Log Book

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3rd Hour EDD
Link to video: https://youtu.be/UVMIrHE8VEA

Identifying

What is the problem at hand?

Recently, we took a trip together and noticed that when we were buying cereal, we would always end up with too much milk left over after finishing the box, or we would end up with too much cereal, making it soggy. It seemed pretty wasteful because we would no longer want to eat the cereal, so we figured that there had to be a way to improve this. We took a survey and found that about 90% of our participants had struggled with this in the past, and hated soggy cereal.

Understanding

What research has been done regarding past solutions?

A. There are a few different containers that have the milk attached to the cereal to keep the cereal from being soggy, but they are each around $20 and they would be in places like hotels. You would have to go out of your way to buy them. https://thecrunchcup.com/products/crunch-cup is one of the products. Our product is different because theirs is a sippy cup design where the people drink the cereal and ours will be more of a bowl
B. https://www.amazon.com/Cereal-Breakfast-Portable-Yogurt-Container/dp/B077PQYKSV is another container that holds the milk and cereal separately, but the container does not drop the milk into the cereal. In order to put the milk in the cereal you would have to detach the attached milk container then pour the milk into the cereal. The container also looked very small, the cereal compartment is about the size of a hand. This is about $15
C. https://www.amazon.com/LOCK-HPL973-Airtight-Container/dp/B01M69VJFN/ref=pd_sbs_79_4/134-9679526-1671134?_encoding=UTF8&pd_rd_i=B01M69VJFN&pd_rd_r=1cfe89c7-e29b-42fe-96fc-8c463fd2abe8&pd_rd_w=NaTXA&pd_rd_wg=6A0dH&pf_rd_p=7cd8f929-4345-4bf2-a554-7d7588b3dd5f&pf_rd_r=WJQV9TE7AJ8GX3TCQYXF&psc=1&refRID=WJQV9TE7AJ8GX3TCQYXF this container is just a container that is really

secure so it can hold liquids. We want our project to separate the cereal from the milk so that the cereal won't get soggy.

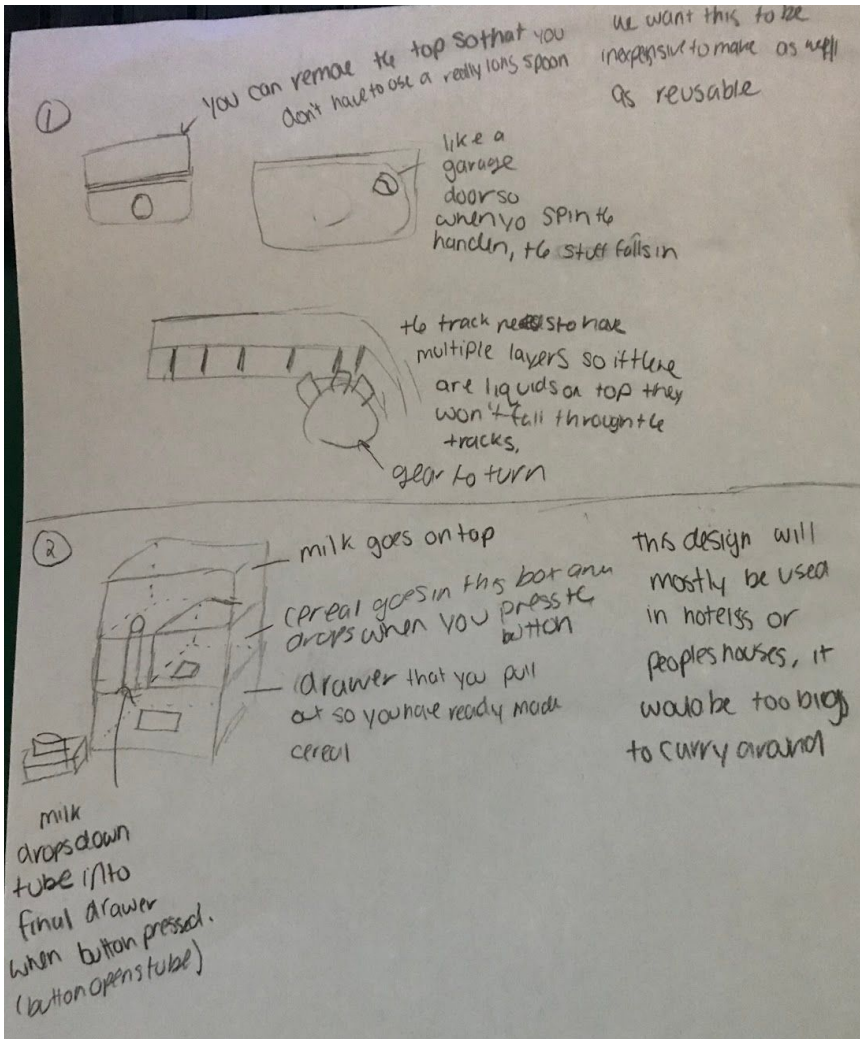
D. We also learned how a gumball machine works because the mechanism that drops the gumballs is similar to what we were thinking of doing but without the need to put a coin in our container.

