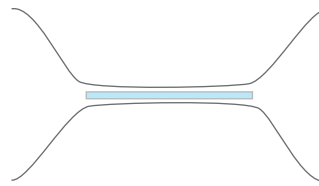


APPLIANCES FOR SUSTAINABLE LIVING
“VERDANT, THE ECO- REFRIGERATOR”

Rochester Institute of Technology
School of Design / MFA Industrial Design
Design Studio. Prof. Alex Lobos. FALL 2014
By Team EYE: Yolegmma Marquez / Erin Glaberson / Emily Kvale



Green life
for today:
Airclean
Алгата
Аэратор



RESEARCH | DESIGN PROPOSAL

October 5, 2014

DESIGN PROPOSAL

In short, we aim to improve the user experience by creating an innovative, timeless and aesthetically pleasing design. Our design encompasses three general areas: features, ergonomics and sustainability.

PROBLEM STATEMENT

How can we encompass features, ergonomics and sustainability to create an innovative, but timeless design?

USER NEEDS TO BE ADDRESSED:

- Spacial Awareness
- Accessibility
- Cooling Efficiency
- Cost / Affordability
- Aesthetics
- Special Attention to Interior and exterior
- Practicality
- Sustainability
- Attractive Features

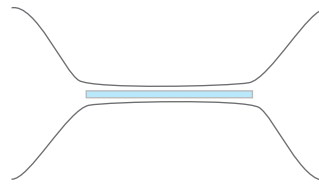
SUSTAINABLE NEEDS TO BE ADDRESSED:

- Reduce energy consumption
- Opening refrigerator less
- Possibly generate power through manual energy
- Use metal interior without increasing the cost of the product
- Precautions with power outages; making it so the food doesn't spoil
- Changing the user behavior
- Reducing food waste

RESEARCH | REFRIGERATION

HUMAN FACTORS & FEATURES

October 5, 2014



OVERVIEW

Our group has spent the past few weeks researching our two topics for our Refrigeration project: Human Factors and Features. This includes benchmarking, reading reviews online, observing the product in stores as well as talking to salesmen about said products. The information we found is compiled into this one-page summary.

Upon researching, we have found various parallels between different brands and options that are on the market today. Based on this research, we have below multiple features that we believe should be looked at or noted when diving further into this project.

KEY TAKEAWAYS

FEATURES

Easy-to-clean features such as spill lips to catch spills, or easy to remove shelving are trending.

Some newer features that attempt innovation are bluetooth music speakers that are embedded into fridges and a carbonated water/soda maker feature on the built-in drink dispenser.

The older generation (especially women) prefer simplistic features that are less hi-tech and “new.” This market prefers the classic two doors (Top Freezer Refrigerators). They also prefer a clear distribution of space in the interior of the refrigerator, which gives them more freedom to organize products.

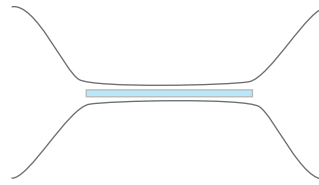
One of the most novel and interesting features that we found is the dividing system of the frozen area in the most advanced models. They are metal rods that move in two directions in a simple and efficient way to allow users to adapt the spaces to the size of the products that they want, while also being allowed to change the way the space is organized at any time.

According to expert salesmen (from both Home Depot and Sears), in general, men seem to be more open minded to trying newer designs and innovations, or even alternative fridge layouts, such as refrigerators with a separate refrigerator drawer (a 4 to 5 door refrigerator). One example of the benefit of this type of fridge is that they allow parents to put snacks for their children in their own drawer, and children can then take their own snacks from the drawer, thus not have to go searching through the large refrigerator and disorganizing it for what they want.

RESEARCH | REFRIGERATION

HUMAN FACTORS & FEATURES

October 5, 2014

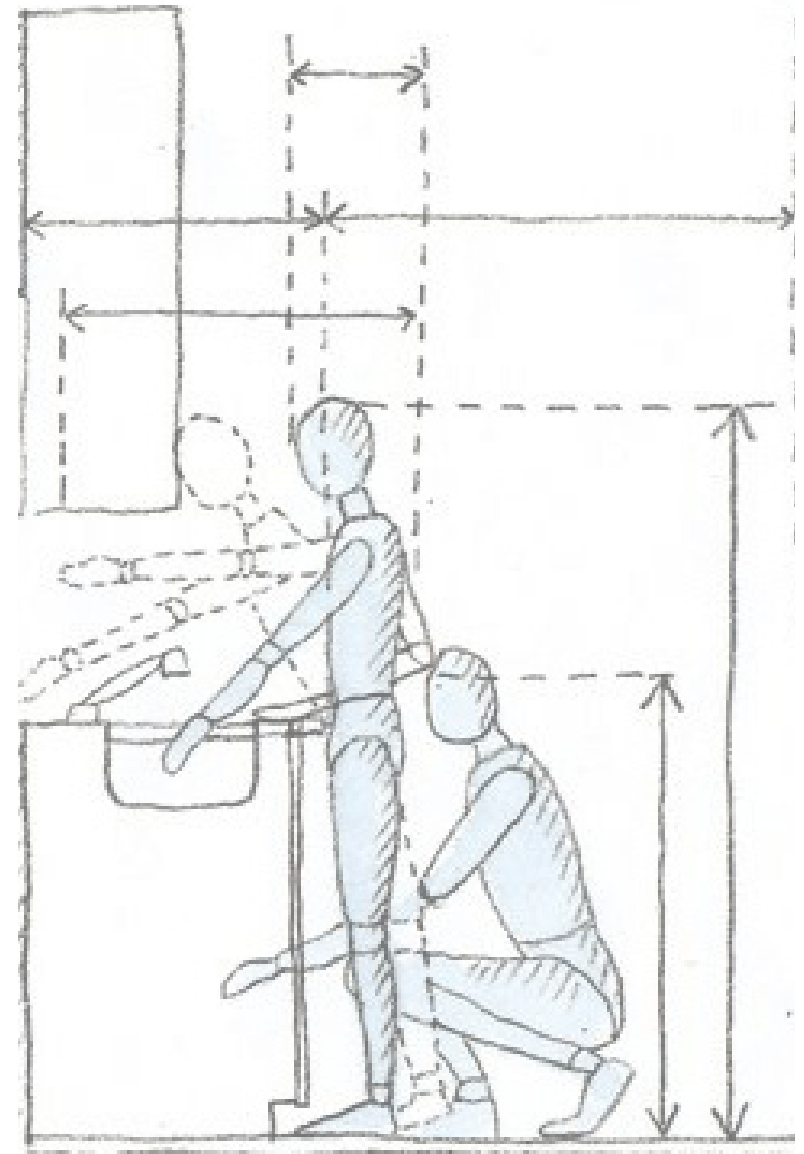


HUMAN FACTORS

In our research we discovered that the prime shelving height should be between the waist and shoulders of a person.

One of the best examples of attention to ergonomics that we found was the single long flexible handle located on the freezer of french-door type fridges (at the bottom), which reduces the amount of muscles the user has to use to open the door.

We also found that today, user interfaces are simpler, more clear and more efficient. Regardless of how expensive the product is, the use of icons and classified information is always present in most of models. For example, in stores for advertizing and aiming to grab the attention of the potential buyer, there are high-end models that have a displays located outside on the fridge door, or inside the cooling area. This helps causes the user have access to the most highlighted information about the fridge automatically.



RESEARCH | REFRIGERATION

HUMAN FACTORS & FEATURES

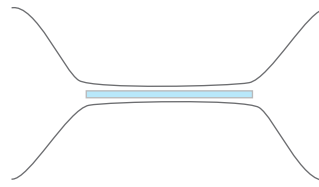
October 5, 2014

PERSONA

Our user is a male parent from California that take over the activities previously carried out by women who seeks an ally in household chores, especially a refrigerator.

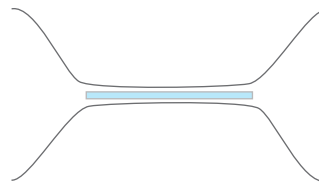
He desires a refrigerator that is aesthetically simplistic, beautiful and modern, enabling it to organize easily and help him efficiently provide meals for his family all week, but also can provide independent interaction for other household members if they so wish (including children).

Additionally, this dad needs a refrigerator that guarantees energy savings, because the cost associated with this greatly affects the household economy. On the other hand, he also wants to have a refrigerator that is versatile and attractive for guests in the house. For example, some features he may prefer are an ice dispenser with different functions that is easy to operate and works efficiently and safely. Likewise, there should be easy access to different compartments in the interior.



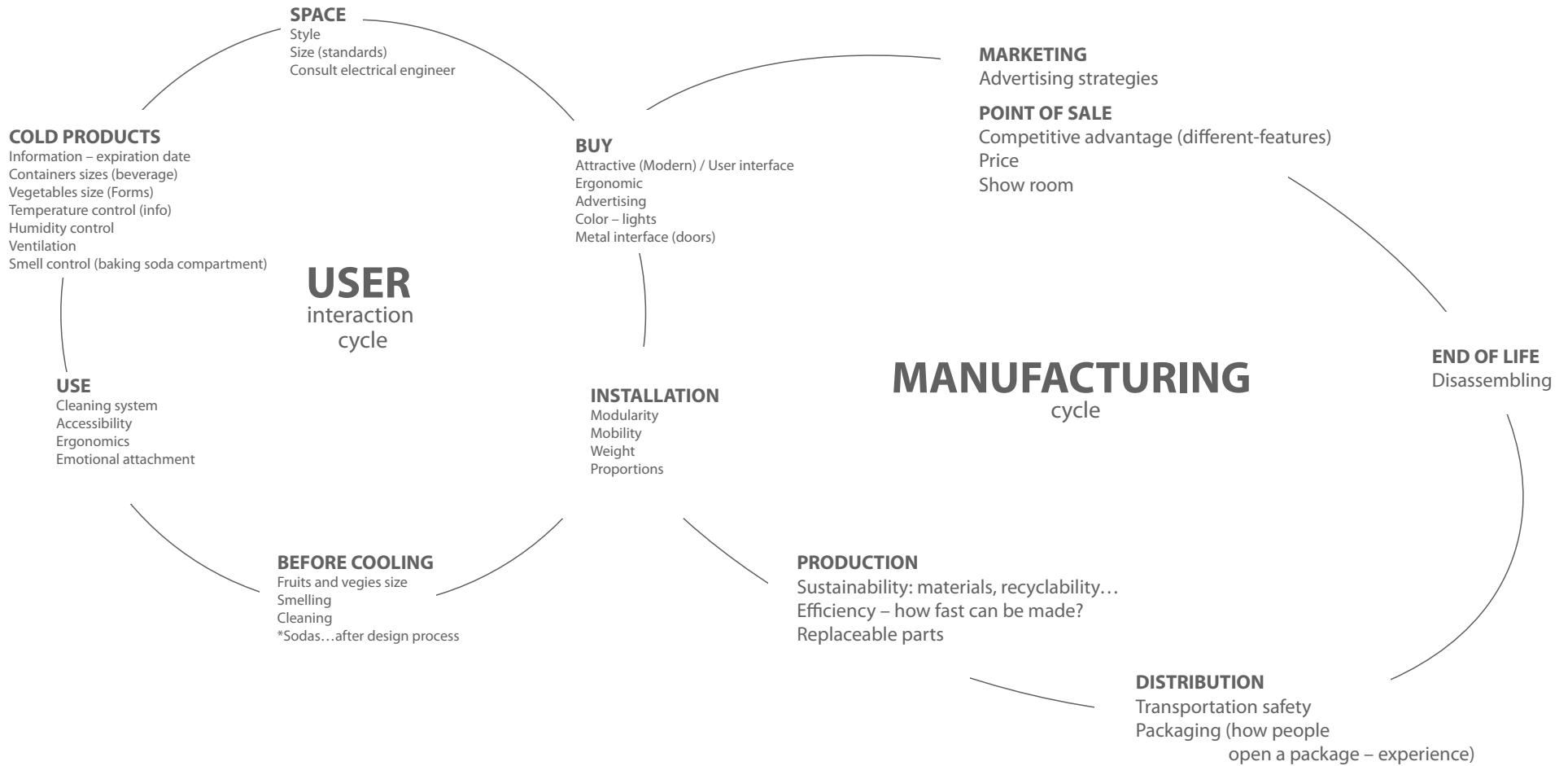
EXTRA INFORMATION

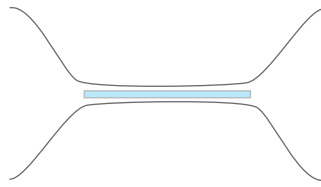
According to experts, buying a refrigerator is performed in two steps. First, the user visits stores, looking for the options that better meet the customer needs. Step two, the seller usually sends consumers back home to measure the space where the product will be installed. The salesman usually asks the client about the type of users (family vs. independent individual), the frequency of use, and the spaces around the product in the kitchen. Then, they help make the best decision based off of that information.



