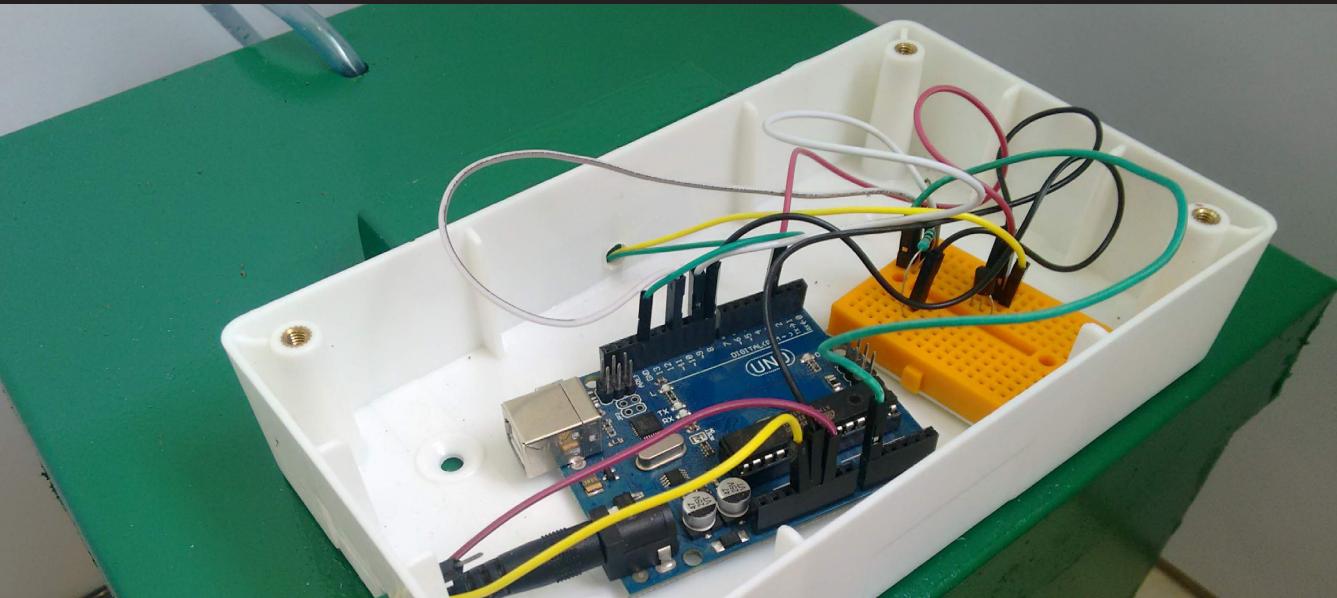


# Eureka

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## 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

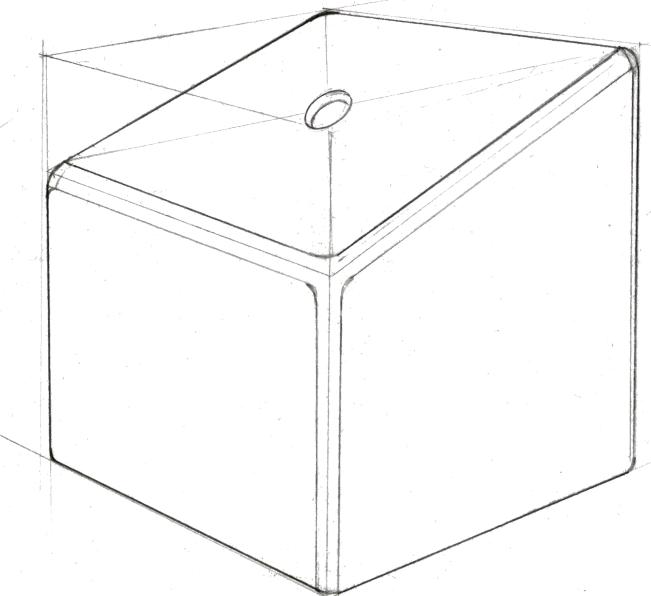
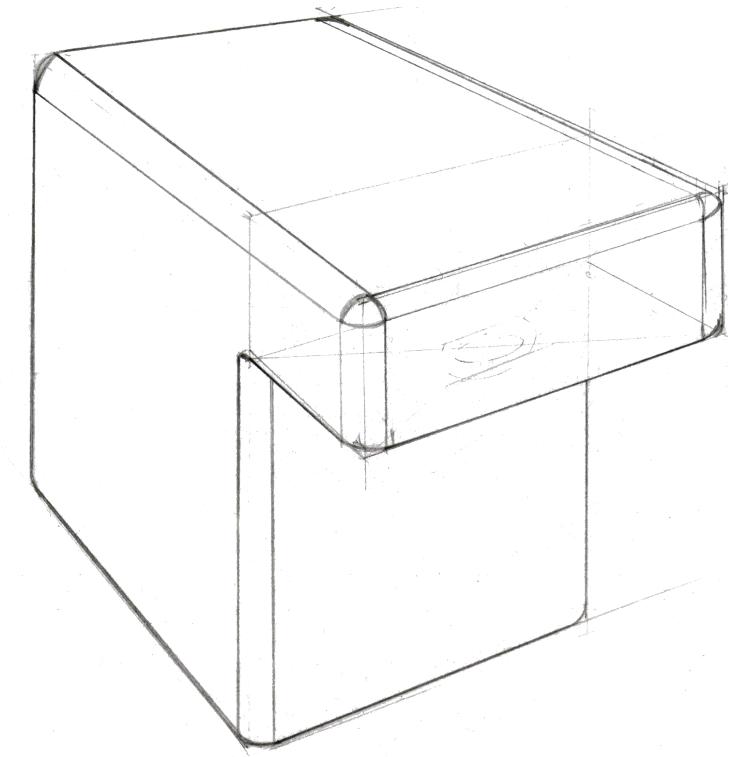