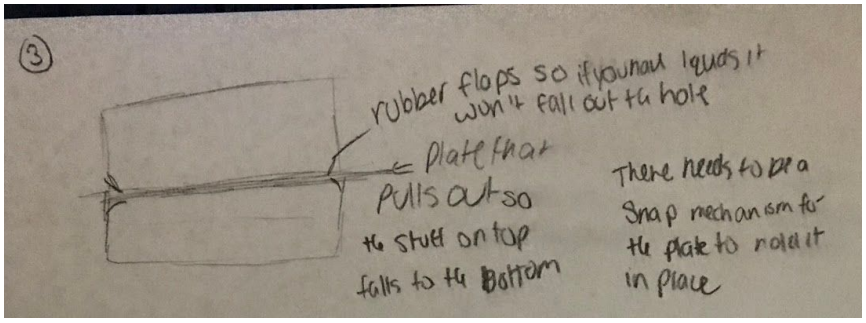
Overall, our new product will be something that is aesthetically pleasing to look at as well as being able to function properly.

Ideating

Brainstorming Original Ideas, Elimination Process

Here are our ideas on how the container will work.





Idea 1

This mechanism we came up with would be like a garage door where if you twist the handle, the “door” would open or close depending on which way you spin the handle. The “door” would be able to bend so that it can bind to the sides of the container to move out of the way.

Idea 2

Our second idea would be a more stationary option that would be placed in hotels or houses. There are three layers, the top is for the milk, the middle for the cereal and the bottom is the drawer that you would pull out with ready-made cereal. There would be a tube connecting the top layer to the bottom layer so that when a button is pressed the tube would open so that the milk would fall from the top layer to the bottom layer.

Idea 3

This idea has less moving parts. There is a plate that separates the two layers. You can pull the plate out which would allow the cereal to drop to the bottom layer. We would have to figure out a way to connect the layers so that the milk doesn’t fall out of the sides

Final Design

Decision Matrix	Ease of Build	Aesthetic	Function	Ease of use	Final Score
Idea #1	7	8	9	8	32
Idea #2	5	7	7	8	28
Idea #3	9	6	7	8	30

Designing and Building

Design Constraints, Product Construction Process

Detailed List of Design Constraints:

1. Gear mechanism may be somewhat difficult to install, but the design is simple; looks clean; does the job efficiently; simple turning motion
2. Drawer system with multiple levels seems complicated; bulky, not very appealing; seems overly complicated, which may affect function; relatively easy to use, since just push of a button
3. Super simple design makes it easy to build; kind of ugly, not very clean looking; snap mechanism must be installed, decreases efficiency; mechanism may make it hard to clean, use, etc.

Product Construction Process

Conclusion, Future Planes, and Takeaways

- ❏ Begin building first prototype
- ❏ Test using real cereal - will it work?

February 10, 2020

- Researched existing solutions
- Began sketching ideas for final design

February 11, 2020

- Finalized idea for design
- Created justification and timeline for project

February 12, 2020

- Began designing working illusion

February 13, 2020

- Finished working illusion

February 14, 2020

- Began working on poster

February 17, 2020
- Continued working on poster and created script for video

February 18, 2020
- Finished poster
- Filmed video
- Submitted Invention Convention Documentation

KWR Chart

Idea one: Robot that chases your dog or that the dog chases

What do we know about the problem?
Dogs have a lot of energy and people don't. Dogs want attention 24/7 and will cry and bug you till you give it to them.

What do we need to figure out?
We need to figure out how to make a robot that would react to the dogs movements. To do this we will first need to figure out what vex parts would work best with what we imagine our final product to be.

