# THE PROBLEM

33-50% of global food produced is wasted, thrown into the garbage or composted without being eaten. The process that brings food from farm to table already involves sundry ways for produce to be cast aside. Yet, the limited amount of produce that arrives in a household is still at risk of waste due to improper ripening methods causing fruit to go bad before the buyer eats it.

# WHY WOULD WE WANT TO WORK ON THIS TOPIC?

Food waste, which is the single largest component going into municipal landfills, quickly generates methane, helping to make landfills the third largest source of methane in the United States. The value of this wasted food is worth over $1 trillion. Meanwhile 800 million people go to bed hungry every night.

# DATA

The U.S. Department of Agriculture reported that, of all the fresh produce purchased by the average home, "25% is thrown away due to decay or becoming overripe." Proper and efficient produce ripening could positively benefit the consumer and our environment by saving money and resources. Due to all this, we hope to reduce the waste of produce in homes that occur simply because buyers allow their food to go to waste.



LOSS OF FOOD AT EACH STEP
GRAIN  SEAFOOD  PRODUCE  MEAT  MILK

PRODUCTION
STORAGE
PROCESSING
RETAIL
CONSUMER

Product focus

http://www.justineburt.com/the-secret-life-of-sustainability/food-waste-at-each-life-cycle-stage

# COMPETING PRODUCTS



**BLUE APPLE**
Average Cost: $9.99 (per 2)
Aesthetic: 7 / 10
High / Low Tech: 4 / 10
User Friendliness:  8 / 10



**FOOD HUGGERS**
Average Cost: $10
Aesthetic: 8 / 10
High / Low Tech: 2 / 10
User Friendliness:  5 / 10

**REUSABLE PRODUCE BAGS**
Average Cost: $8.99
Aesthetic: 7 / 10
High / Low Tech: 3 / 10
User Friendliness:  9 / 10



**PRODUCE SAVER CONTAINER**
Average Cost: $9.99 (per one)
Aesthetic: 4 / 10
High / Low Tech: 3 / 10
User Friendliness:  5 / 10



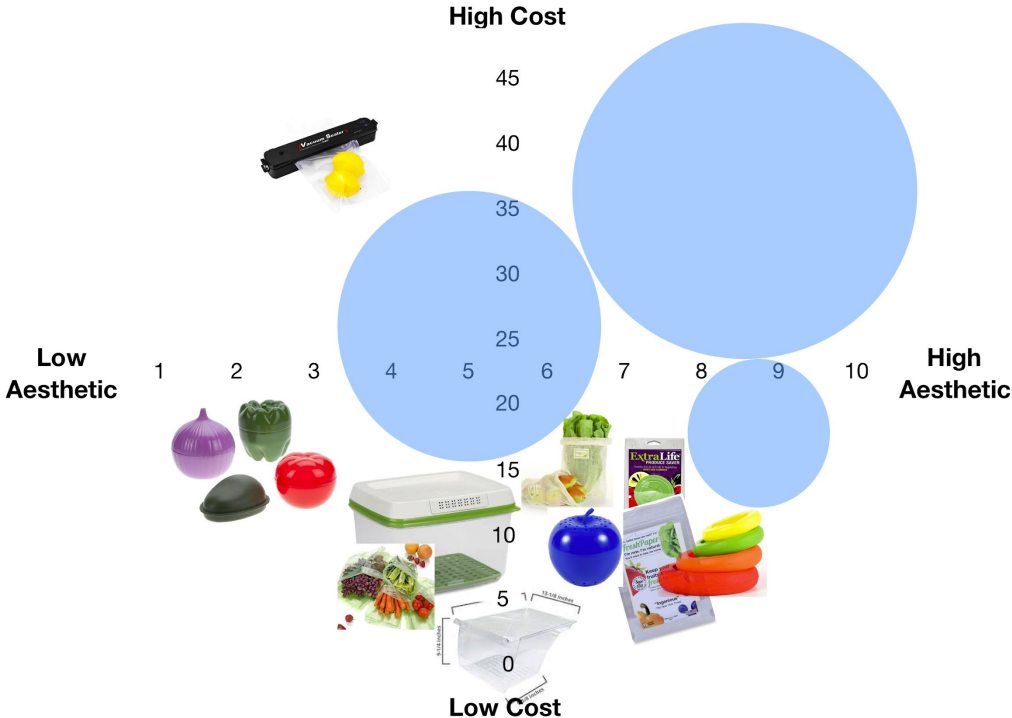**PRODUCE SAVER SHEETS**
Average Cost: $7
Aesthetic: 9 / 10
High / Low Tech: 1 / 10
User Friendliness:  9 / 10

# MARKET GAPS

According to the first graph, there are gaps for a luxury brand sort of Produce Savers, a product that would be expensive and looks nice as well as one that is moderately priced (around $15-30) that is not so attractive.