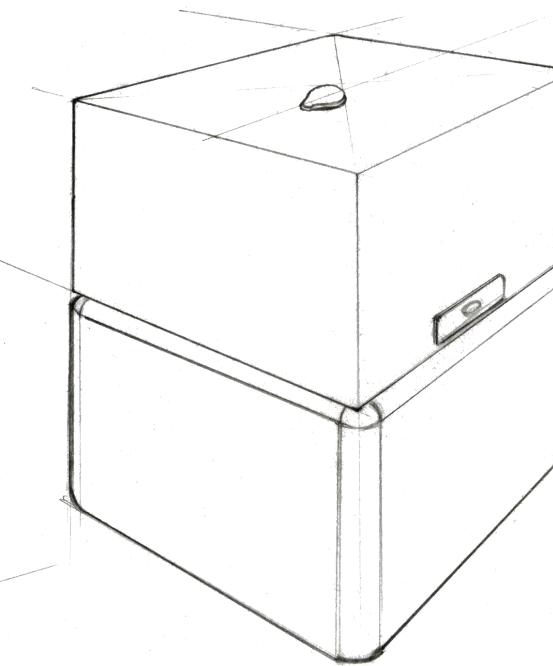
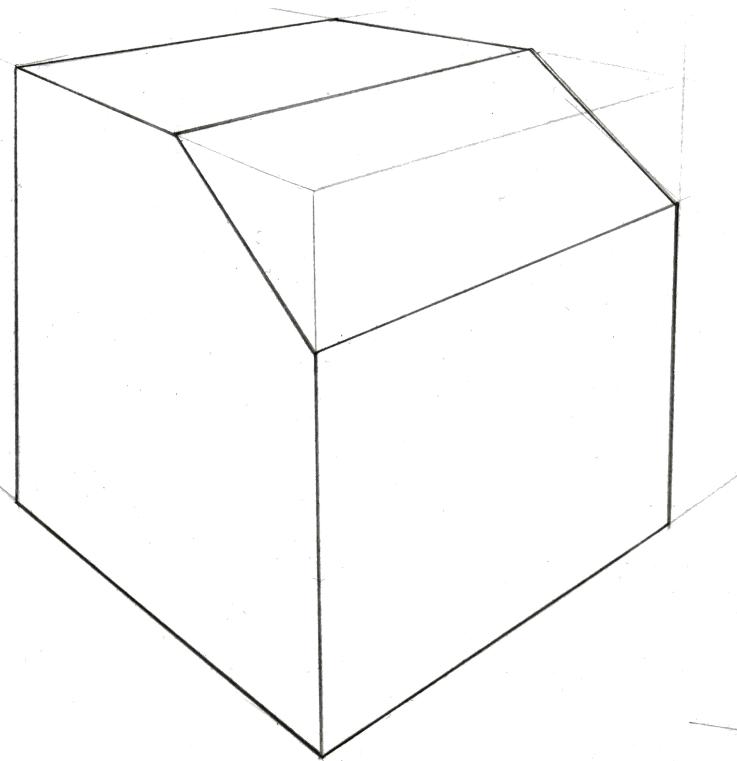
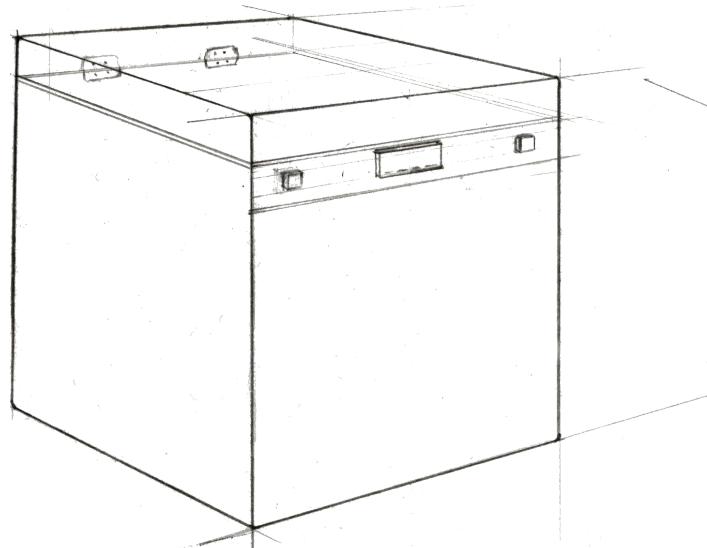
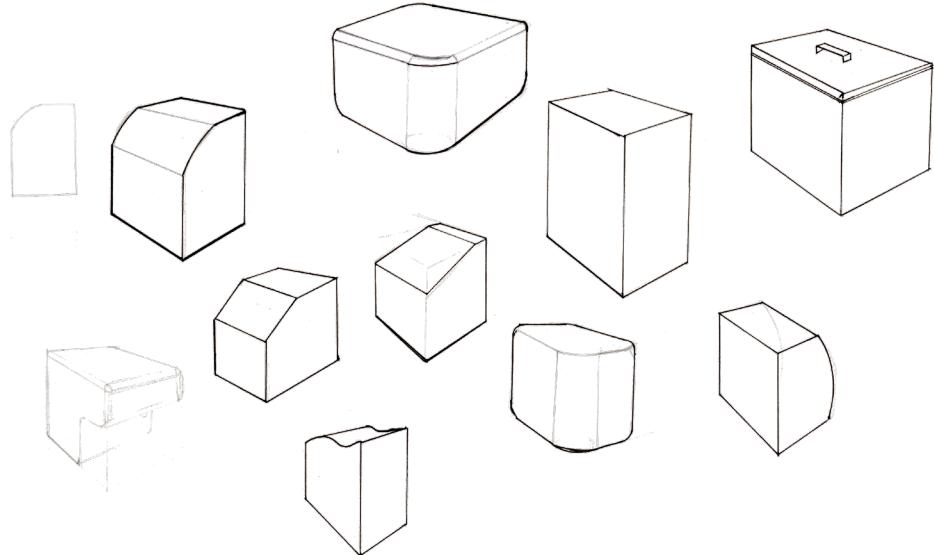
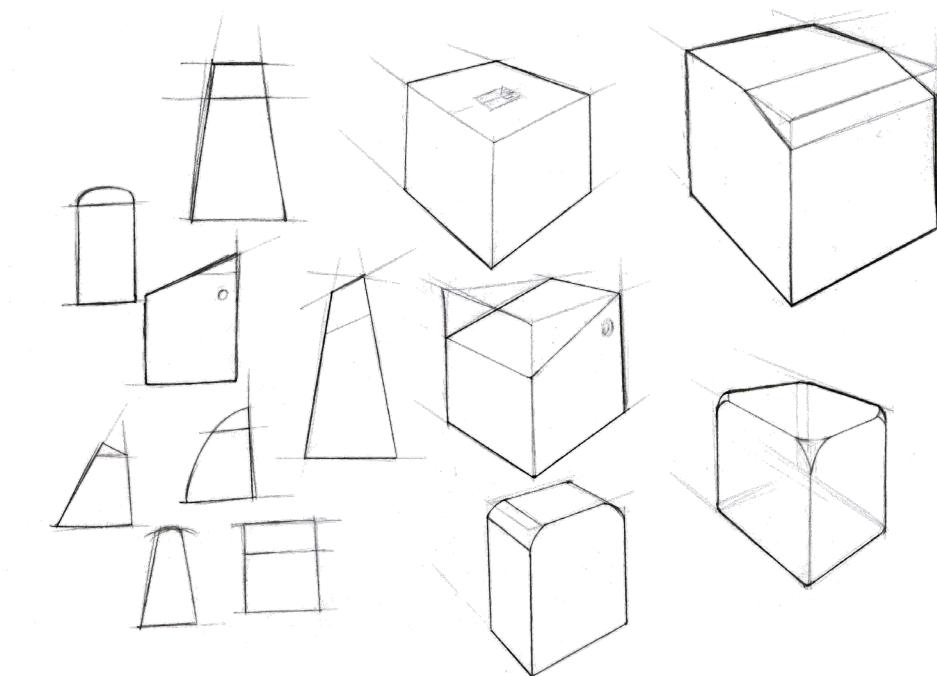
### Disadvantages:

Requires a constant pressurized water supply

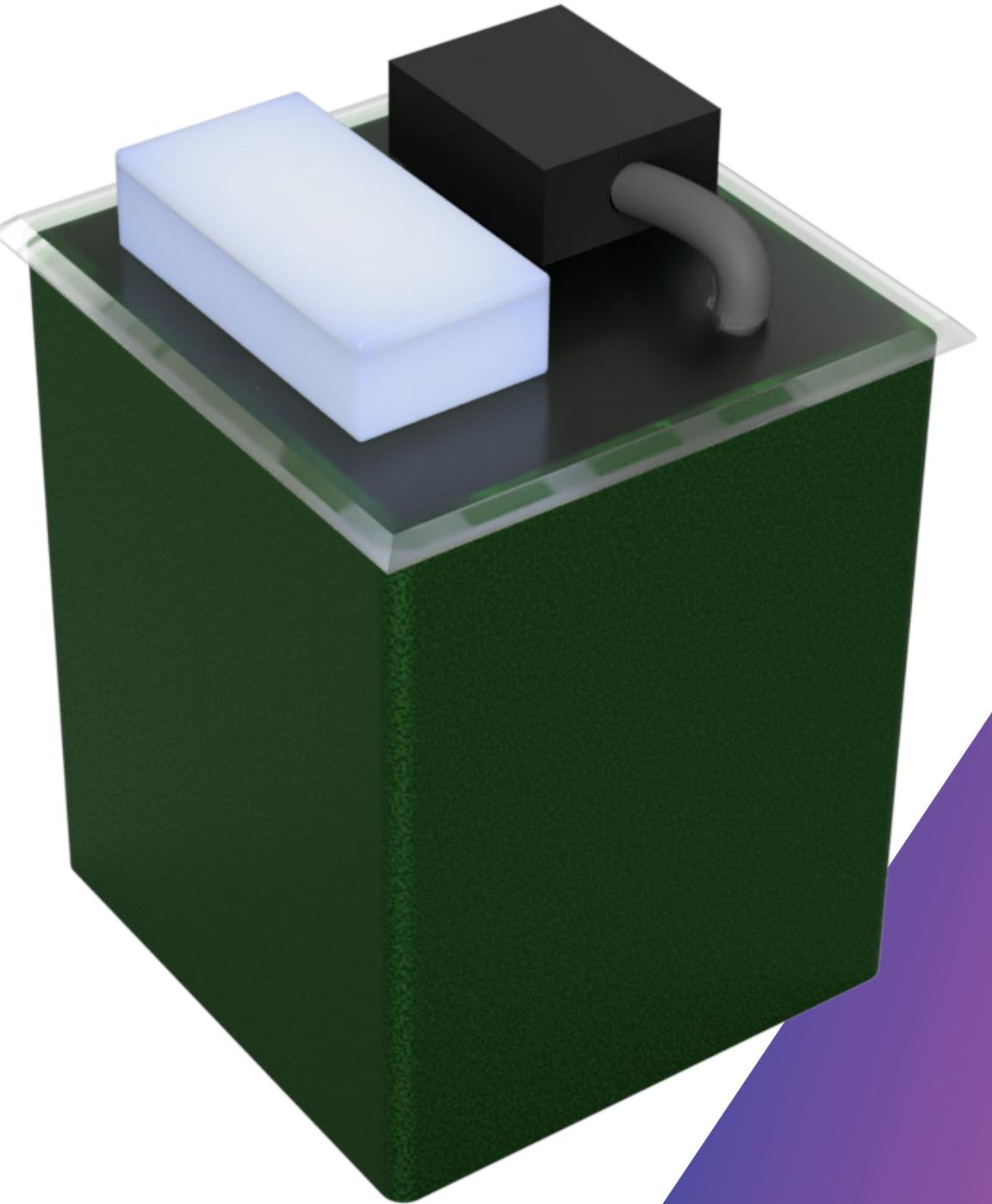
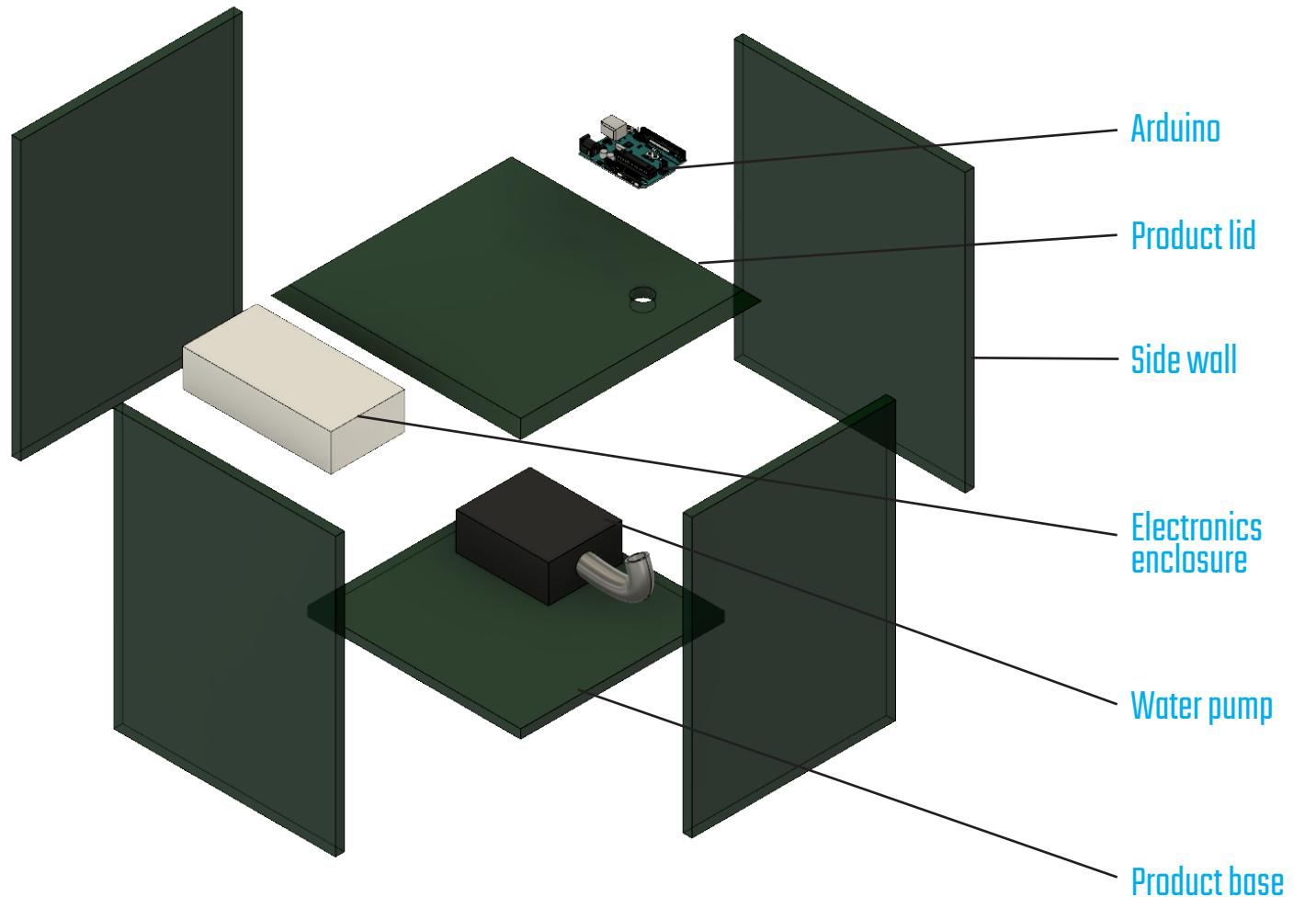
Expensive (\$130 for an area of up to 75 square feet)

User set watering frequency, not based on soil humidity

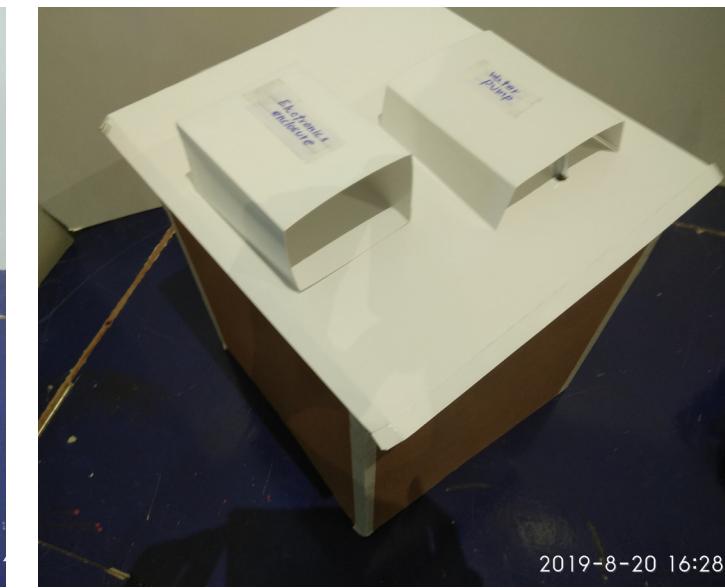
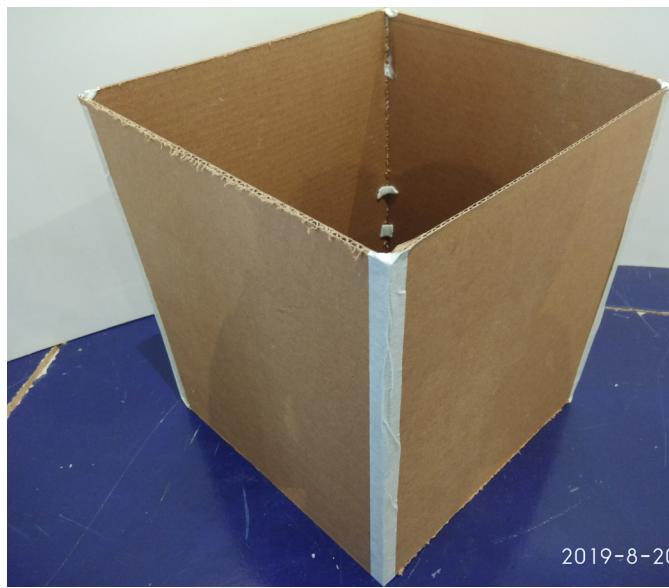
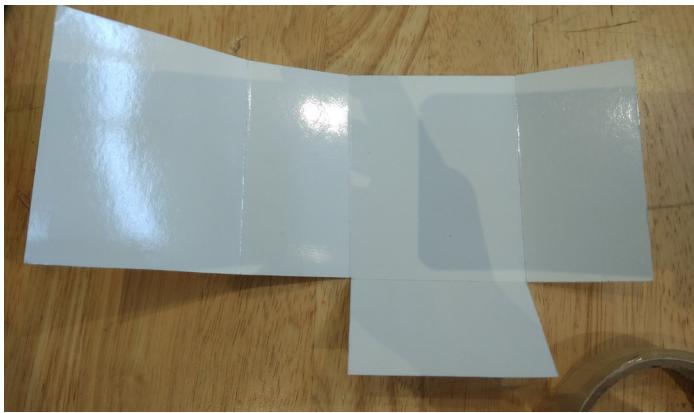
# Sketch Ideation