What resources do we need?
I think we will only need Vex parts to build the robot. In the future we may find that we need other materials to make the robot look better

Idea Two: container that holds cereal and milk separately

What do we know about the problem?
Whenever I travel or wake up late in the morning and have to grab a bowl of cereal, I just end up eating dry cereal because I don't want the cereal to be soggy when I get to school.

What do we need to figure out?
We would need to figure out what mechanisms to use to connect the milk container to the cereal container so that you don't have to separate the two different containers.

What resources do we need?
For this project we would need to use cardboard for the working illusion as well as pre existing plastic food containers so that we can improve them and make them for our project.

Idea Three: Skis that you can take apart

What do we know about the problem?
Skis are really heavy and difficult to carry. This is especially true if you are a parent that has to carry their kids skies as well as their own.

What do we need to figure out?
We need to figure out what makes a ski good to make sure that the ski will still function. We then need to figure out how we should connect the pieces after they have been detached.

What resources do we need?
We will probably need old skis or maybe use the 3D printer to make a model of what we want the skies to look like.

Planning

Project Title/Topic	Cereal Swirl

Goal	
Goal: Formulate an inquiry question or statement that clearly shows your goal, based on your personal interests. Be concise but specific and clear.	The goal of this project is to create a container that is able to hold both solid and liquid food separately. We want the container to be easy to use and so one doesn't have to pour the cereal into the milk, the cereal will just drop into the milk.
What is the purpose of the goal? What do you hope to achieve?	We want to be able to eat cereal and milk on the go as well as other food and liquids that go together(yogurt and granola).
What prior learning and subject specific knowledge is relevant to the project?	We have learned how to use Fusion 360 which we will need to use to CAD our design. We also know

How does the project relate to an academic class you are currently enrolled in or have taken?	how to 3D print which could potentially help with creating the mechanisms we will use to create our container.

Global Impact	
Identify how this will impact the community/world:	This could potentially reduce the amount of waste because people will be less likely to throw away their cereal because it is no longer appetizing

Product/Outcome	
What product/outcome will you create in response to the goal, global context and criteria?	We will create a container that can hold both liquid and solid foods
Form: Function: User/Audience: Costs:	A container Hold liquid and solid foods everyone ~10$

Research	
What will be the focus of your research?	Existing solutions as well as trying to figure out a mechanism that would hold the containers together and a mechanism that would drop the food at the top to the one in the bottom
Media: (Includes books and articles, etc.)	https://thecrunchcup.com/products/crunch-cup https://www.amazon.com/Cereal-Breakfast-Portable-Yogurt-Container/dp/B077PQYKSV https://www.amazon.com/LOCK-HPL973-Airtight-Container/dp/B01M69VJFN/ref=pd_sbs_79_4/134-9679526-1671134?_encoding=UTF8&pd_rd_i=B01M69VJFN&pd_rd_r=1cfe89c7-e29b-42fe-96fc-8c463fd2abe8&pd_rd_w=NaTXA&pd_rd_wg=6A0dH&pf_rd_p=7cd8f929-4345-4bf2-a554-7d7588b3dd5f&pf_rd_r=WJQV9TE7AJ8GX3TCQYXF&psc=1&refRID=WJQV9TE7AJ8GX3TCQYXF

Surveys: Would surveying your potential audience be useful?	Yes, since we could get a good grasp on how people would view or product, as well as receive any tips on how we could improve our product
Interviews: What human resources can you tap into for your project?	Fellow classmates and teachers
Other sources for research?	The internet, YouTube videos, etc.

Specifications

Prompts	Student Designed Criteria	Test or method of evaluation
Form: What will your project look like? What materials will you use? What size will your project be? What tools will you use? How will you assemble your project?	- A container with two levels - Pre existing containers and 3D printed parts - About the size of a lunch box or smaller - We will probably use hot glue and screws - By screwing it together and gluing it	- We will test if the food in the containers spill or not and weather the food can drop from the top container to the bottom - We will also conduct a survey to see if people would buy our product. This test will test the market for our product.
Function: What is the purpose of your project?	- To allow people to eat on the go	- Take a survey to see how people like our product
User/Audience: Who is your project for? What needs do you expect your project to satisfy? Where/why will you project be used?	- everyone - People who don't like soggy cereal - It could be used in the car and almost anywhere socially acceptable to eat food	- We will create a survey to see if people would buy our product.
Costs: How much will your project cost to make? ***How much will you sell it for? ***How much profit could be made on your item/project?	- $~5? - $~10? - $~5?	- Create a shopping list and budget that tells us how much we spent