# MARKET GAPS

The other graph shows a gap where a product that is high tech but user-friendly, one that is high tech, but not very user friendly, and one that is not at all user-friendly but with an average amount of complexity.
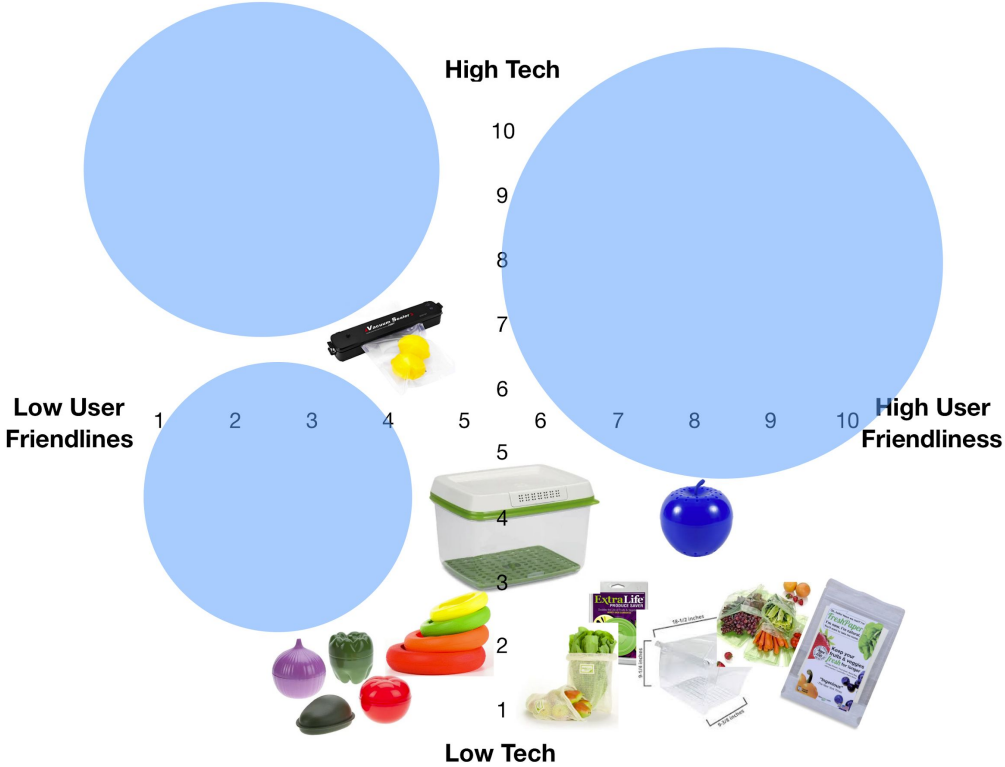
# INTERVIEW OBSERVATIONS

Consumers often seem bound by financial circumstances as well as however much room they can afford to use storing such produce. We found that produce is almost always being wasted to some degree. One interviewee even mentioned they waste "at least a half or a fourth of what I buy". Many of our observations centered around how a user stores their produce, to which was often compromised by not having enough space to store it all properly in the refrigerator, but many users didn't seem to mention storage issues outside of the fridge.

How much produce would you say is wasted per week?
⇒ If it's a bad week more than I should, but if it's not a bad week I would say uhhhh only a bit

If there is produce waste, do you consider it to be negative? why?
⇒ Well yeah, it wastes money and we don't have compost here

How much produce do you / does your household consume per week?
⇒ I'll eat like, well I eat generally half of what I buy and half goes to waste

If there is produce waste, do you consider it to be negative? Why?
⇒ Yes, definitely negative. Because I am wasting my money, and wasting food.
⇒ Yes, it is. Because I will notice that I am wasting food and money.

How do you typically store your produce?
⇒ I usually just throw everything in the fridge, and I have bowls and whatnot on my counters for fruits and whatnot else.