# Product Visualization



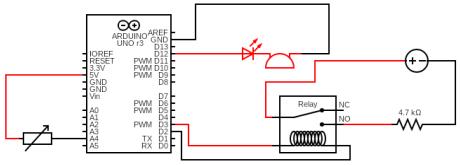
# Prototyping



# Material Exploration

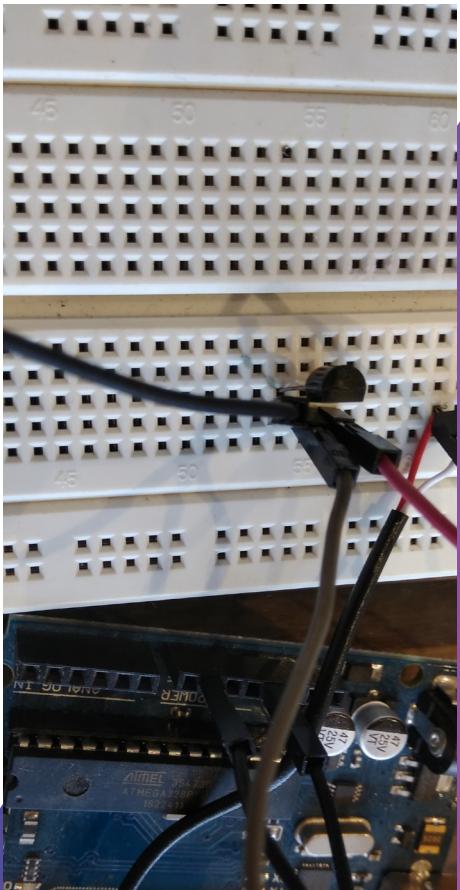
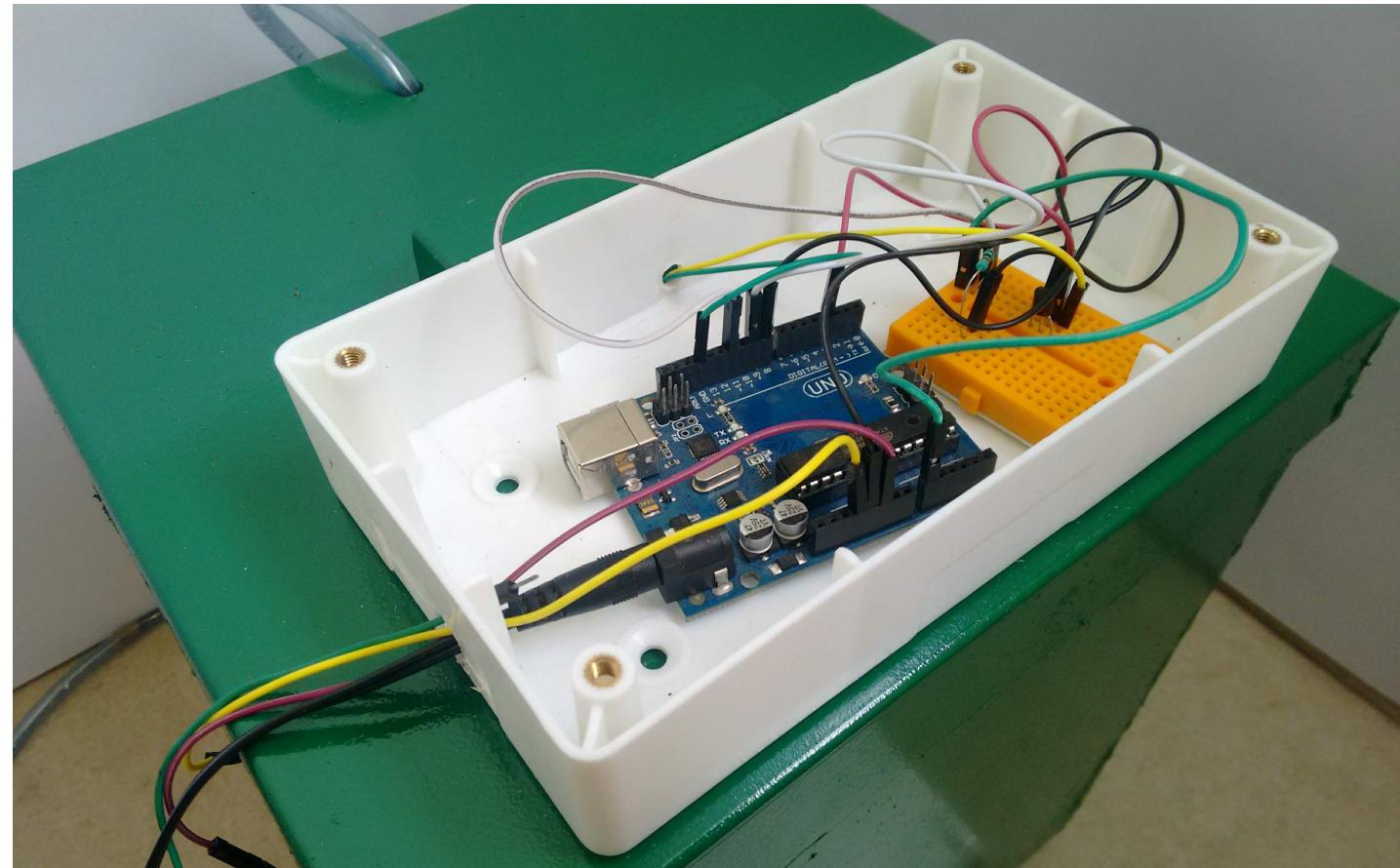
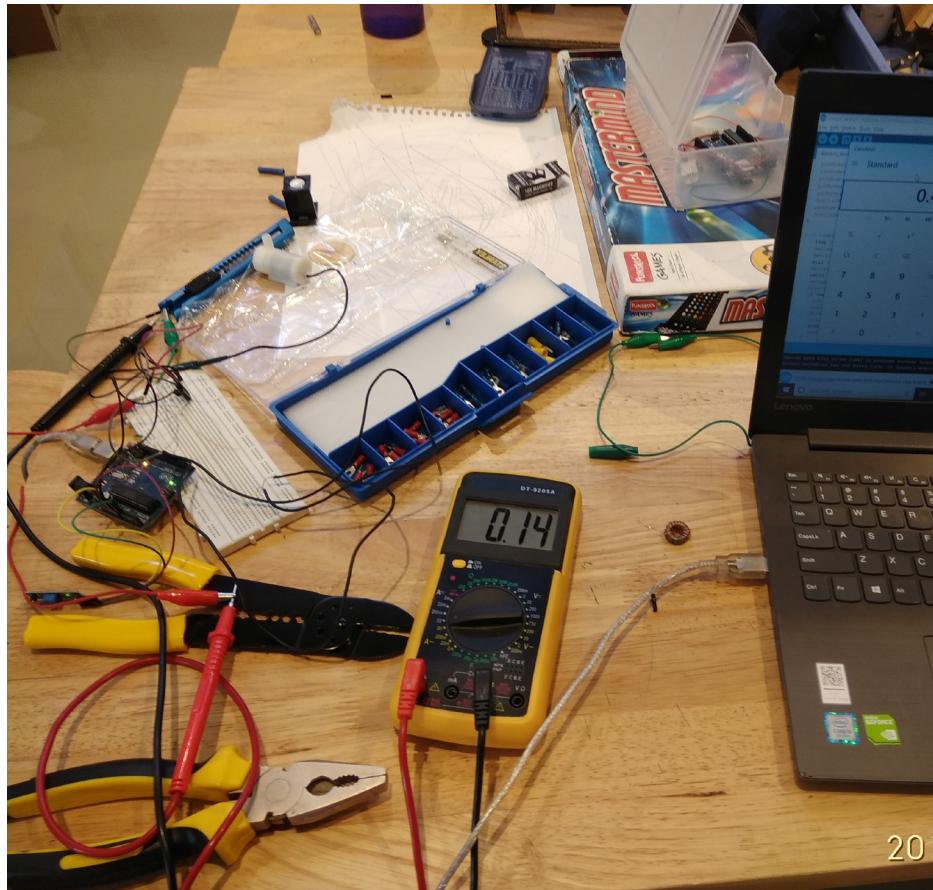
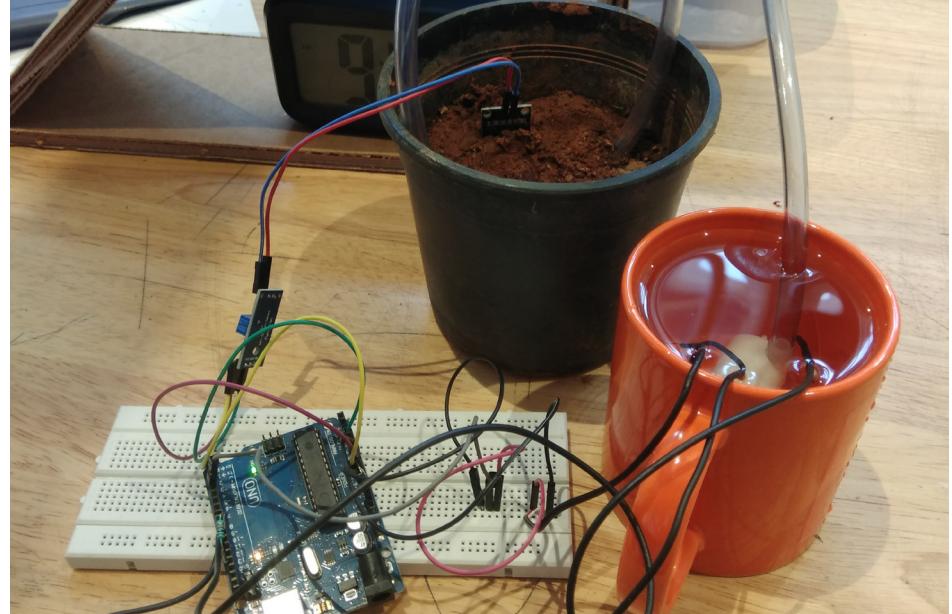


# Electronic Prototyping



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:");  
 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, soil moisture from an analog pin, and checks a digital pin for water level. It also includes logic to enable a water pump if soil is dry and water is present. The serial monitor shows the data being printed.