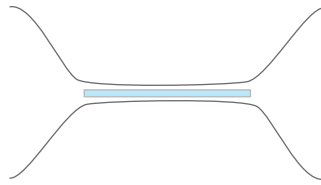
LIFECYCLE MAP

October 5, 2014



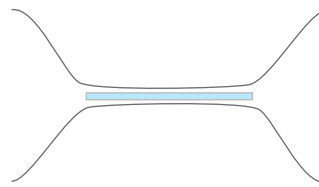


DESIGN PROCESS



DESIGN STATEMENT

By promoting environmental sensitivity, we aim to design an innovative refrigerator that creates sustainable behaviors, reduces both waste and energy consumption, while also provides the user with a positive experience.



USER PERSONA

MARK MALLON

42 Years Old

Married Father of one 8 year old

Loves to cook Lives in California

Yearly income of \$175,000

Wife also works Comes home from work at 6pm
and cooks dinner

Enjoys “High Design” products Environmentally
conscience.



MIRIAM SMITH

From: Oakdale, CA

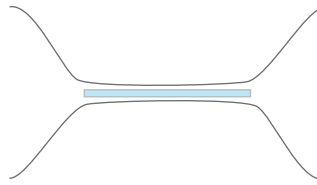
Occupation: Graphic Designer

Has 2 children; ages 15 and 17 Age: 45 years old

Other: Is environmentally conscience

Husband works at Pepsico packaging for material
science Combined income: \$130,000/yr.



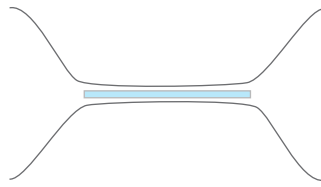


KEY USER NEEDS

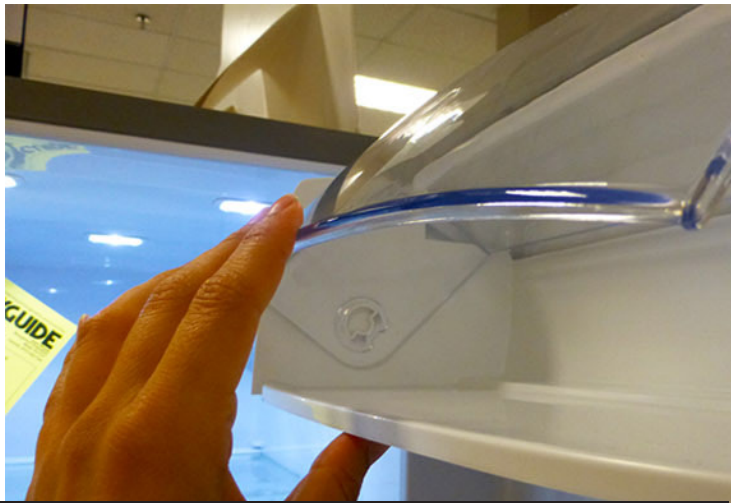
- . Increase storage space
- . Providing new experience across the senses
- . Reduce expense related with food consumption

KEY SUSTAINABILITY GOALS

- . Reduce energy consumption
- . Reduce food waste
- . Reduce water consumption
- . Create healthier lifestyles through ecosystem



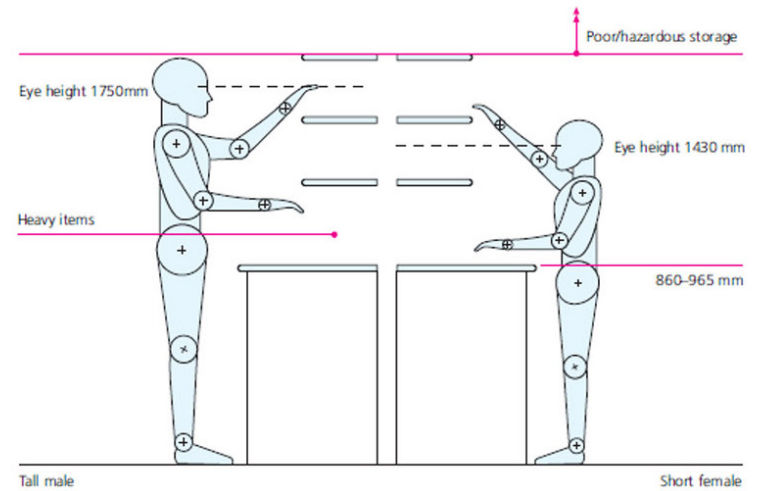
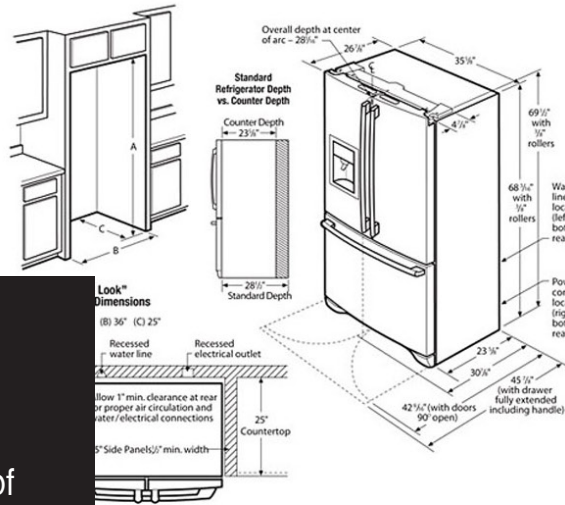
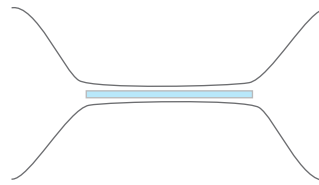
CONTEXT RESEARCH



Analyzing ergonomics
in competitors.

Understanding the tastes of users in the
space of purchase.

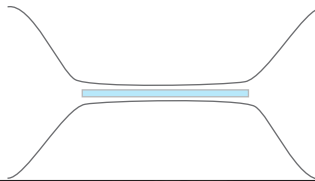




Analyzing ergonomics in competitors.

Understanding the tastes of users in the space of purchase.

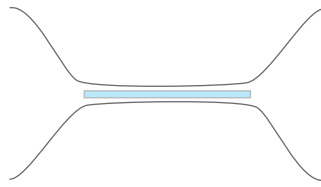




Understanding the tastes of users in the space of purchase.

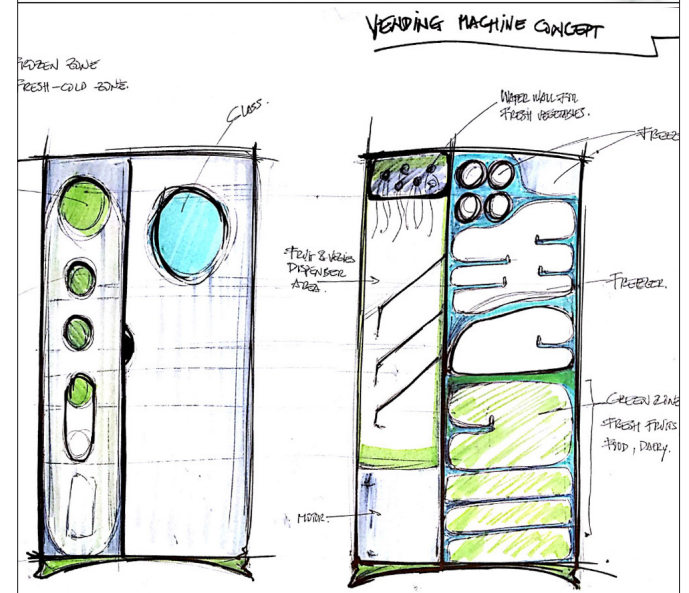
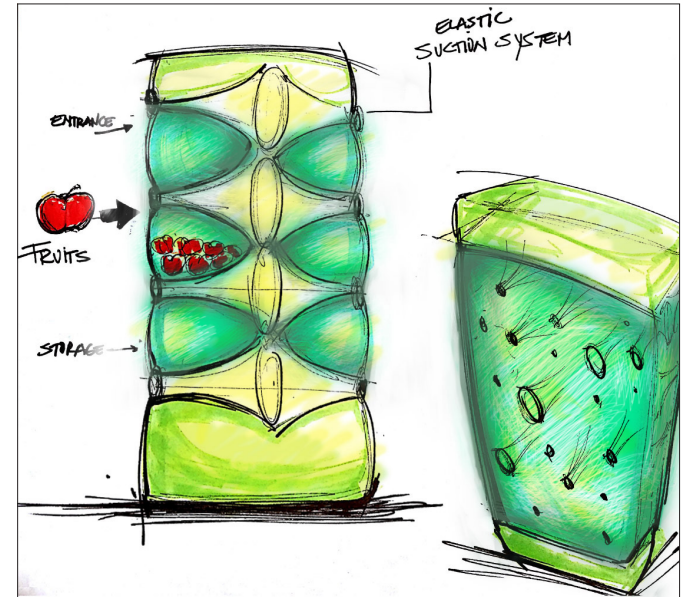
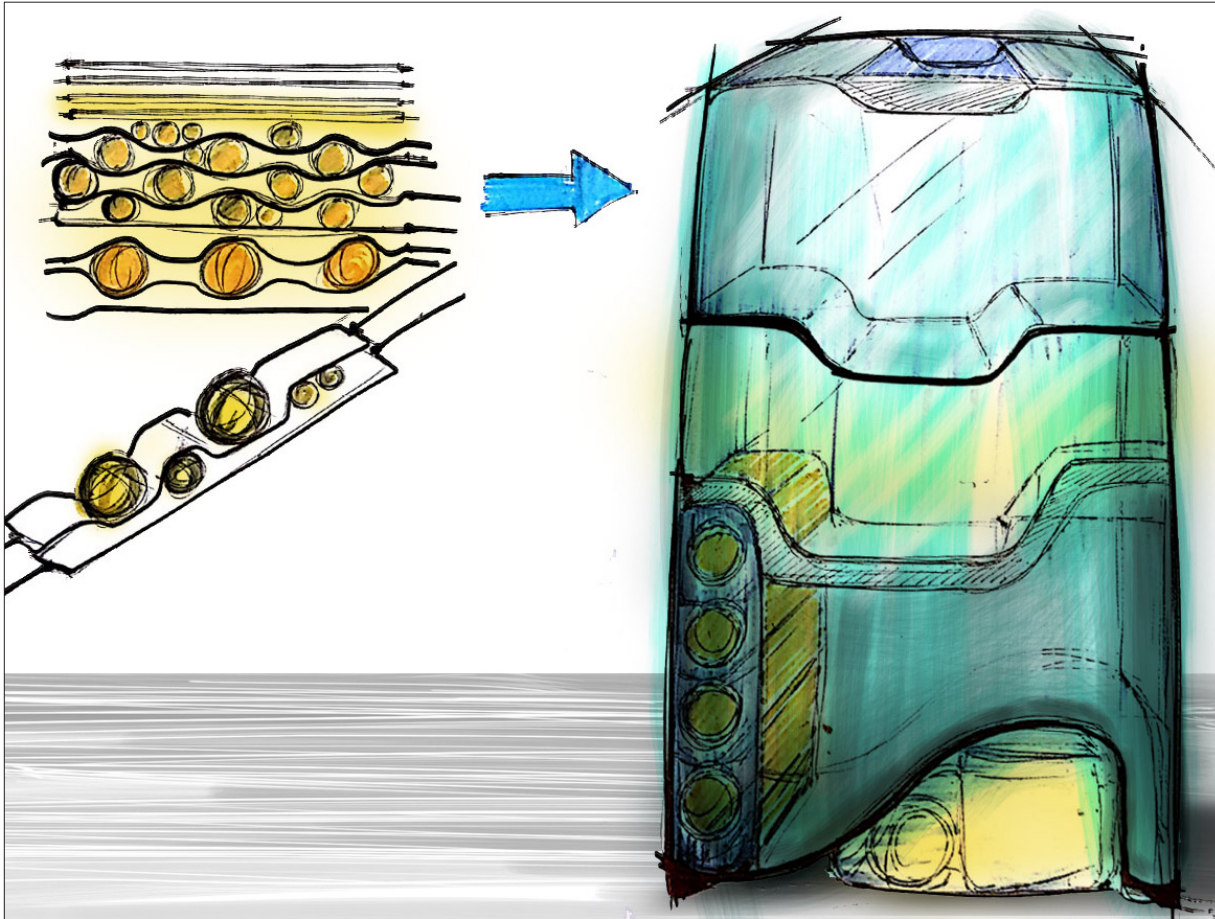
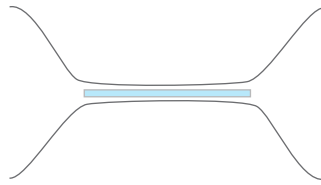
Analyzing the packaging of food and the way these are classified at the point of sale.