# THE SOLUTION

Our design concept is targeted towards consumers who are subject to wasting produce they were unable to consume before it spoiled. When consumers have to throw out rotten produce, not only do they waste money and resources, but such waste costs us even more to again replenish our refrigerators. If a consumer is to remain conscious of properly caring for their produce at home, one could benefit economically and practice a routine healthy lifestyle -- all while remaining mindful of the environment. Ideally, this product is something that could potentially be used in any household to encourage all demographics to practice healthy lifestyles by storing their produce properly. We would hope to have a design like this available in such home goods stores, home improvement stores, kitchen specialty stores, and/or any online retail opportunities for even greater market access.

# DESIGN OBEJECTIVES & COD's

List of Design Objectives:
Cost-effective, Functional(Operational), Sustainability, Safety, Usability, Accessibility,Aesthetic,Technology, Efficiency

Constraints (must / must not):
Cost-effective: The product must save money for buyers, must not waste more money for buyers.
Functional(Operational): The product must be understandable for buyers.
Sustainability: The material of product must be harmless to the earth.
Safety: The product must be safe to all users.

Objectives (should / should not):
Usability:The product should be easy use for users, but not hard understanding and complicated operation.
Accessibility: The product should be easy access to users.
Aesthetic: The product should has good appearance.
Efficiency: The product should save time for users.
Technology: The product should use the right technology.

Directives (ought to / ought not):
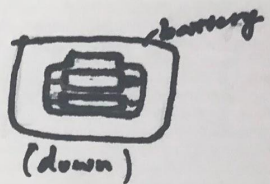Cost- effective: The cost of the product ought to below 25 dollars according to the survey.
Functional: The product ought to be usesable and save space.
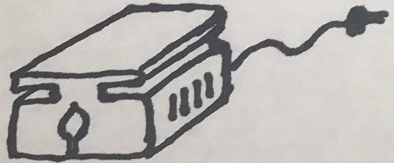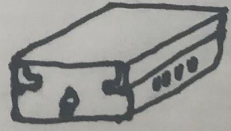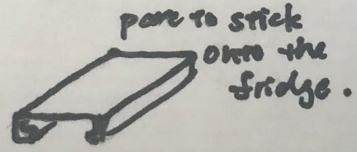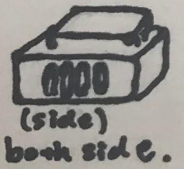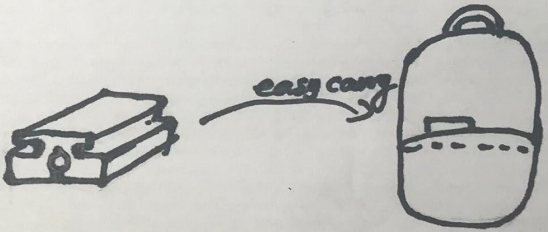Sustainability:The product ought to provide environmental, social and economic benefits
Accessibility: The design of the product ought to put at a place that easy to access.
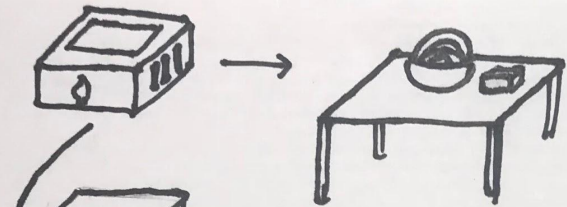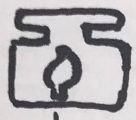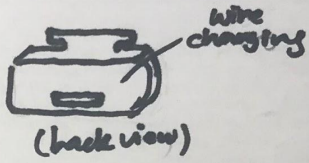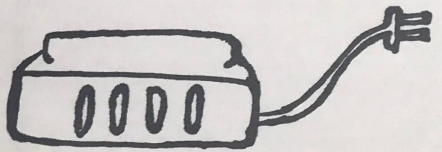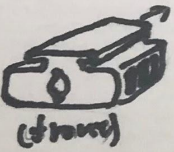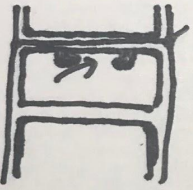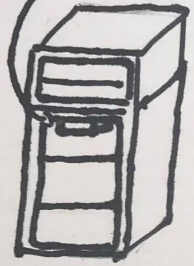
EARLY DESIGN CONCEPTS

# **MOOD BOARD**: lifestyle | green | urban

# AIMED TARGET MARKET

Our design concept is targeted towards consumers who are subject to wasting produce they were unable to consume before it spoiled. When consumers have to throw out rotten produce, not only do they waste money and resources, but such waste costs us even more to again replenish our refrigerators. If a consumer is to remain conscious of properly caring for their produce at home, one could benefit economically and practice a routine healthy lifestyle -- all while remaining mindful of the environment. Ideally, this product is something that could potentially be used in any household to encourage all demographics to practice healthy lifestyles by storing their produce properly. We would hope to have a design like this available in such home goods stores, home improvement stores, kitchen specialty stores, and/or any online retail opportunities for even greater market access.