# Finishing



# VeBike

**Enabling enthusiasts and DIY builders to  
make their own electric bike**



# Who is it for?



Mark Martensen



New York, USA

Environmentalist



Energetic

World Traveller



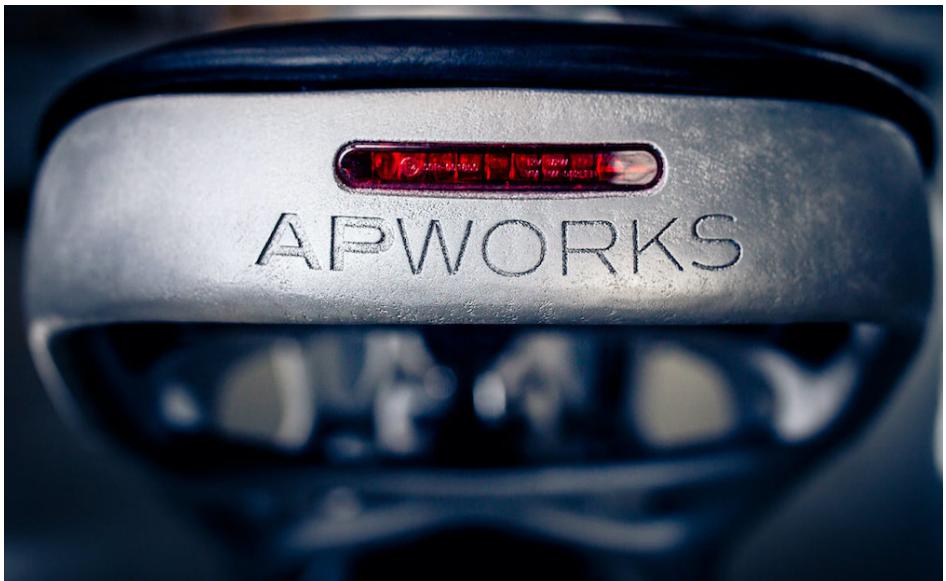
Entrepreneur

Video Blogger

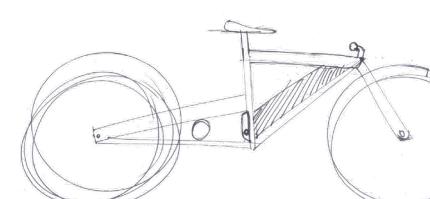
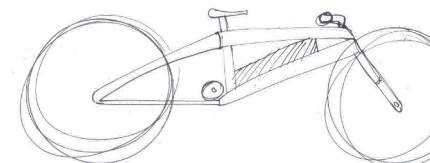
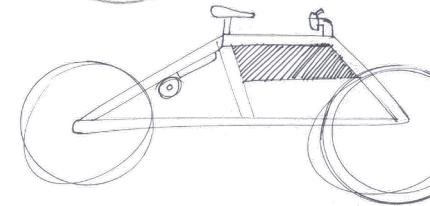
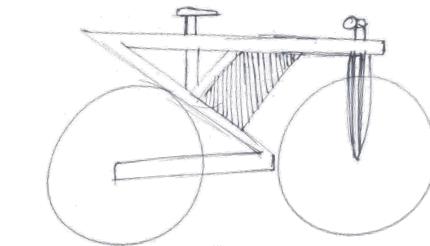
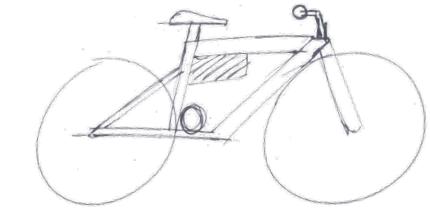
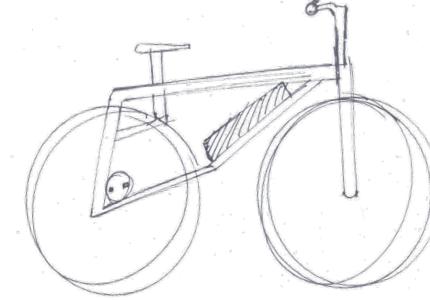
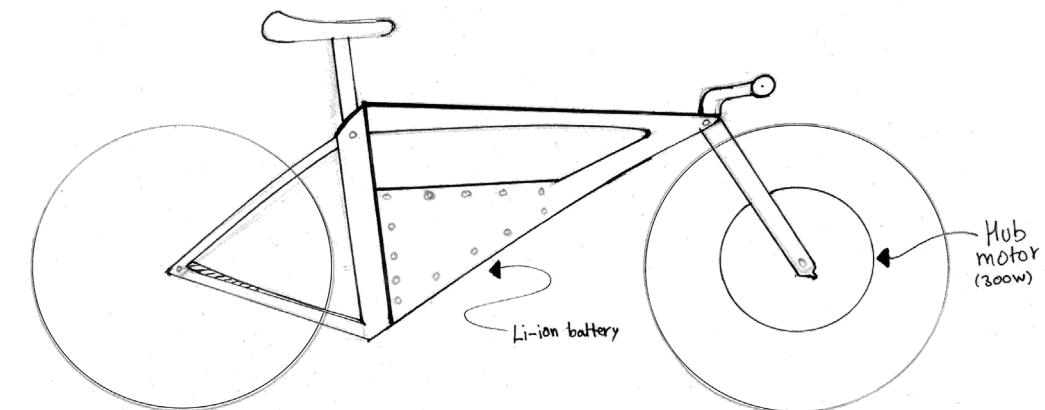
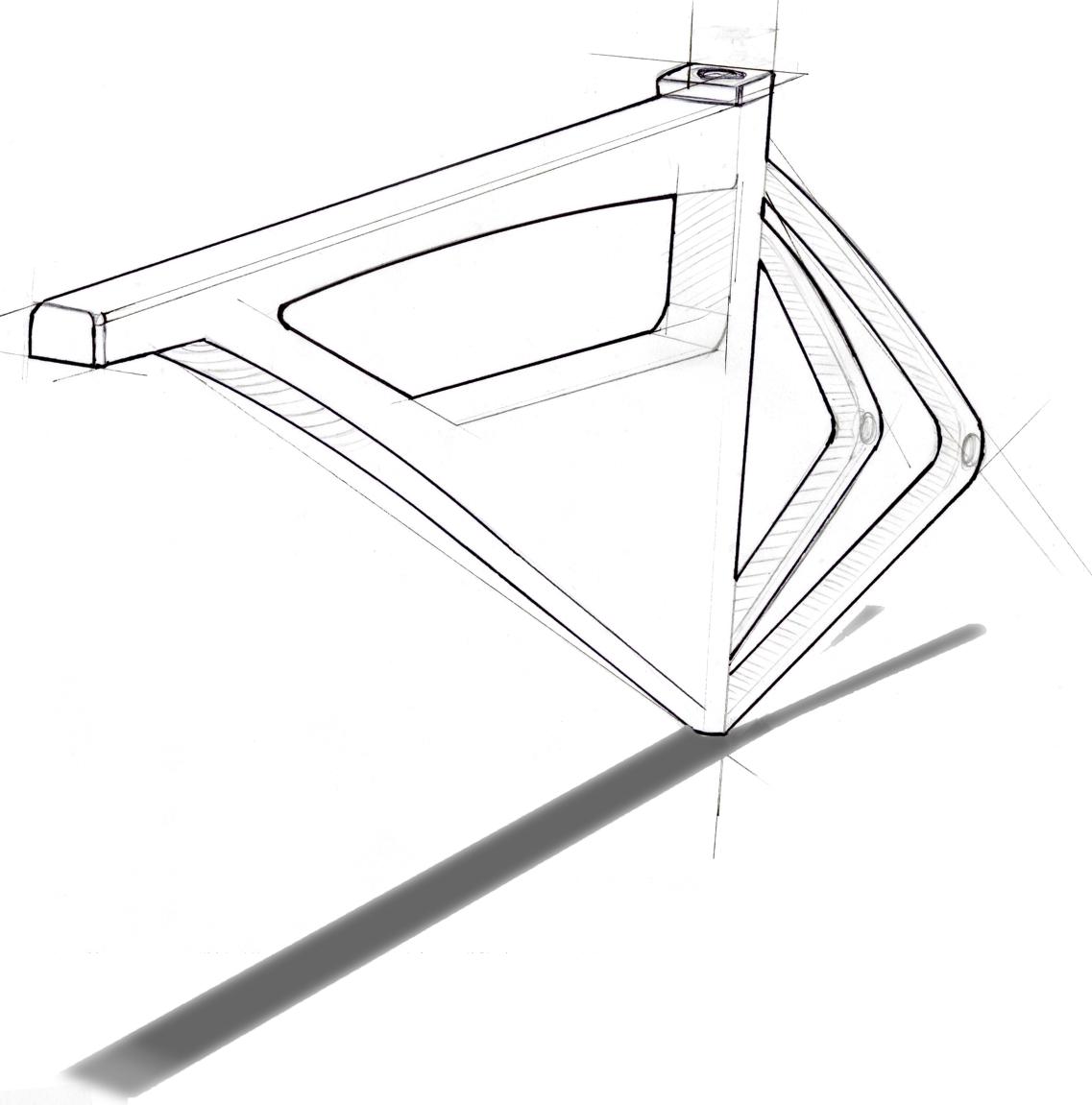
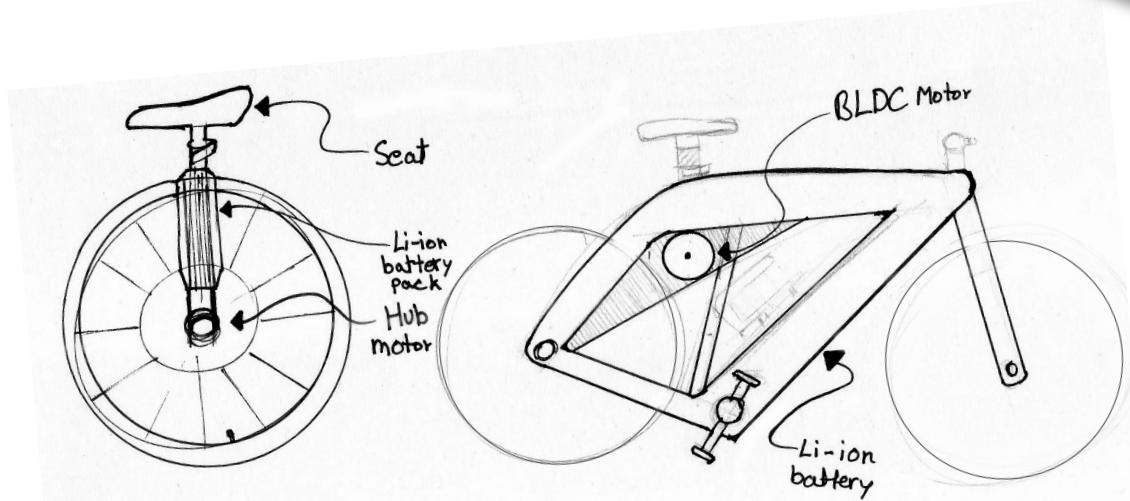
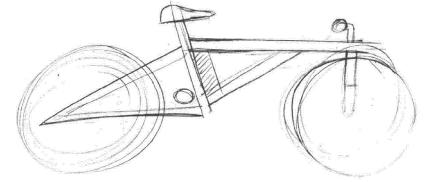
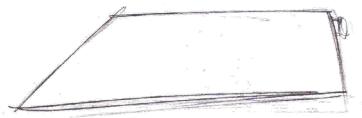
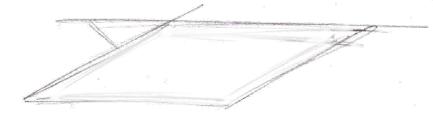
Mark wants to upgrade his bike by making his own e-Bike