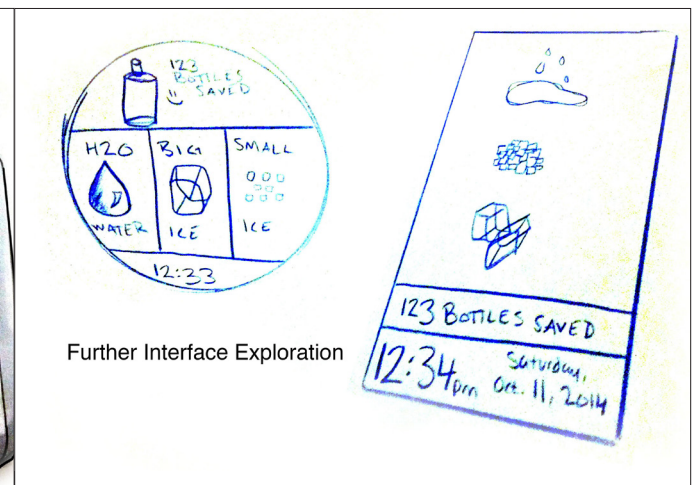
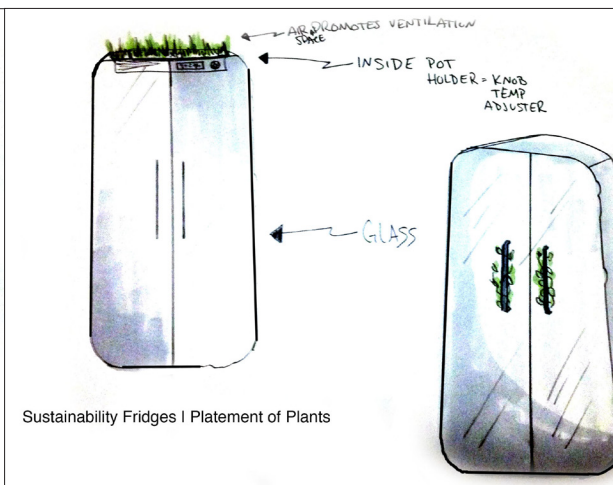
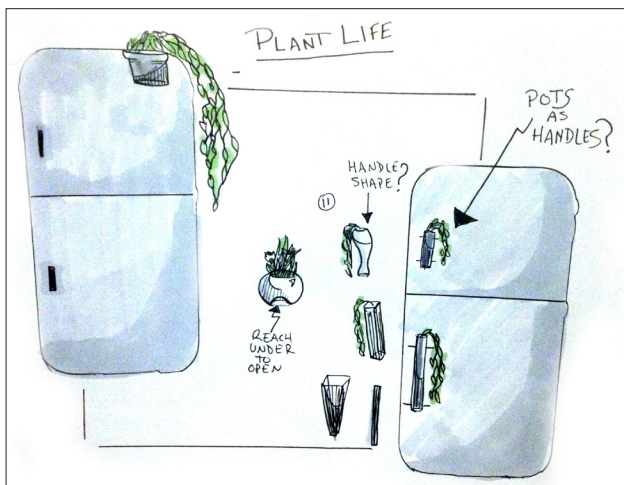
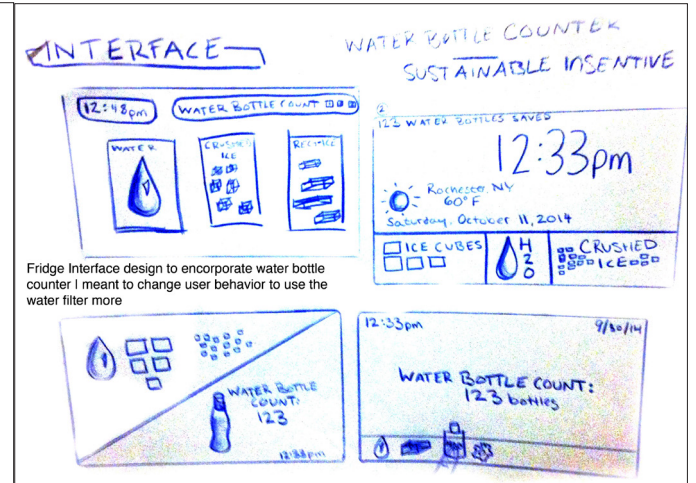
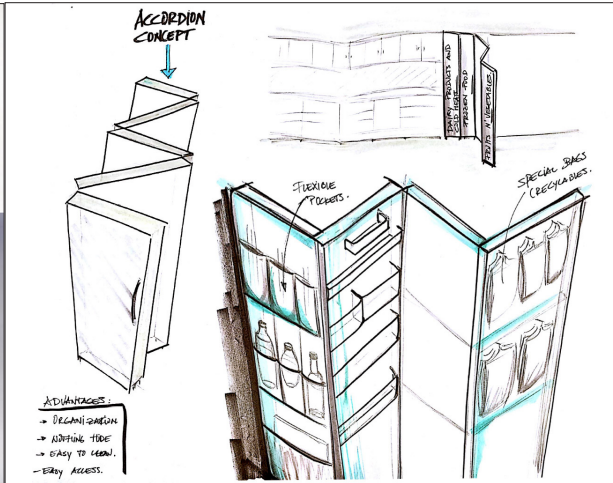
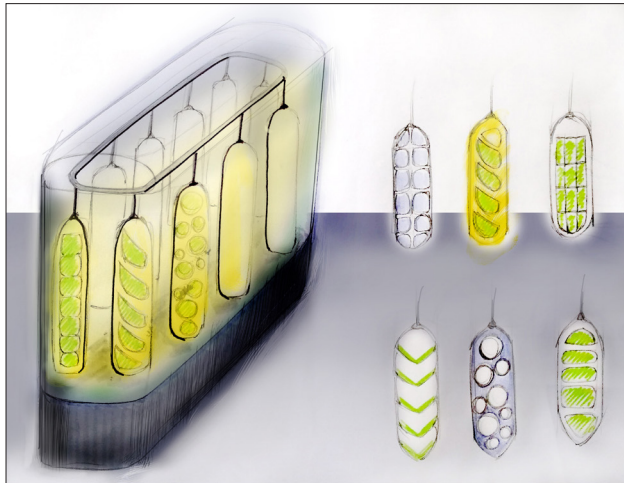
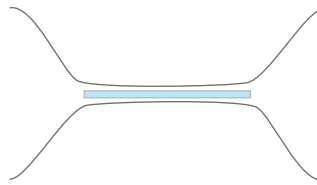
Supermarkets visited: Wegmans, Walmart and Target.

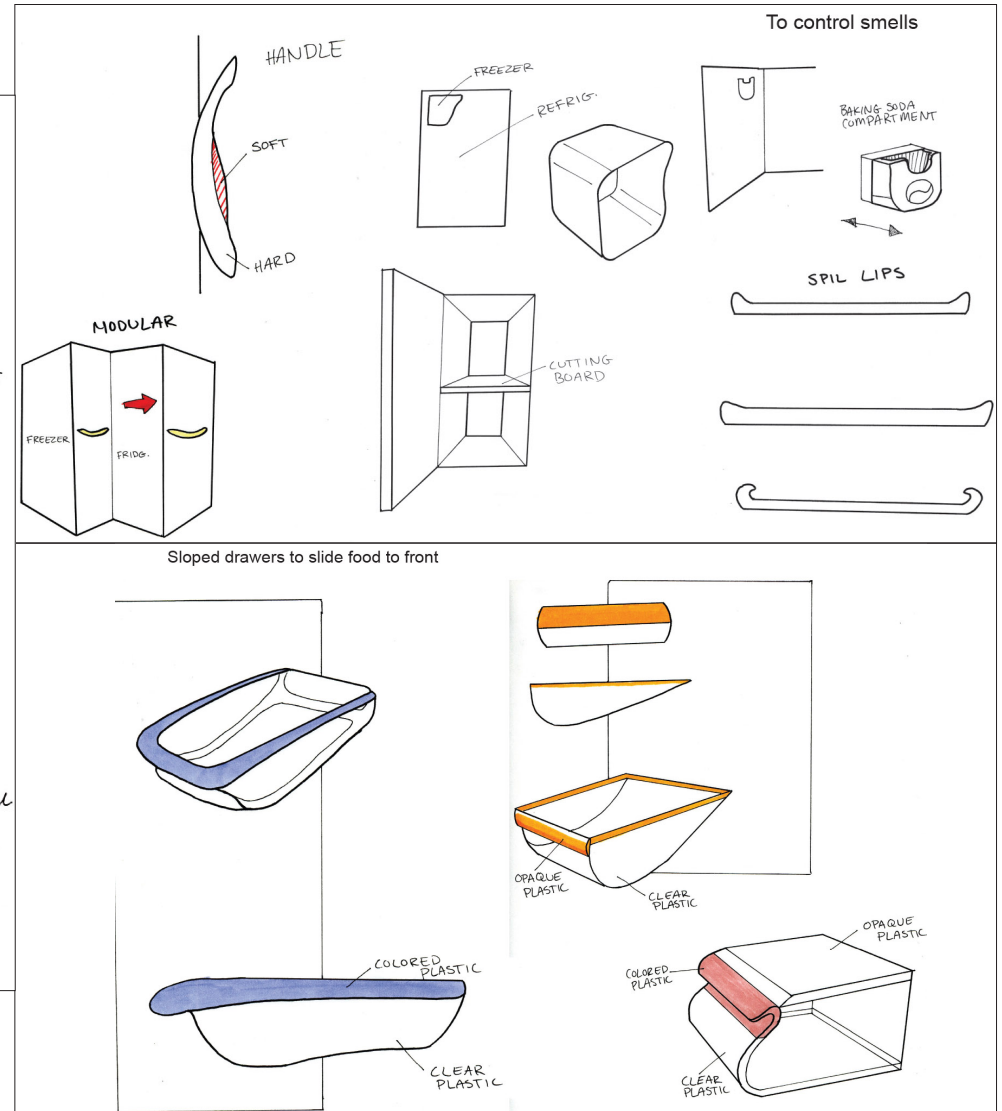
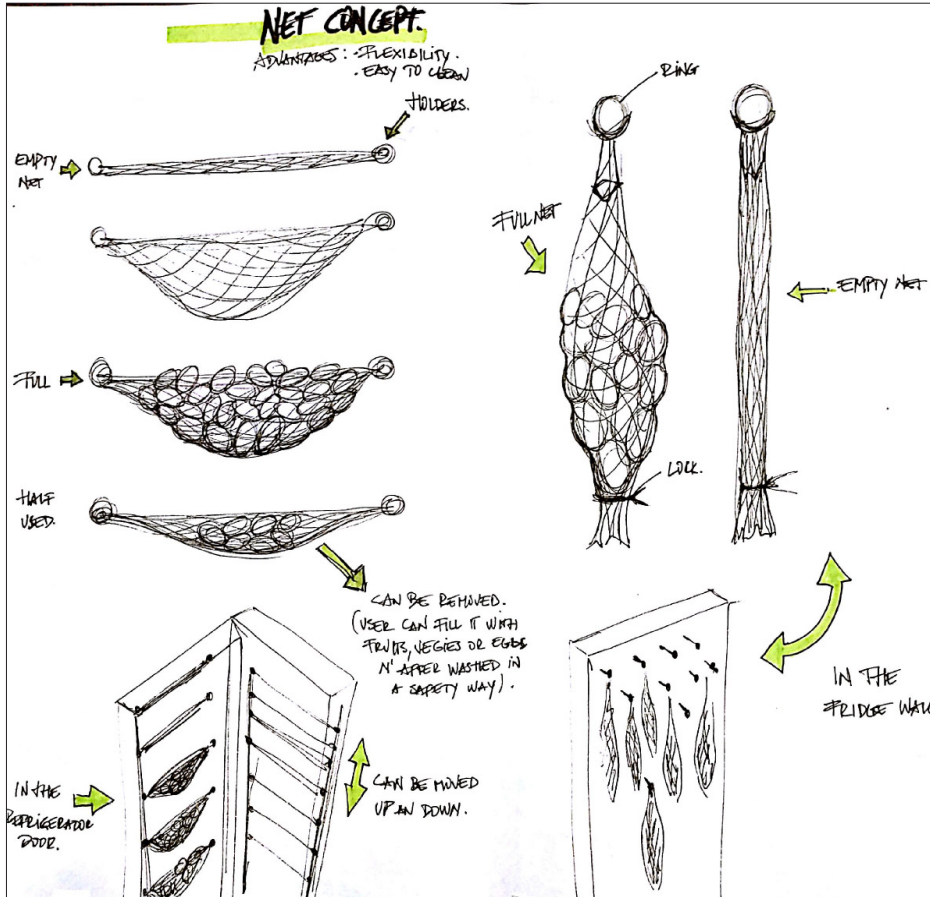
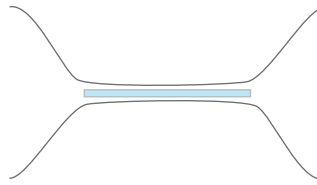