The ideal user experience should be both educational and efficient. Not only should this product help educate users on how to properly store produce, but should also encourage users to make routine of taking care of such goods on a regular basis. The product's function will ultimately be user-friendly and organizational, durable, aesthetically conscious, and cost effective. A user should be left feeling healthy and smart about their lifestyle choices.
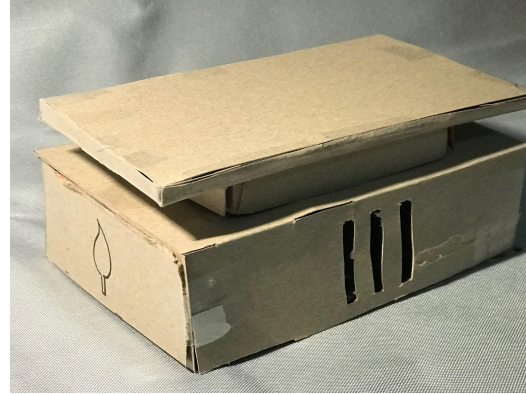
# FINAL THREE CONCEPTS
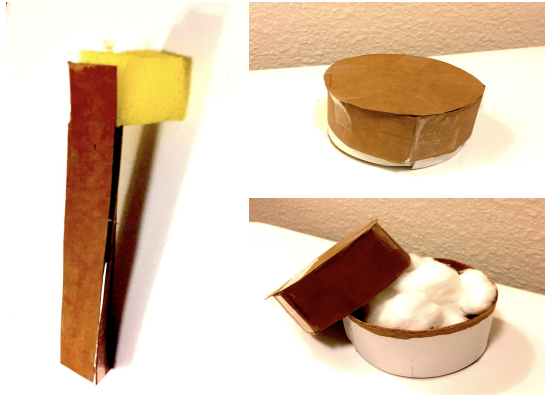


## Food Wax

⇒ The soft wax should be presented in a small, container with a four inch diameter with a soft brush for both application and removal.

⇒The wax has similar properties as coconut oil: in cold temperatures, the wax is solid, but when warm or when heated by body heat through touch, the wax is liquid.



## Food Purifier

⇒ Purifier and ionizer which can be put both into a refrigerator and outside. It is able to extend the life of produce. It also can make the air fresher.Ionization can quickly and consistently destroy bacteria and contamination in a fridge and food storage. It can charge by charger or batteries.



## Reusable Filter Bags

⇒ A group of mesh produce bags that the user would take shopping with them that have built in ethylene filters to keep their food fresh. The bags who no old keep food around longer but would also help reduce plastic waste from the use of store plastic produce bags as well as require little change to the uses grocery routine.

# DESIGN INSPIRATION

GreenTech Environmental Extend Food Life Air Purifier and Ionizer for Refrigerators

Price: $49.99

by GreenTech Environmental

*4.9 out of 5 stars*

18 customer reviews

Amazon's Choice for "food purifier"

How do we improve on a product that already exists in an heavily saturated market?

# PIVOTAL DESIGN MOMENTS





One of the pivotal design moments during our process was during the concept refinement phase after choosing which early concept to expand upon. We noticed the removable component of a macbook charger could function on our product. We decided to use that inspiration to integrate a "to-go" piece into the purifier which would separate our product from others like it on the market. The "to-go" section would charge simultaneously with its parent component similarly to how a Nintendo Switch charges its controllers when in its docking system, and provided freshness on those long days.