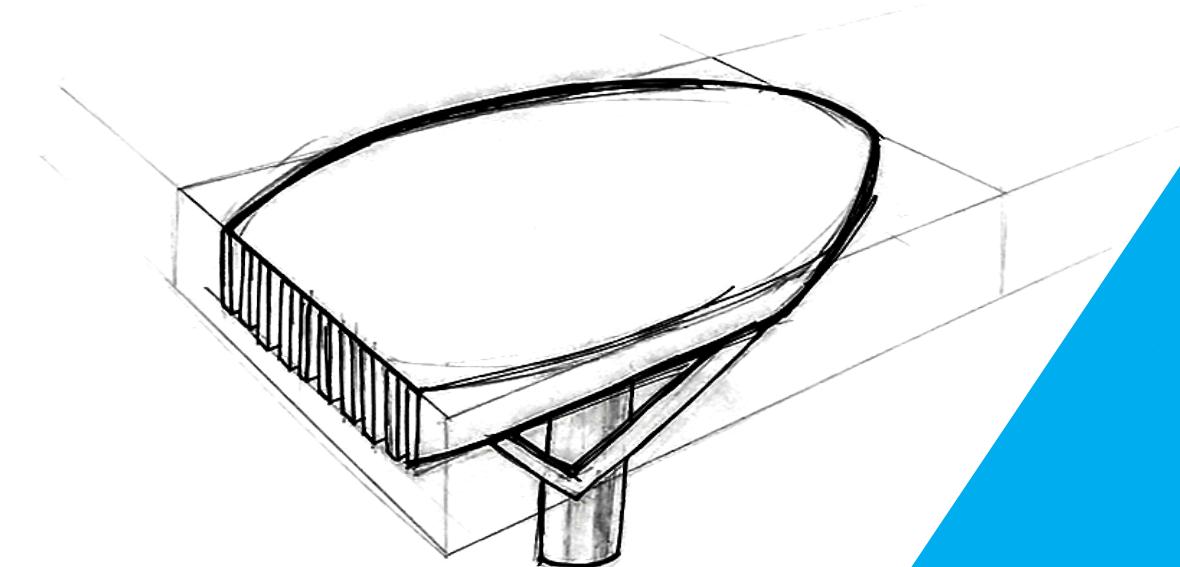
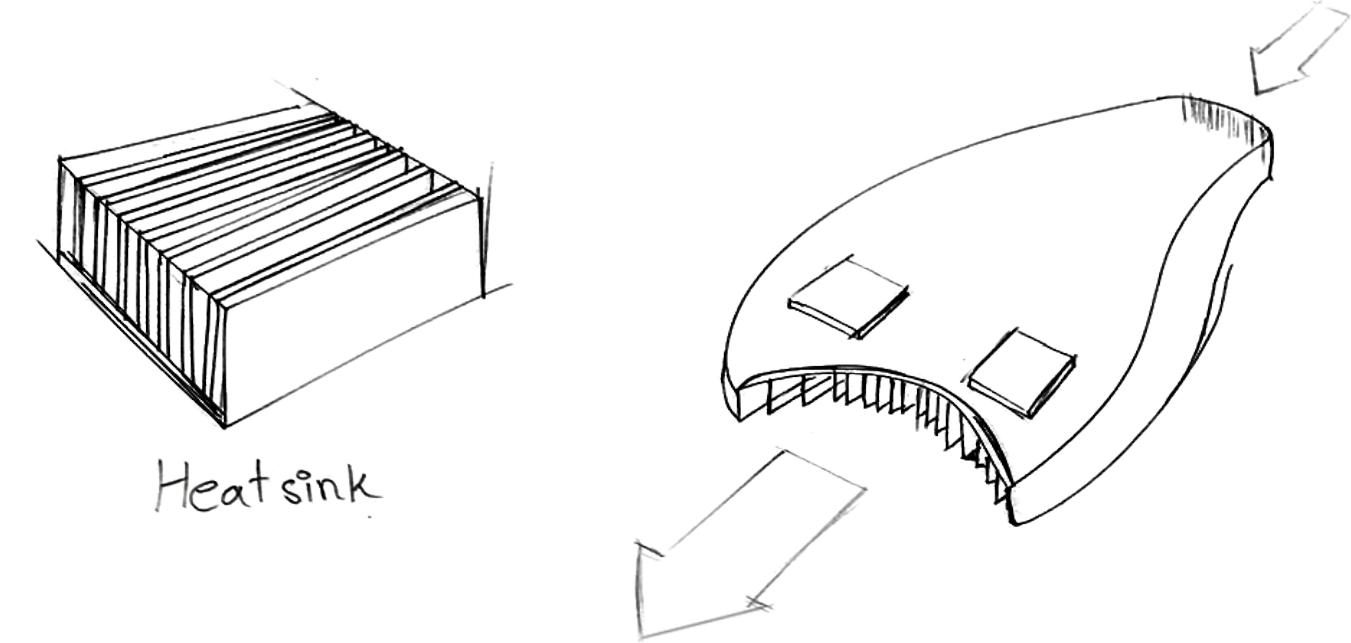
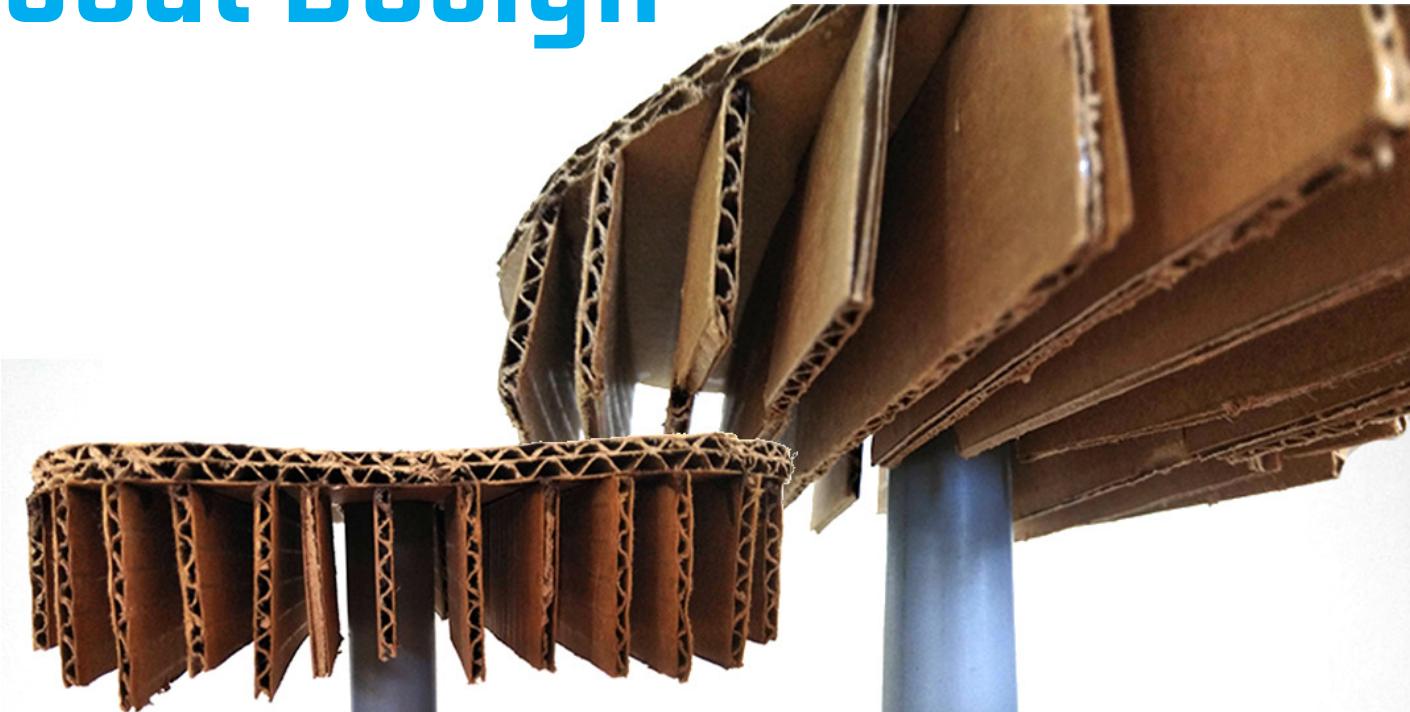
# Inspiration