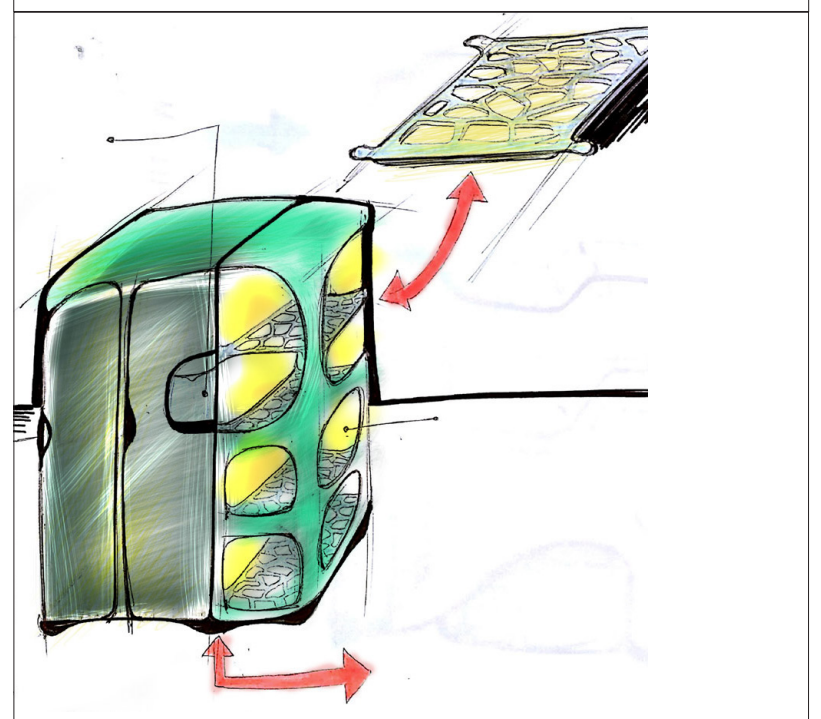
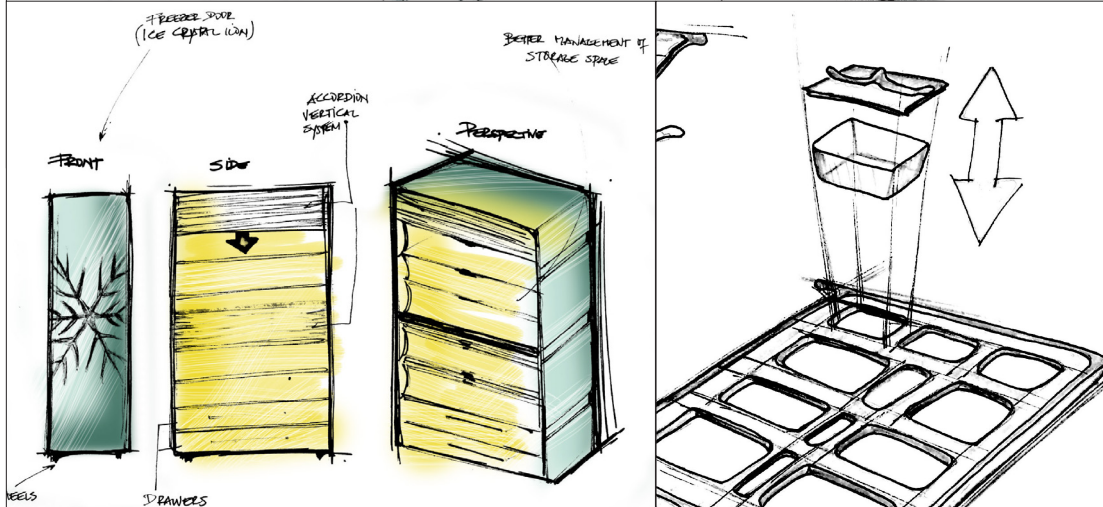
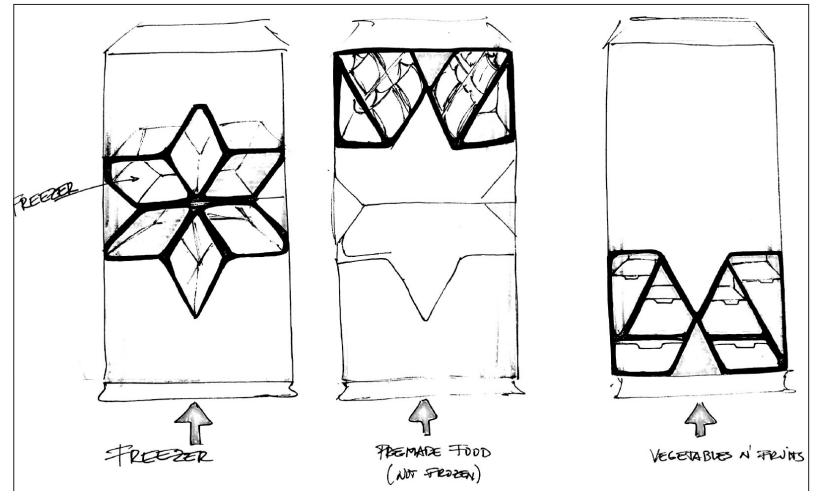
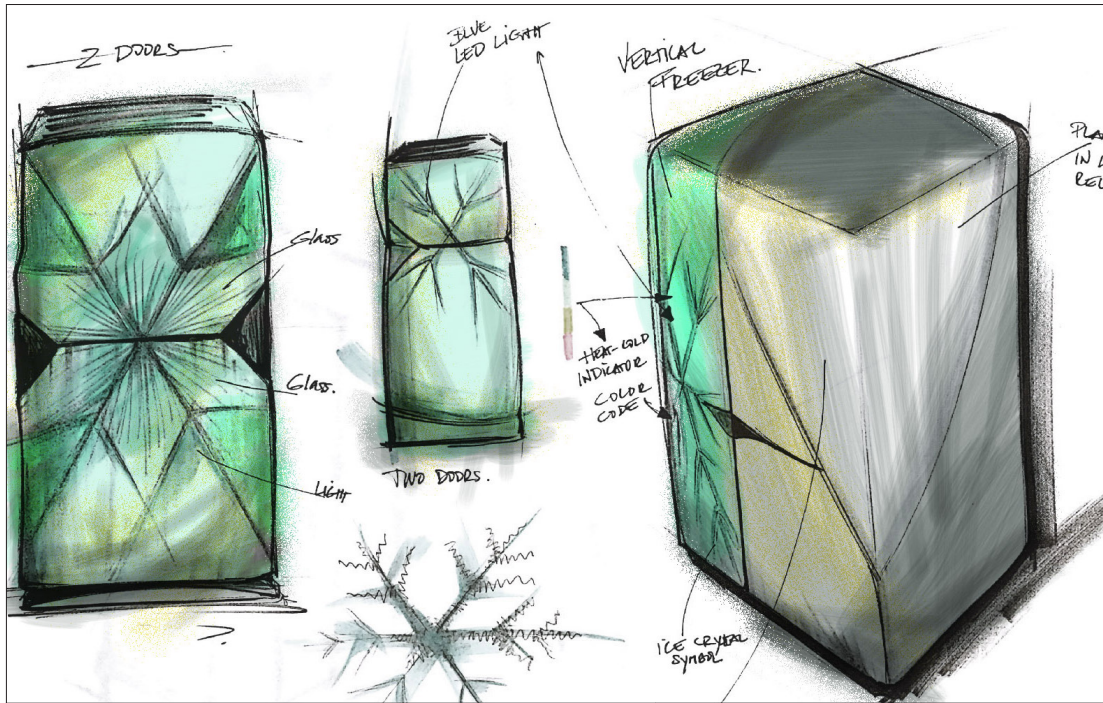
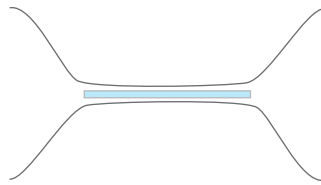
BRAINSTORMING