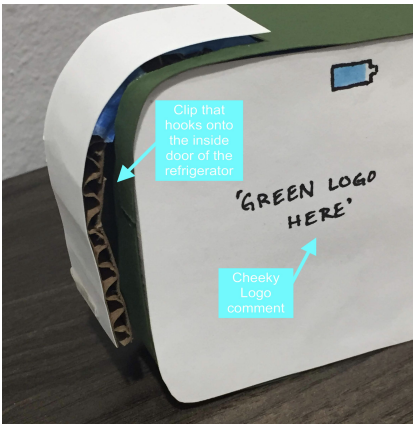# AESTHETIC INSPIRATION
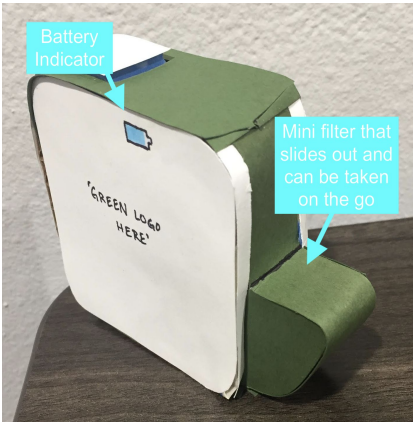
Colors and shapes:
⇒ Smooth
⇒ Light
⇒ Handheld
⇒ White
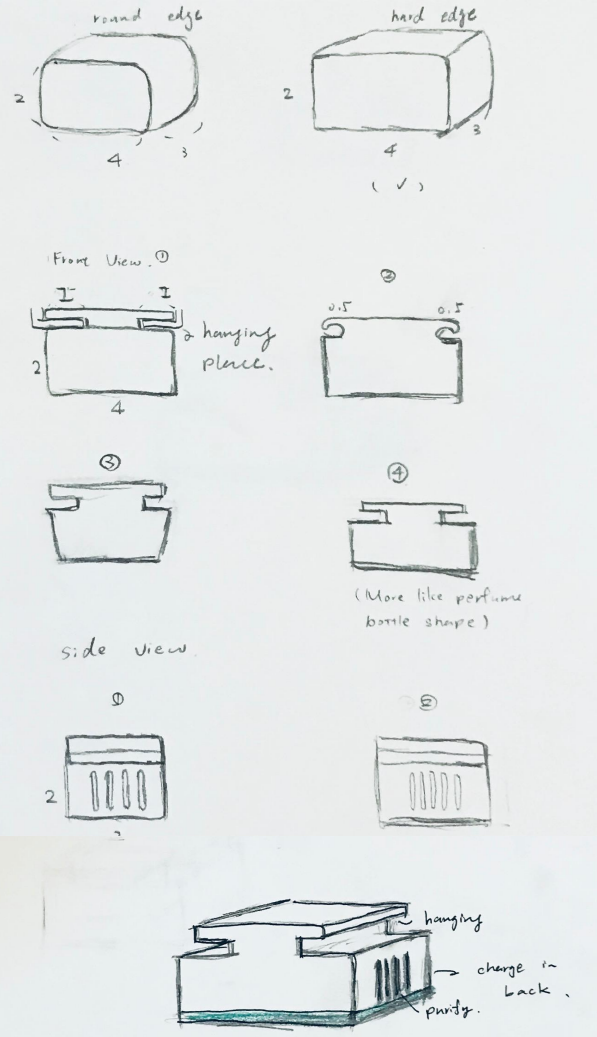
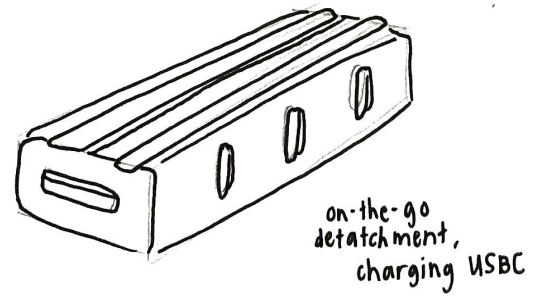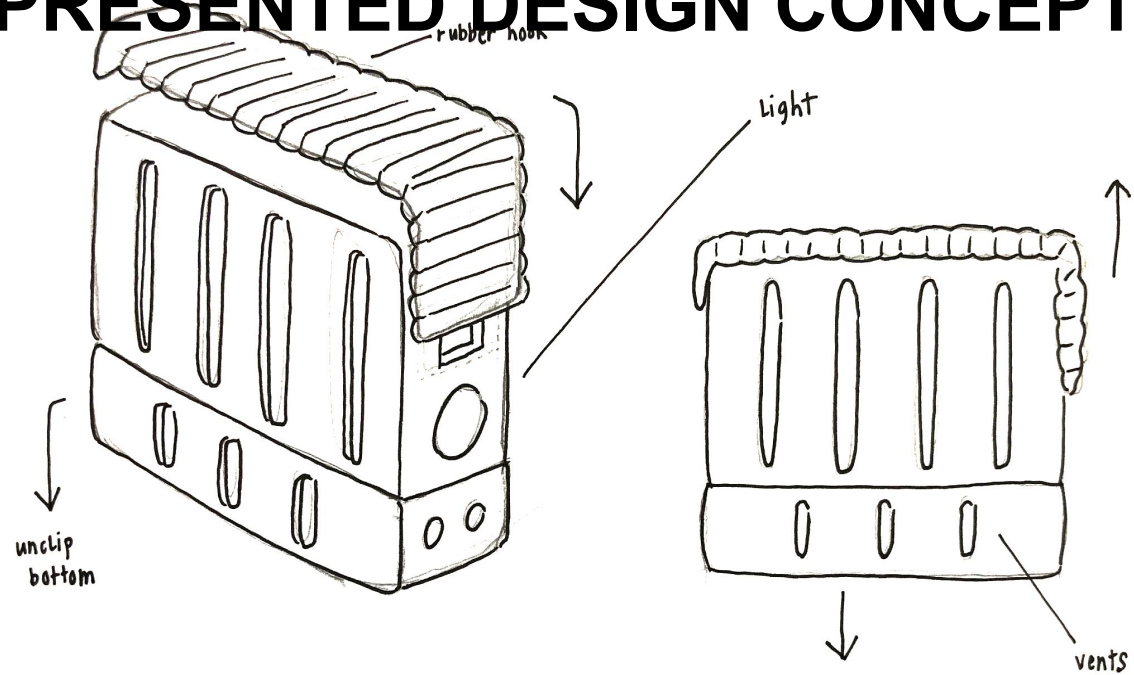# AESTHETIC INSPIRATION