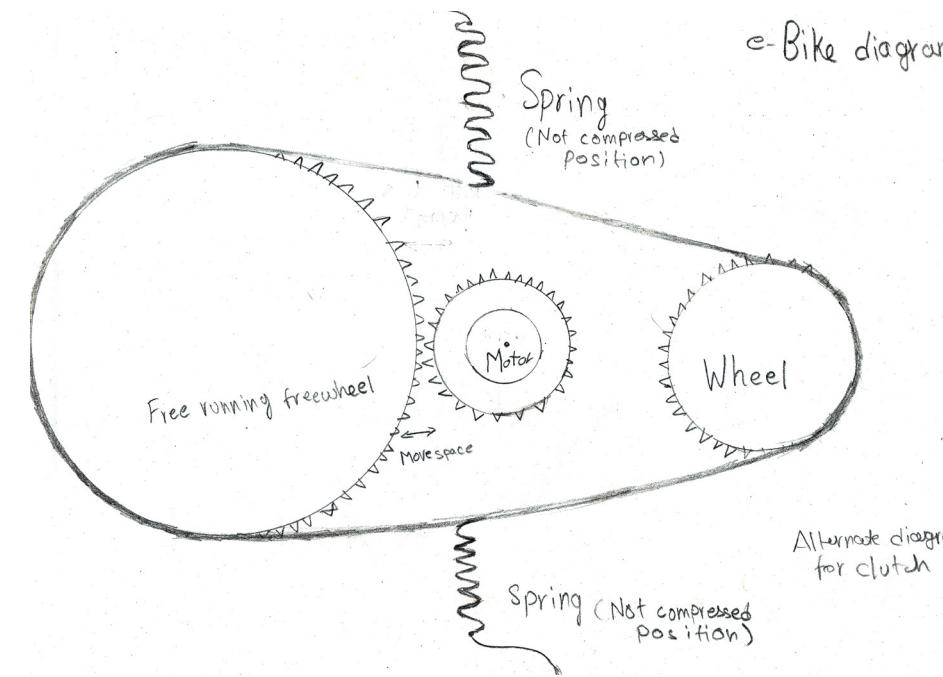
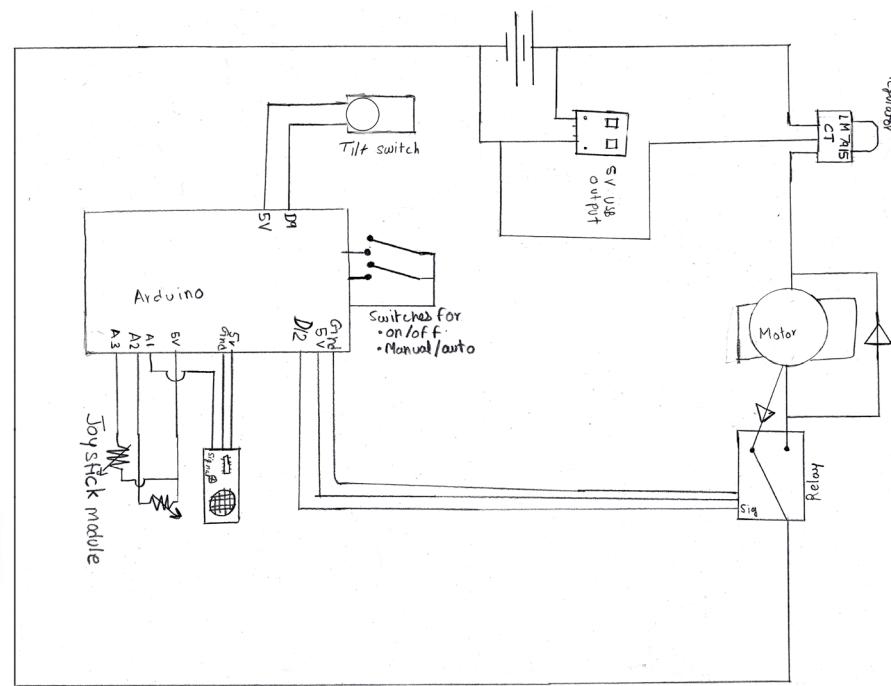
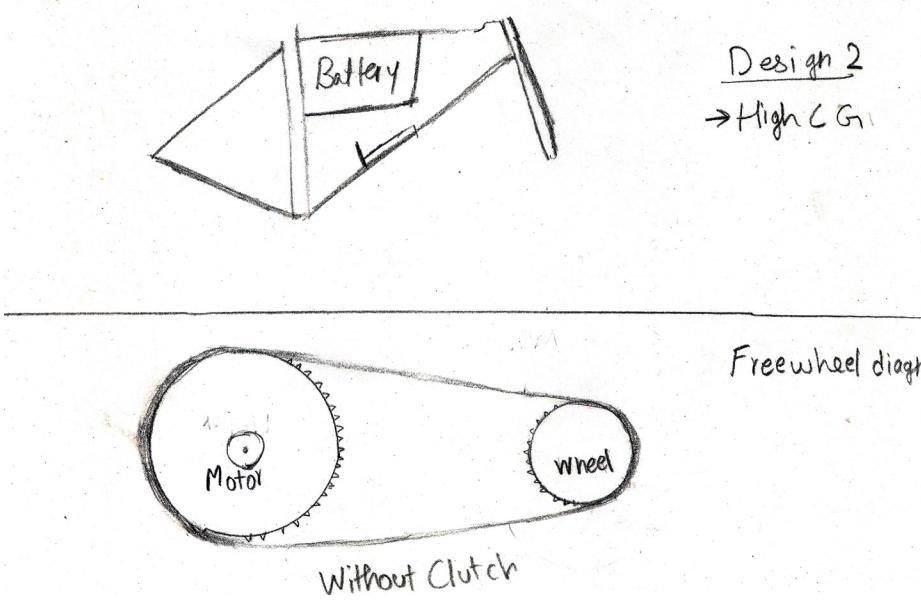
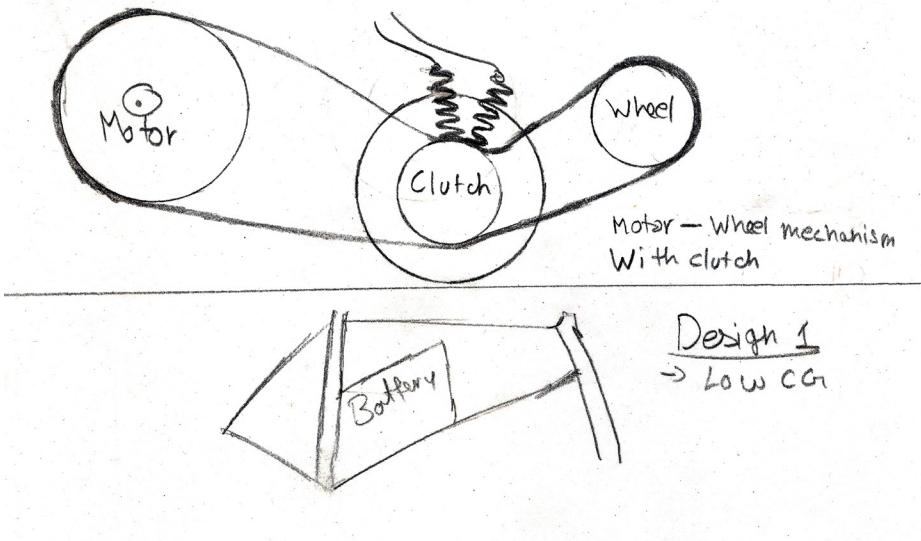
# Sketch Ideation