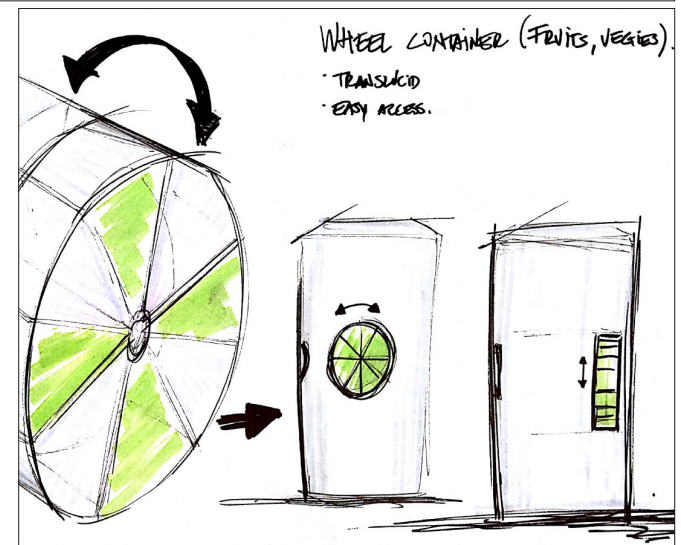
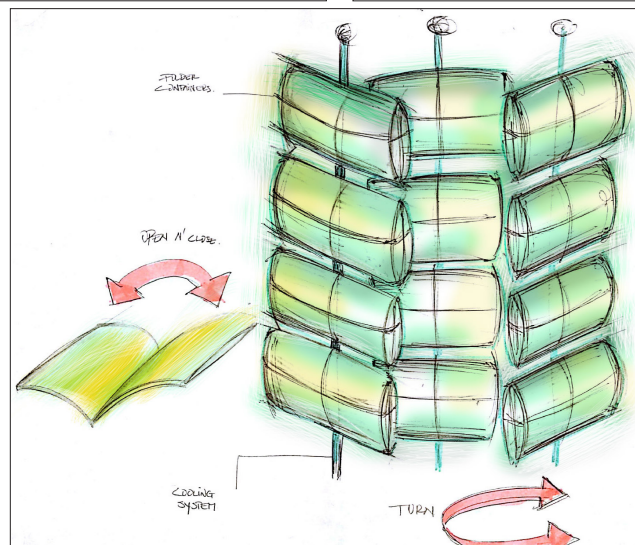
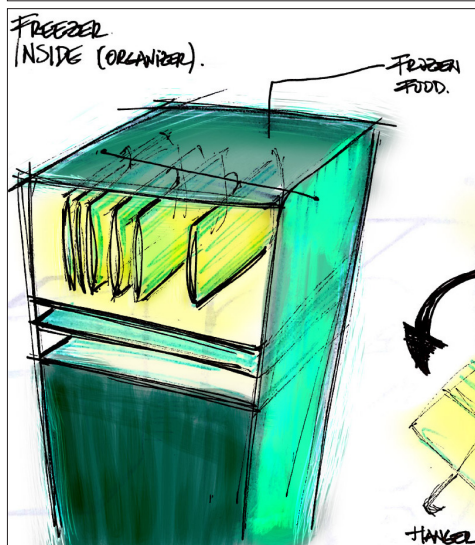
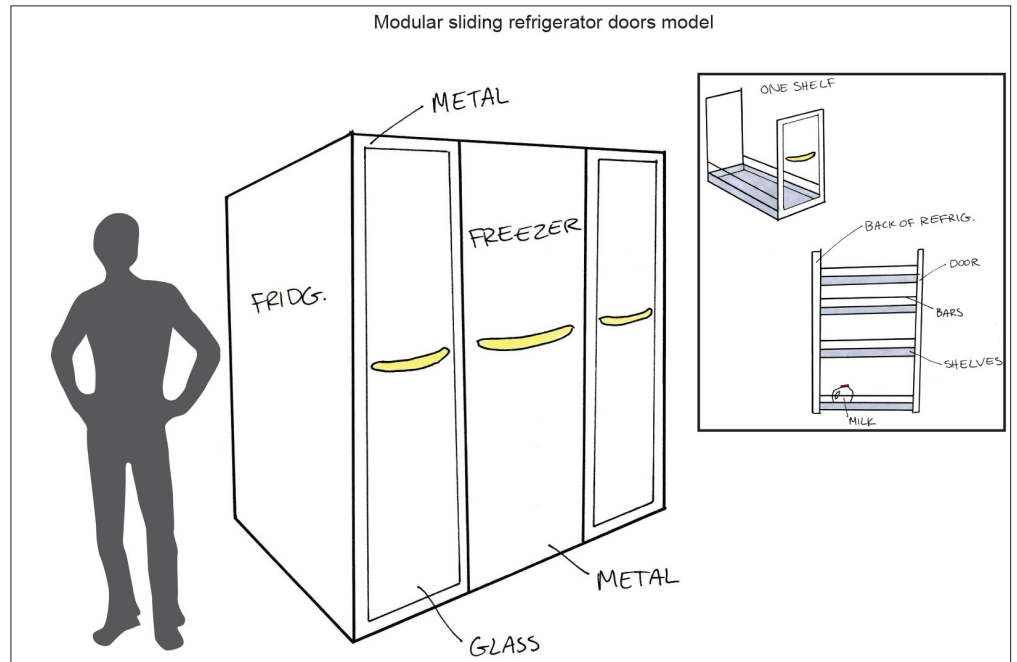
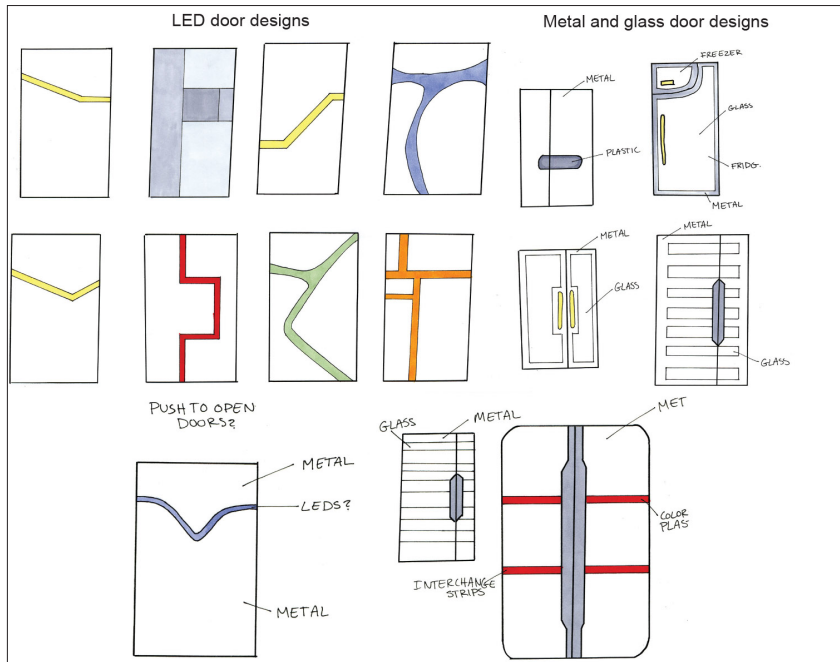
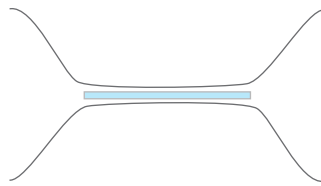
BRAINSTORMING

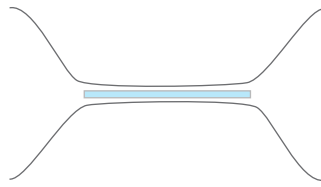








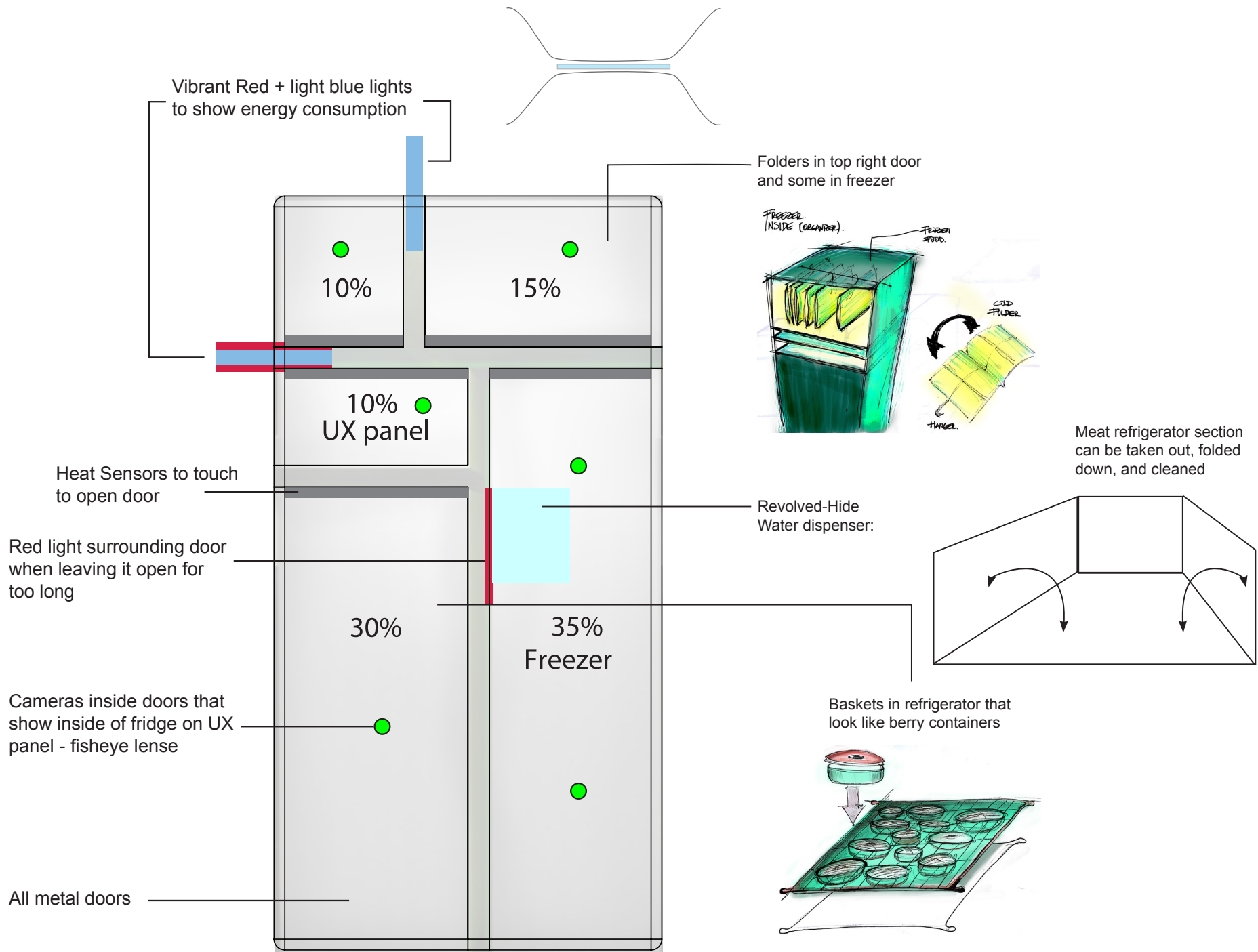




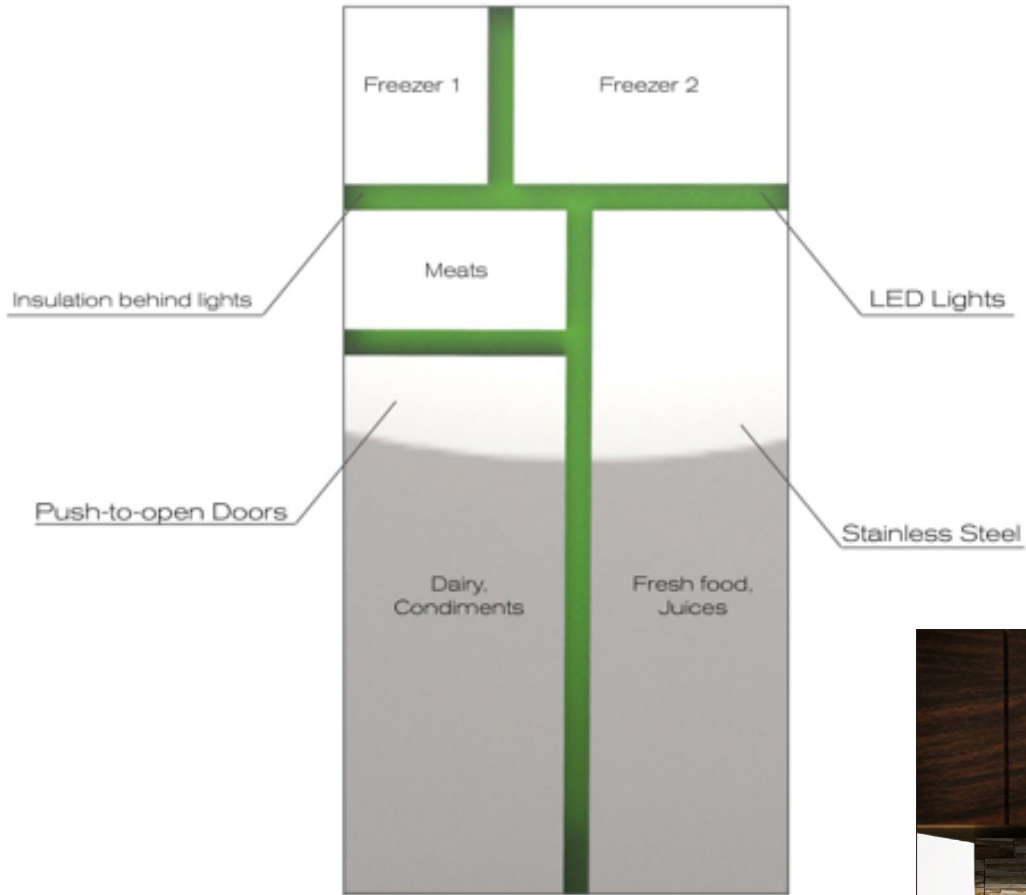
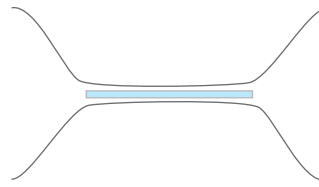
3D PROCESS

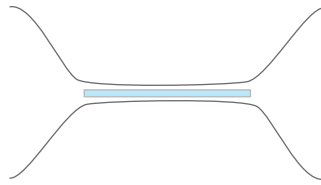
digital

3 concepts selected



CONCEPT 1





CONCEPT 2:

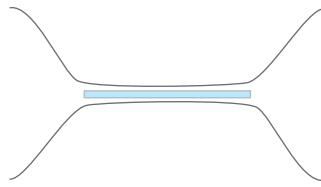
Azalea plants

Generator

Indoor light

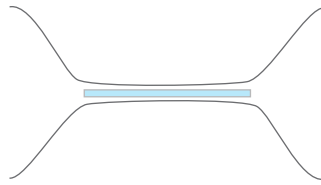
Create healthier lifestyles through ecosystem





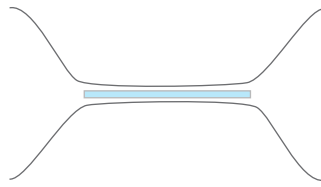
CONCEPT 3: Separate compartments, visibility, elegance, power consumption efficiency, recyclability of materials.





