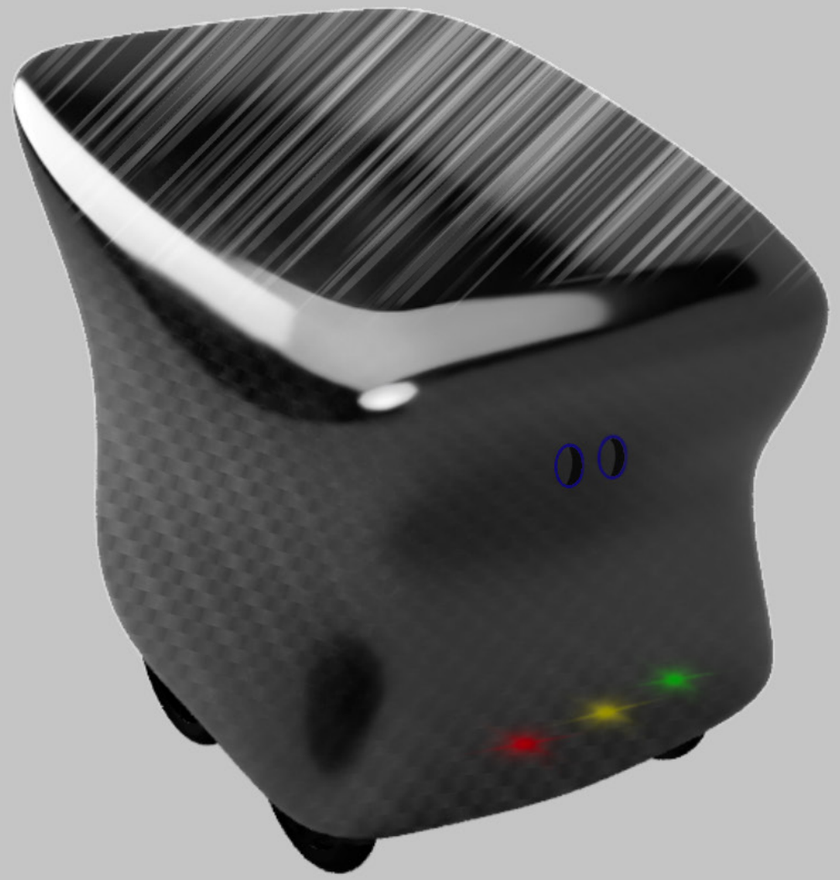
1/4 Scale Prototype

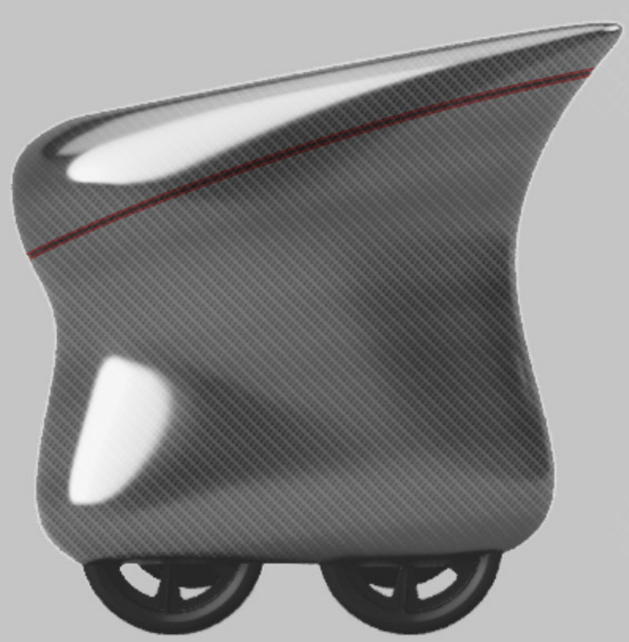
Design Evolution

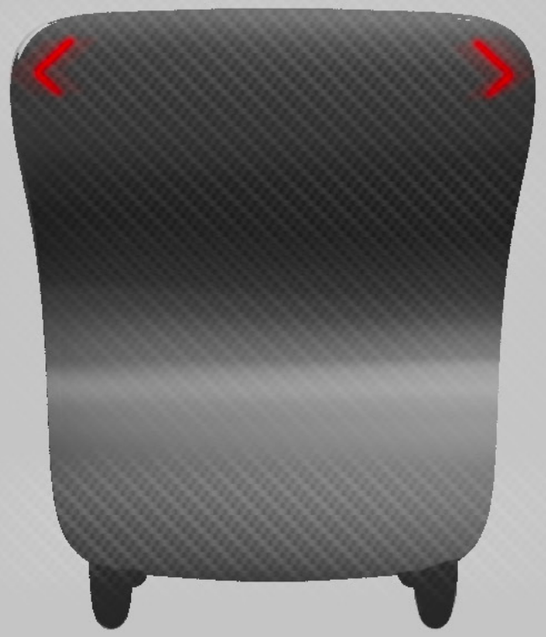


3D Evolution

Concept Render







The Cooler House


Cerise Lim
CHERRY LIME
8.4 FL OZ