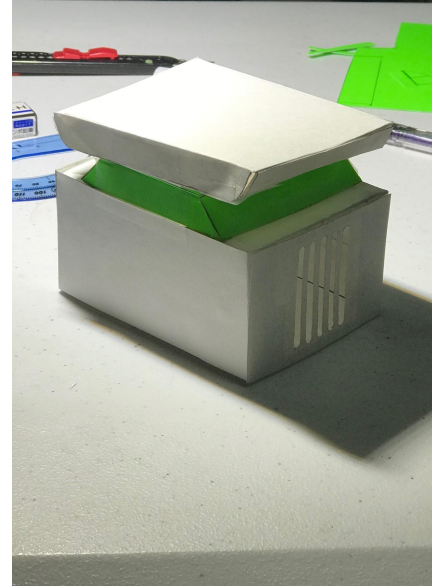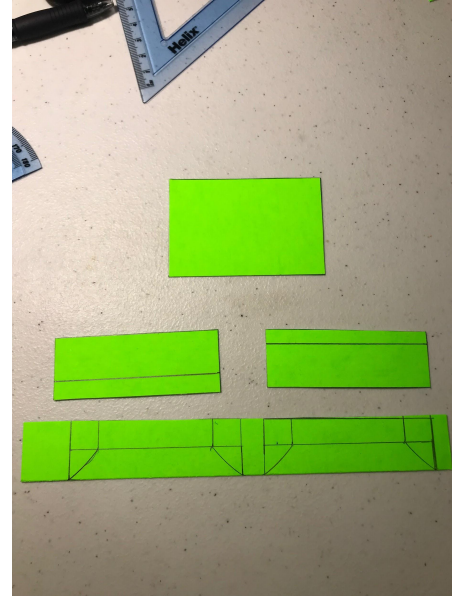Adjectives describing the design:
⇒ Clean, safe
⇒ Simple
⇒ Universal
⇒ Mobile
⇒ Fresh