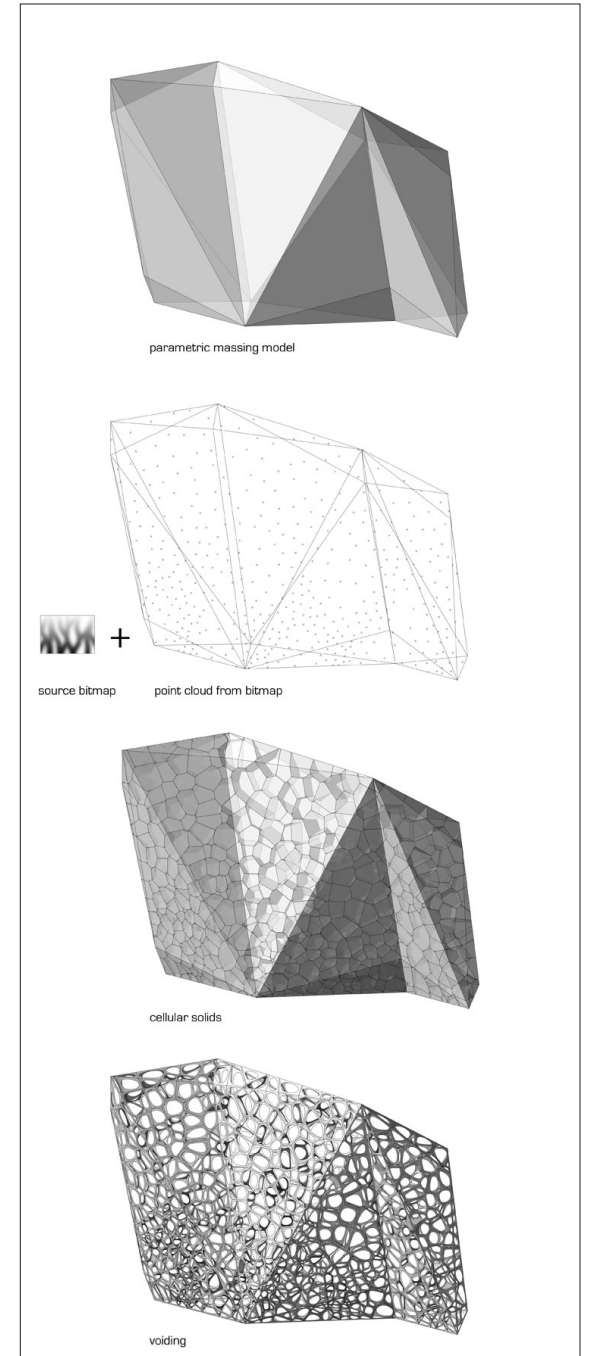
EVOLUTION OF
FINAL CONCEPT

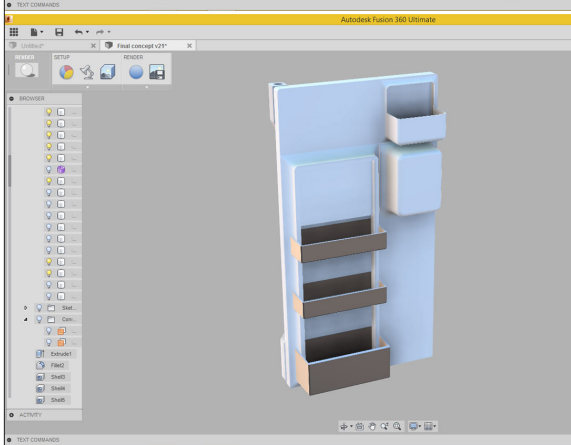
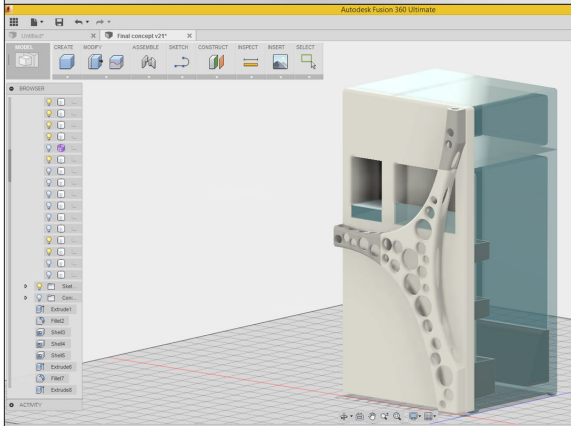
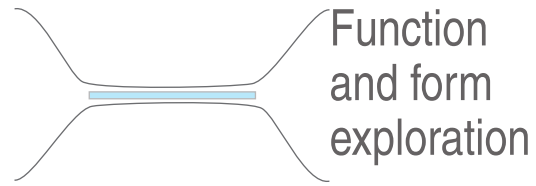
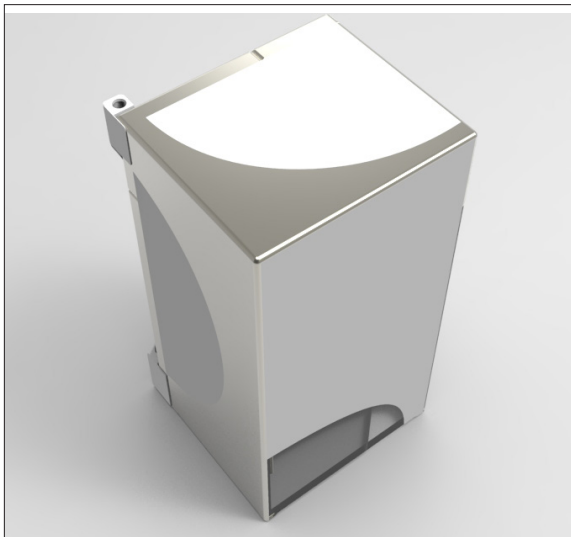
digital & physical process



CONCEPT INSPIRATION

This eco-refrigerator is proposed to generate new ecological behaviors in users. The shapes inspiration comes from natural forms. To achieve a balance between the organic forms of nature and the geometrics necessary to create a traditional refrigerator, the design is based on the method of generative geometry. This process allows to create a basic geometric shapes combined with organic patterns taken from nature, as a result is possible generate kaleidoscopic winding surfaces.





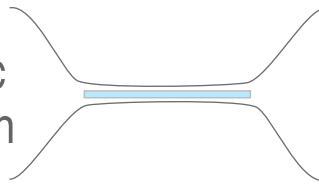
inspirational containers



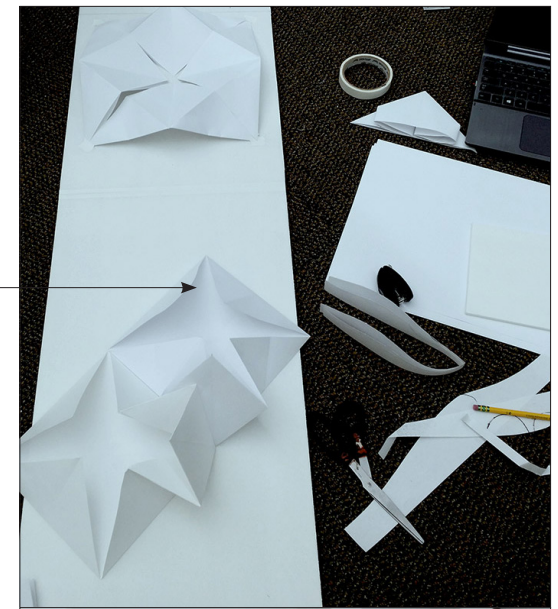
fresh herbs



Geometric exploration



Geometric study

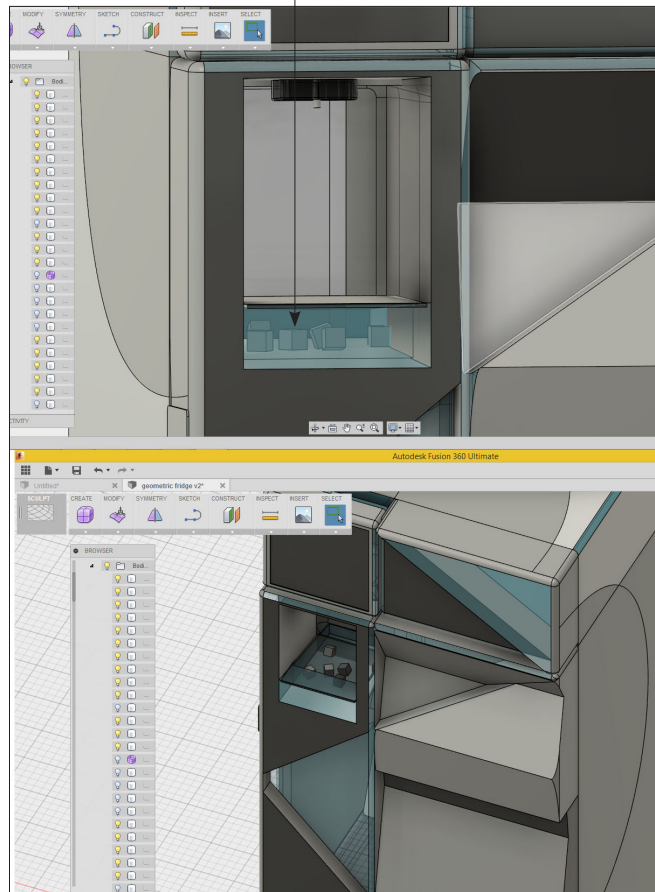
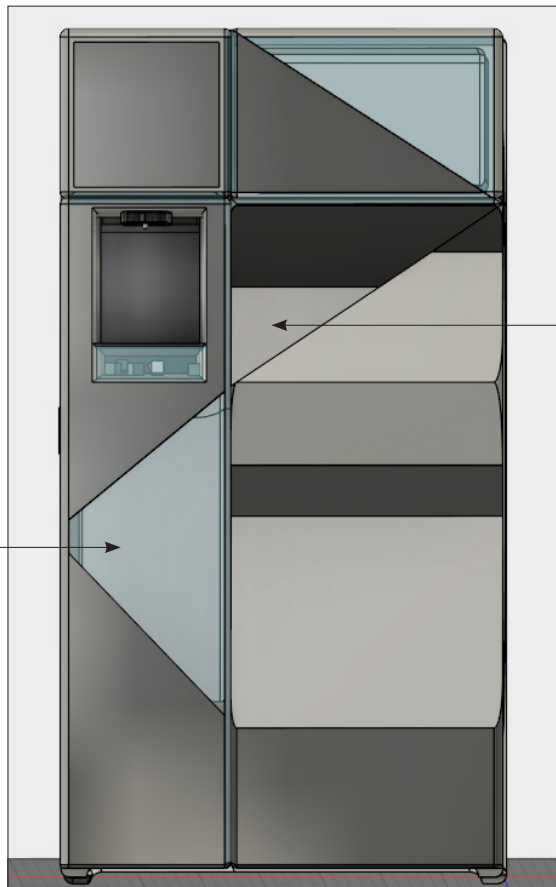