# Seat Design

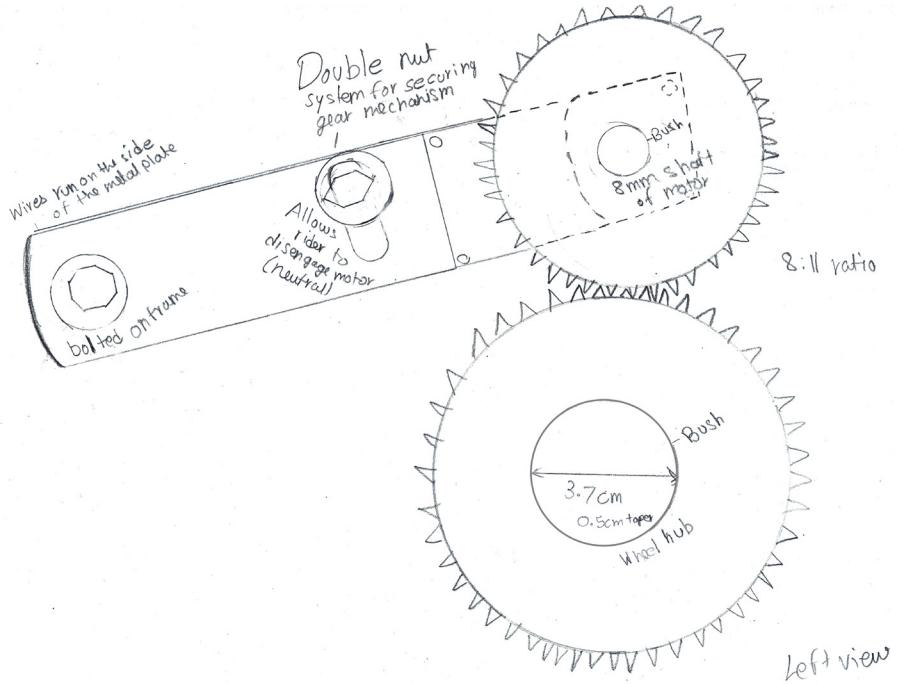


# Engineering the Bike

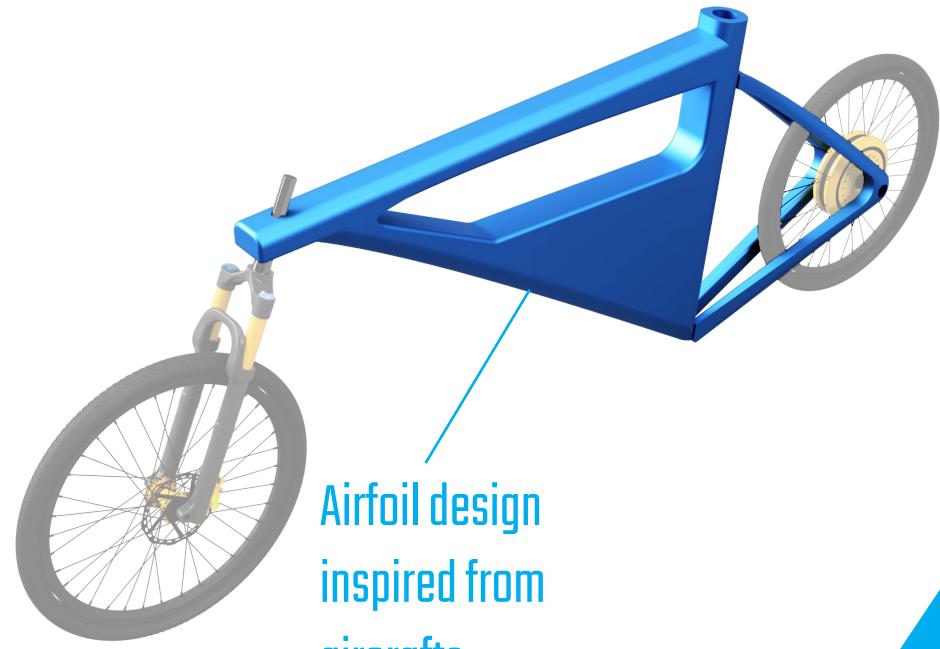
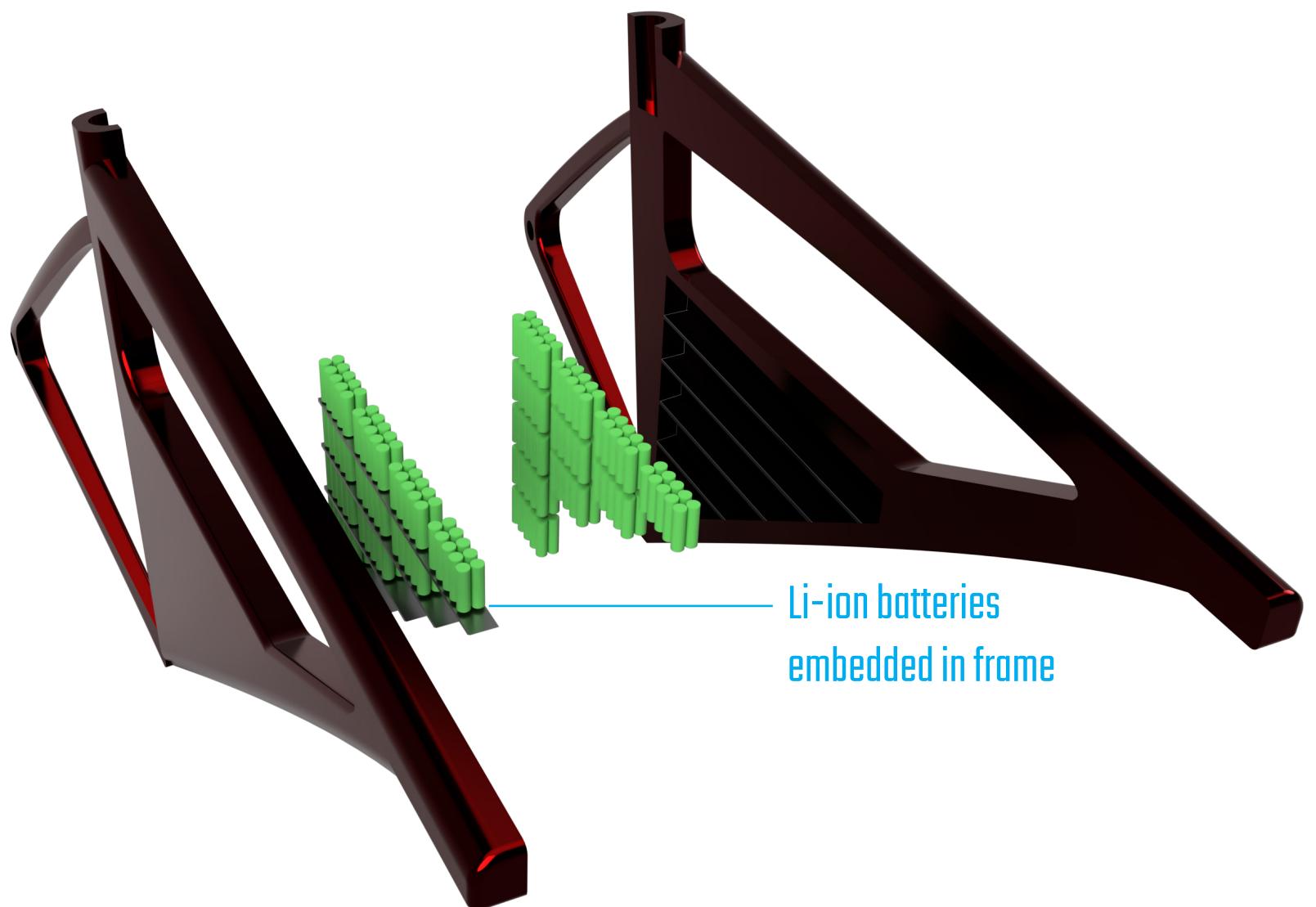


# How it Works

- A 200W DC motor powers the rear wheel, connected through gears with a 8:11 gear ratio
- Two 7Ah 12 Volt Batteries power the bike
- An Arduino is used to take sensor input, and joystick input to control the motor through a motor driver



# Design Features



# VeBike