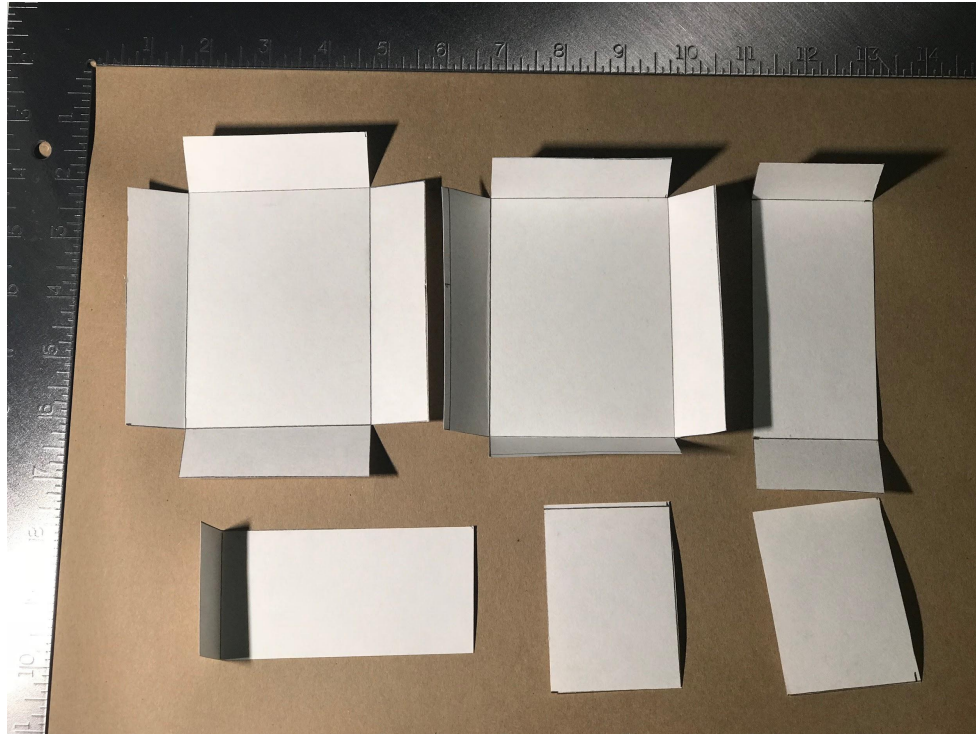# PRESENTED DESIGN CONCEPT

# PRESENTED DESIGN CONCEPT



rubber hook

Light

unclip bottom

vents

on-the-go detatchment, charging USBC

round edge

hard edge

( ✓ )

Front View. ①

③

hanging place.

②

④

(More like perfume bottle shape)

side view
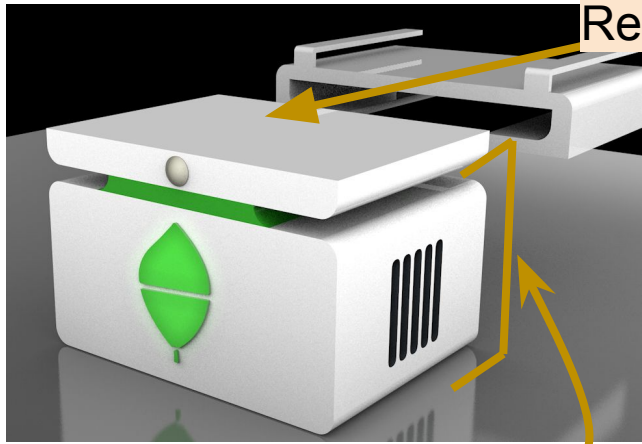
①

②

hanging

charge in back

purity.