bending cartons for studying surfaces

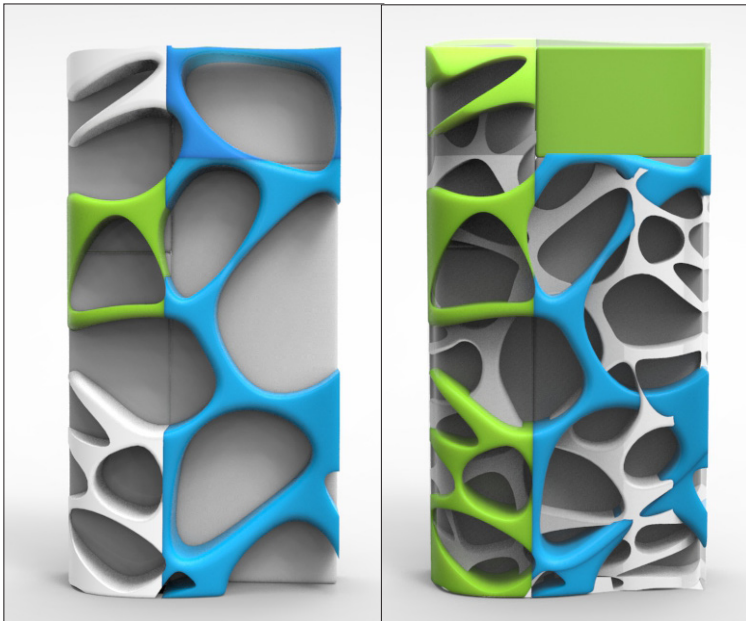
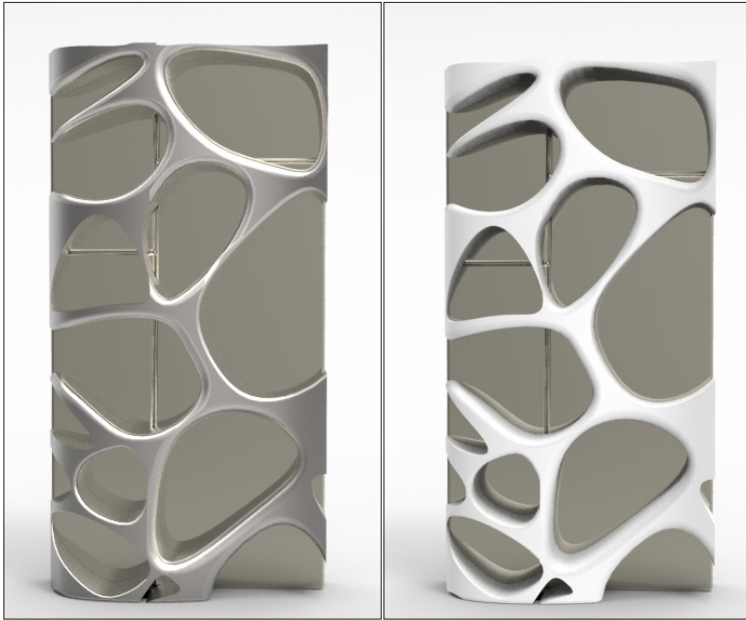
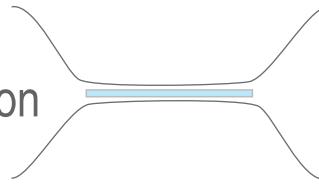
Ice Stones (green ice)

Mushroom garden

glass window



Organic
exploration



generative
geometry.





FINAL SHAPE

Interface screen

Water dispenser

Stones: green ice

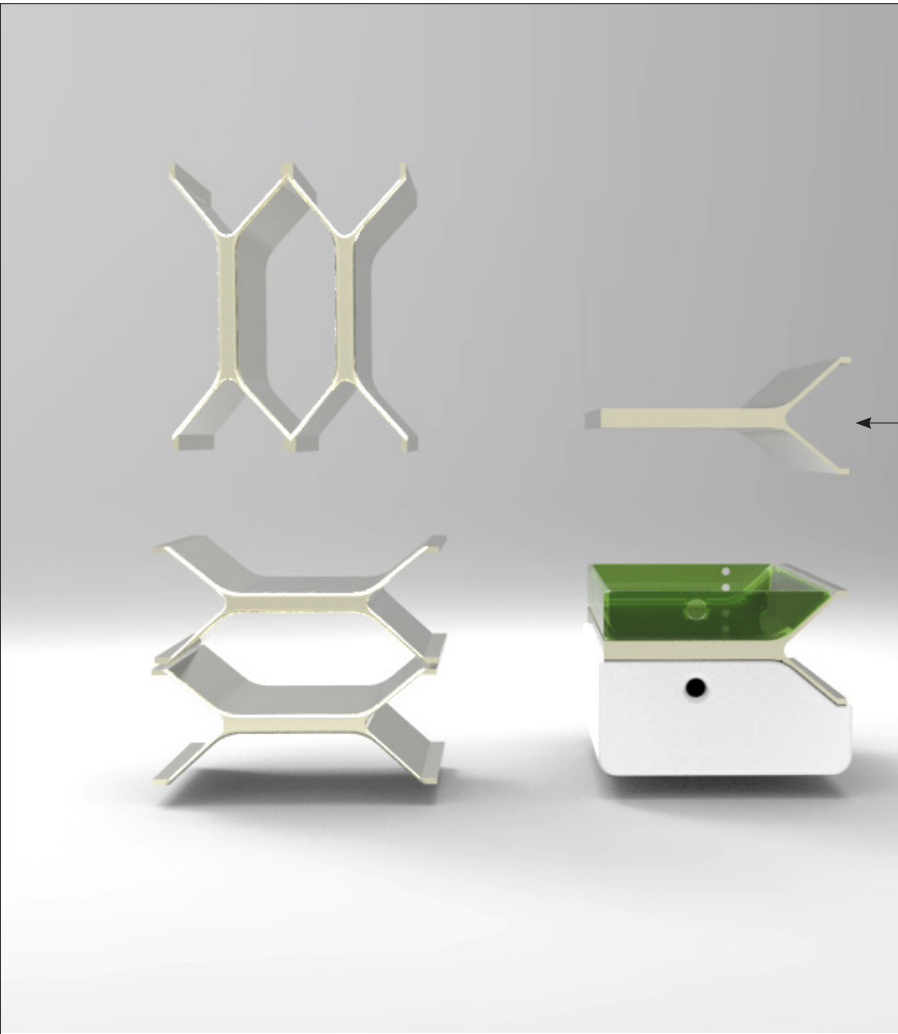
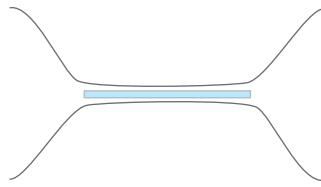
Area for dried herbs
and spices.

removable containers

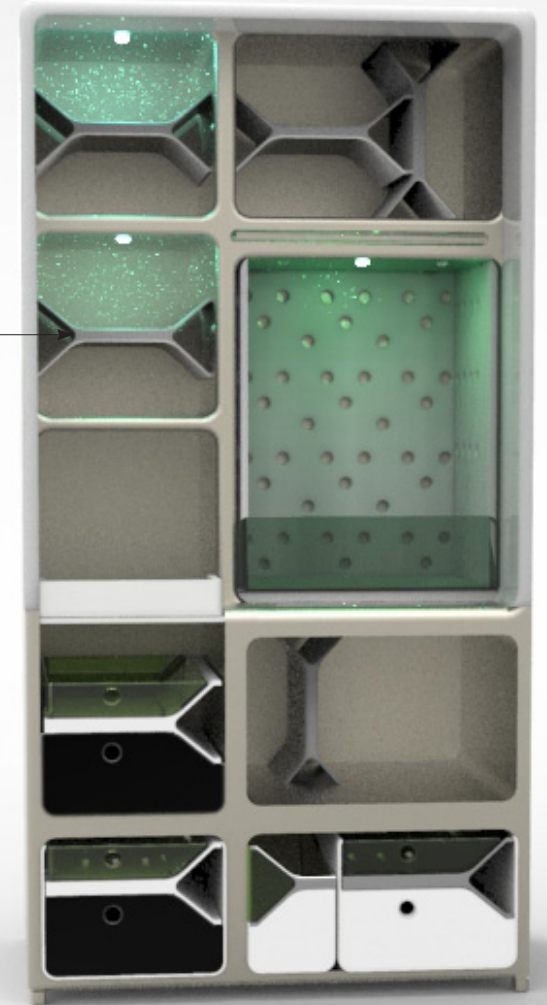


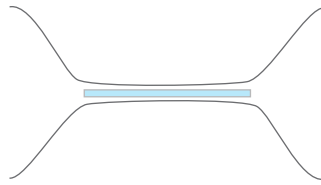
Exploded View
(Interior)



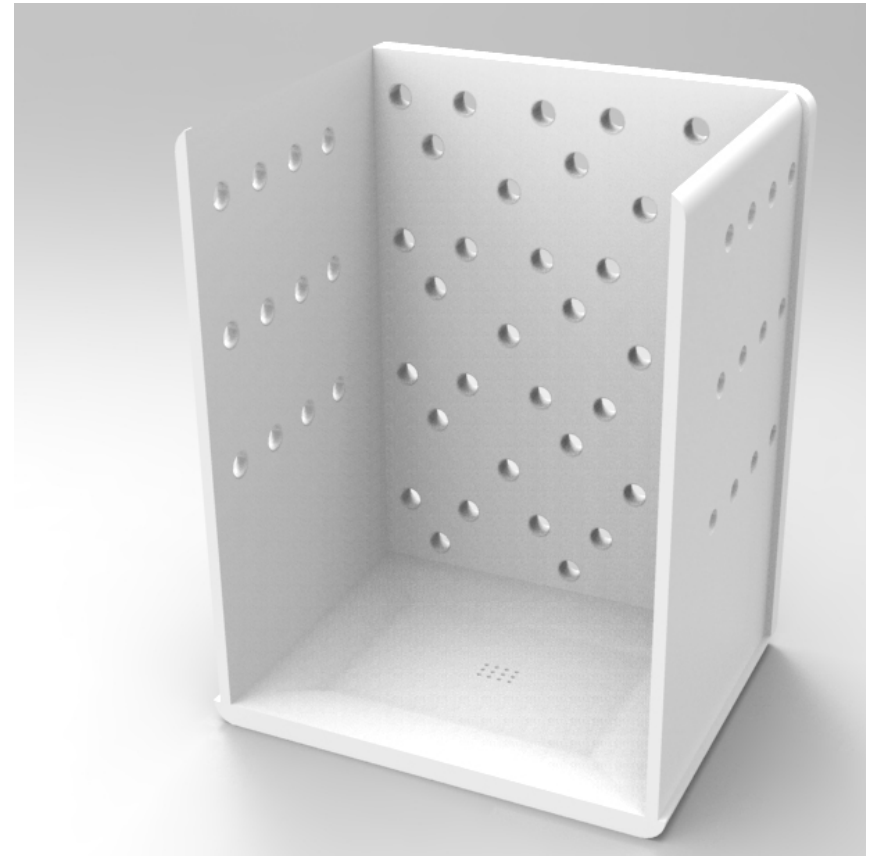
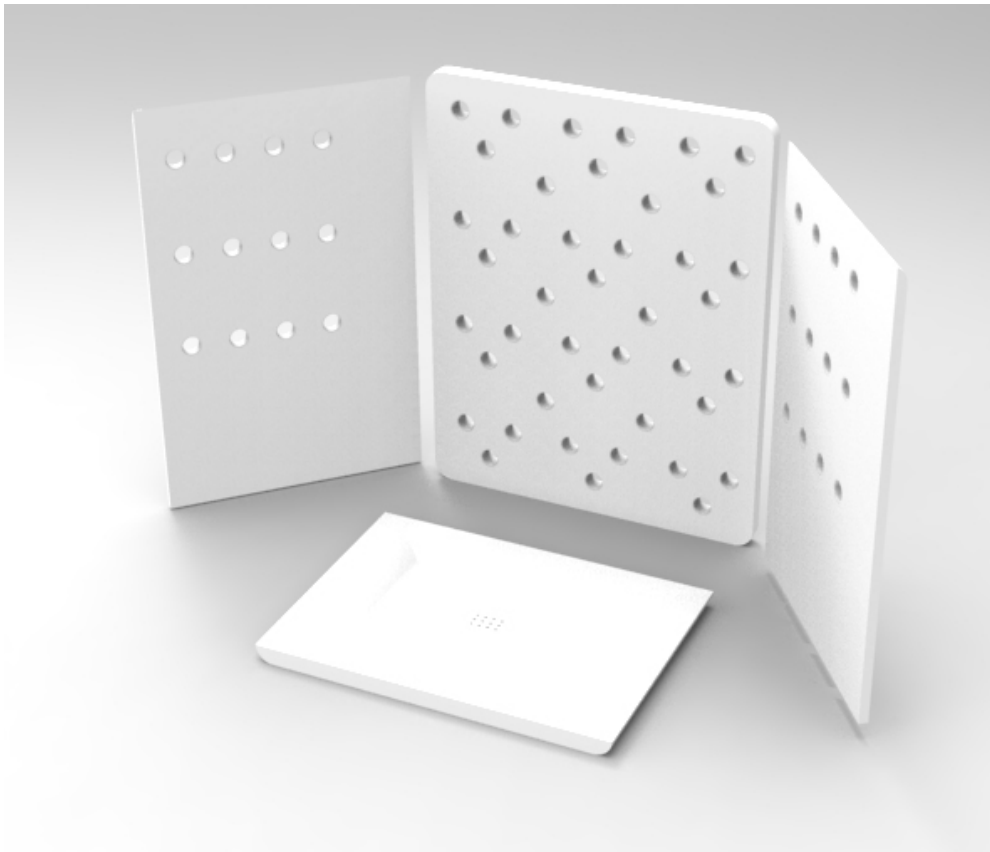


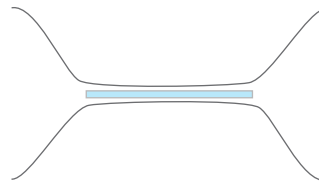
Modular Shelves: this refrigerator is a modular system that allows adjustments separators any space inside the refrigerator. This adds flexibility and reduces production costs.





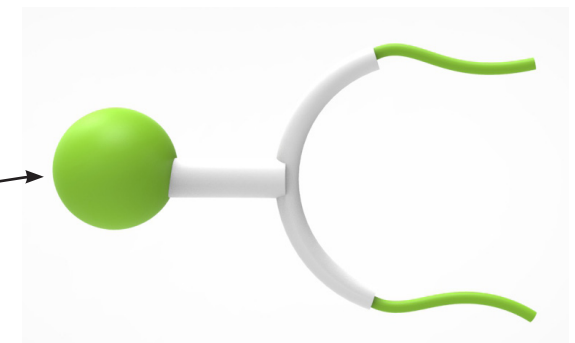
Green Garden: The walls are made of Silicon and are easily removable for easy cleaning. These can be cleaned in the conventional dishwasher. This feature is repeated in all freezer compartments.

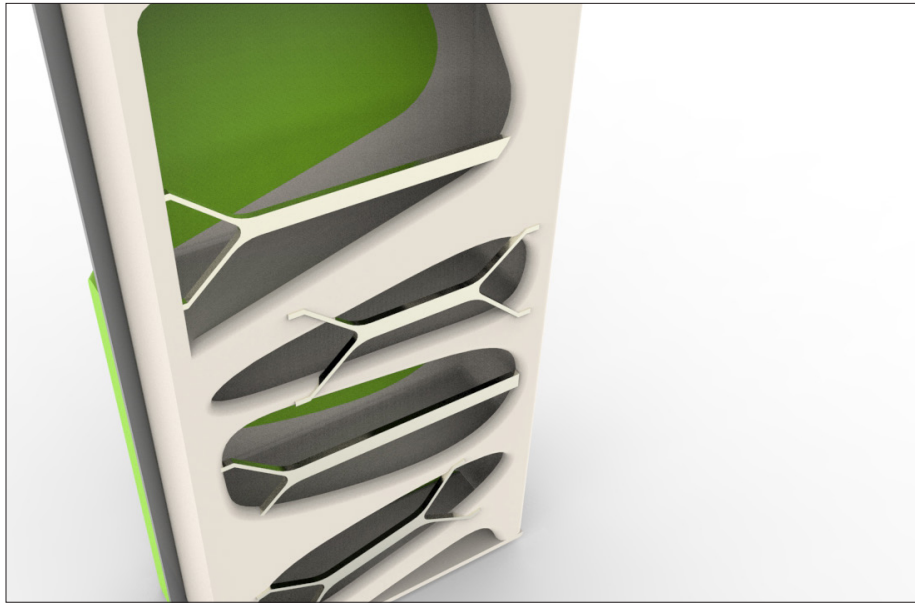
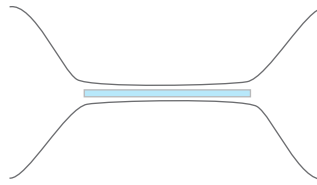




Green Garden: one of the most valuable features of this refrigerator. You may manetner vegetables and fresh and clean thanks to its self-cleaning and irrigation fruits. The goal is to entice the user to consume more vegetables and fruits.

Flexible Module: for holding the vegetables and fruits.



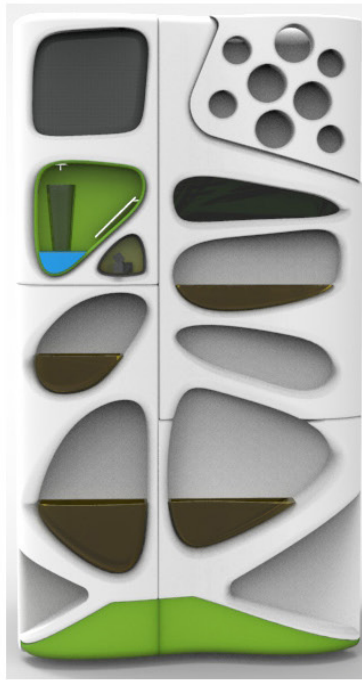


Doors: The doors remain the same organic style of the exterior. Security bars are elastic compartments and removable

Drawers: are made of metal for the freezer are made of plastic for the refrigerator. The interior walls of each compartment are made of silicon and are removable for easy cleaning.







Color and material alternatives.



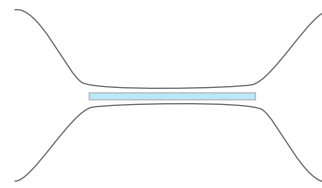
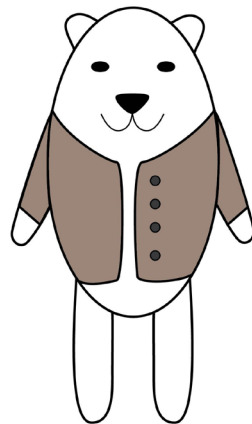


Physical Prototyping

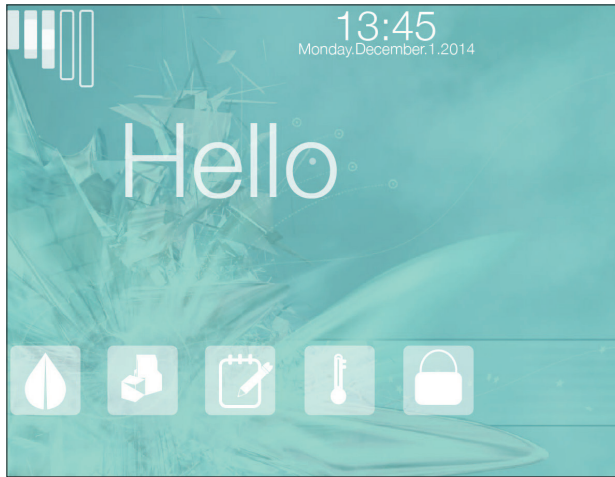
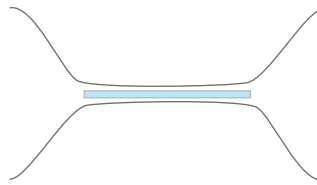


FINAL

INTERFACE AND ADVERTISING CONCEPT




“The inspiration of the interface came from the general motif of the fridge itself. We associated a fridge with cold, ice, snow and frost. The colors and graphics for the background came entirely from that. The purpose of each section of the interface (the Home Screen, the Temperature feature and the Statistics feature) is to give the viewer a sense of what the interface would look like. With the temperature feature, you can touch any module on the refrigerator and then adjust the temperature accordingly. With the Statistics, we provide the user with an overall rating on their sustainability efforts. This overall rating takes into account three sub-areas, which are energy consumption, water consumption and waste consumption (which comes from the log book, and how much food is wasted due to expiration.)”



General Electric FR 27.7 cu ft Sustainable Division Door Refrigerator

specific dimensions located inside model

- See associate for more information regarding product dimensions
- **Change your lifestyle** to be more sustainable and **eco-friendly**
- Enjoy fresher food **longer** with new **platinum interior cooling system**
- Misting feature that mists your **produce** just like in the **grocery store**
- Divided doors to **save both energy and money**



EASILY LOCATE YOUR FAVORITE FOODS

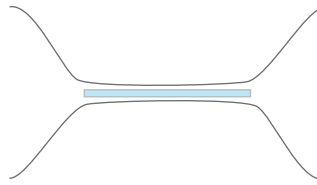


with these illuminating **LED lights** inside your fridge, you will not only be supporting **sustainability** in the kitchen, but your food will **never be hidden** by shadows!

THE ULTIMATE FRIDGE FOR FRESH STORAGE

this fridge is designed with the **division of doors** for each section to keep your various types of groceries **fresh and lasting long**. now, each type of food you want in your fridge will have **special care**, which also **reduces energy waste, saving you money!**





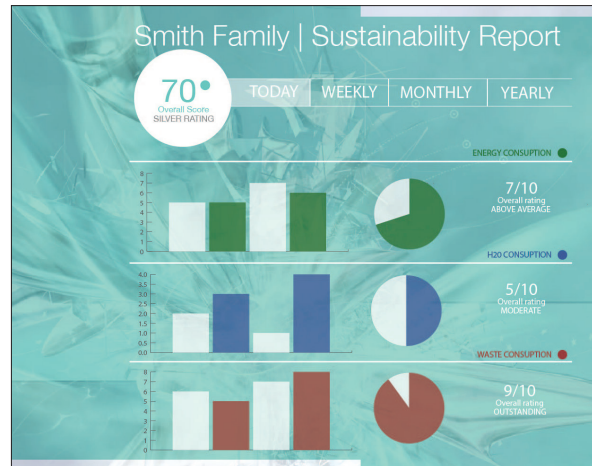
HEY! GUESS WHAT?

there's a **special section** just for all your fruits and vegetables in this fridge, that **takes the excess water** from the drain in your water dispenser and **mists** your produce to help keep it **fresh, cool and clean**; just like in your own local grocery store!

A REALLY COOL INTERFACE

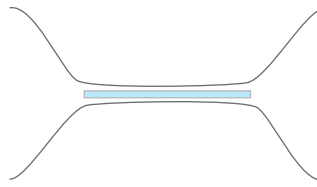
this interface gives you all the features **you need**, and even has statistics on **how much energy you save** and how you can **reduce even more energy and food waste to save even more money!**

A **log app** is also included, so you can record the produce **you buy** on your **smartphone** at the supermarket, and it will even **notify** you when your food is soon expiring!



HEY YOU! CHECK THIS OUT

this fridge gives you a "green option" for ice: the option to choose to be **more sustainable!** We have included natural "ice stones" to promote saving water. These awesome stones **cool** in any drink and **never melt** so your drink **never gets watered down!**



PLANTS



that's right, **herbs** have been placed organically around this fridge. these herbs are all **organically grown**, and can be used entirely for ease and more **sustainable cooking!**

OH, LOOK MUSHROOMS

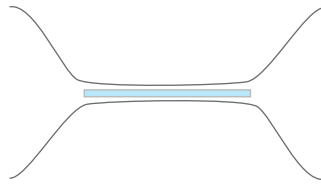


this adorable, **sustainable** and **functional** small garden embedded into your fridge will not only bring a dash of **nature** into your kitchen, but also allow you to **grow mushrooms, fruits or other vegetables** and use in your own recipes.

SAVING YOU TIME, ENERGY AND MONEY

this fridge is divided into **sections**, helping it to take special note of each type of produce you buy. each section caters to meats, fresh fruits and vegetables, or the freezer and more. this **saves you time** when you're looking for a specific kind of food, but it can also **sustainably save energy**, which can **save you money**, while keeping your produce as **fresh** and individually **cared for** as possible!



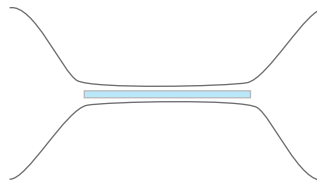


GE APPLIANCES FOR SUSTAINABLE LIVING

“**VERDANT, THE ECO- REFRIGERATOR**”



Team EYE: Erin Glaberson / Emily Kvale / Yolegmma Marquez



COLLABORATION RIT School of Design and General Electric. FALL 2014