# MOCK-UPS PROCESS
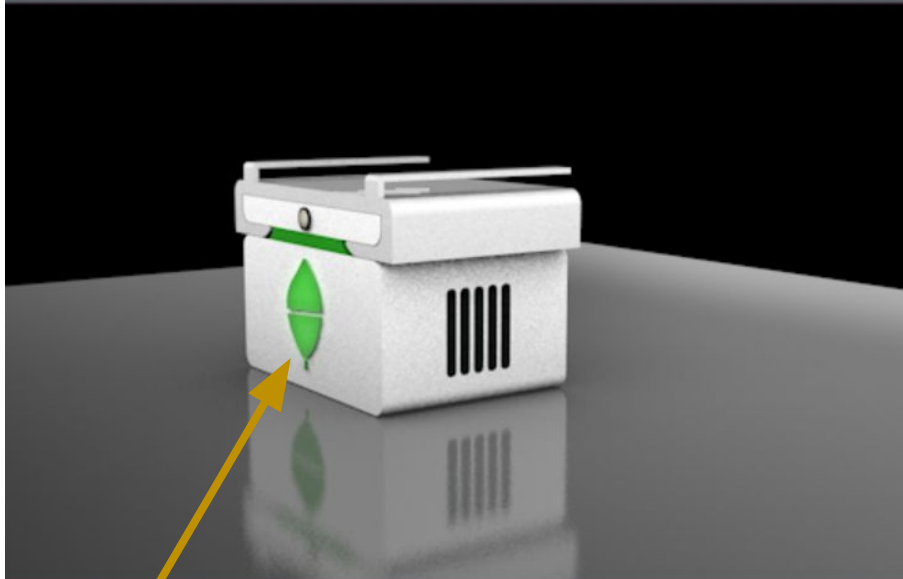
# FINAL MOCK-UP

# RENDERINGS
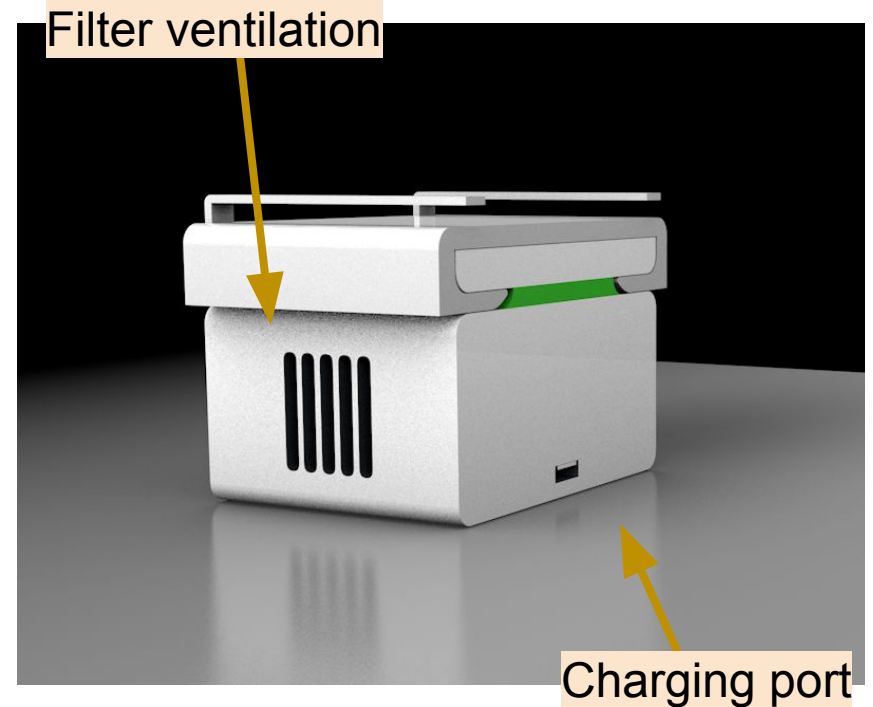


Removable to-go component

Hooks to hang on refrigerator shelf

Compact body

# RENDERINGS



Battery life Indicator

Filter ventilation

Charging port

# PRODUCT TESTING

How do you think about the overall aesthetic by seeing the 3D model and the prototype?

I think it looks nice. It is more detailed in 3d model, cause the angels are not all sharp edges, so it makes the shape looks better. However, the real model can see the size clearly, and I think the top sliding board is a bit too big. If it can be smaller and has same round edges show like the 3d model, then that will be good.

Do you think it is functional?

Yes. I think it is really good to hang it on the fridge layer. It can save space. Also, it can keep staying at the place that I can see, so I will not afraid of forgetting to charge it when the logo is not glowing. And the real model can really work.

What part do you think it can be improved?

Just like I said in the first question, if the sliding board can be smaller, and have round edge, it will look better. Also, the bottom part cannot slide out really well when I use the real model, but that is because of the craft. Otherwise, I think it is good.

Would you buy it if the price is around $40-50?

I will consider how long can it use for. If I can use it for a long time and do not need to replace it, then I will buy it.

# CONCLUSION

freshFridge is a product that strives to work entirely for the consumer. The heavily saturated market for produce saving technologies cannot compete with the effectiveness or the functionality of freshFridge due to a few key components. The chargeable to-go component allows for users to ensure fresh food throughout the day and on the go and optimizes the utility of the product while the slim features and hanging capabilities serve to maximize fridge room. Despite a challenging and rigorous process, our product, freshFridge serves as an intelligent and competitive solution to the problem of domestic food waste globally.