

Narragansett Bay Project

By: Faith, Landon, Madelyn, Phoebe, and Ryleigh



Decreasing The Amount Of Plastic:

- Americans discarded 51m tons of wrappers, bottles and bags in a single year only which is around 309 lb of plastic per person.
- 95% of this trash ended up in landfills, oceans or scattered in the atmosphere in tiny toxic particles.
- Gas stations and Grocery stores across the entire country are selling and using an excessive amount of plastic that has had very significant effects on our environment.
- By starting with a simple change like the material of the cups at gas station, we can make a huge change throughout the state, and hopefully spread the idea to other gas stations and grocery stores.

Why did we choose Cumberland Farms?

- 16 Cumberland farms in RI
- Cumberland farms uses plastic and styrofoam cups for all of their fountain drinks, slushies, and coffee.
- Our design idea is to ensure that all plastic bought at a Cumberland Farms is disposed of properly.
- Proper Disposal
- SmartPay Rewards
- This will help us work towards our goal of keeping microplastics out of the Narragansett Bay

SmartPay Rewards

Cumberland Farms

4.5★

500K+

E

22.7K reviews

Downloads

Everyone 10+

Install

Share

Add to wishlist

You don't have any devices

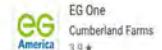
SmartPay
REWARDS™

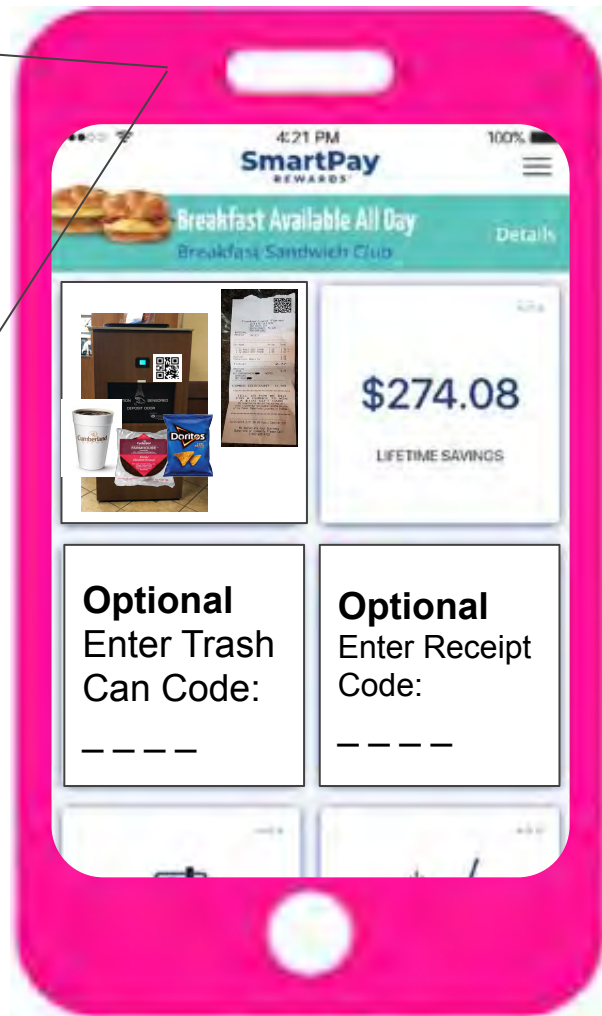
EG



App support

More by Cumberland Farms



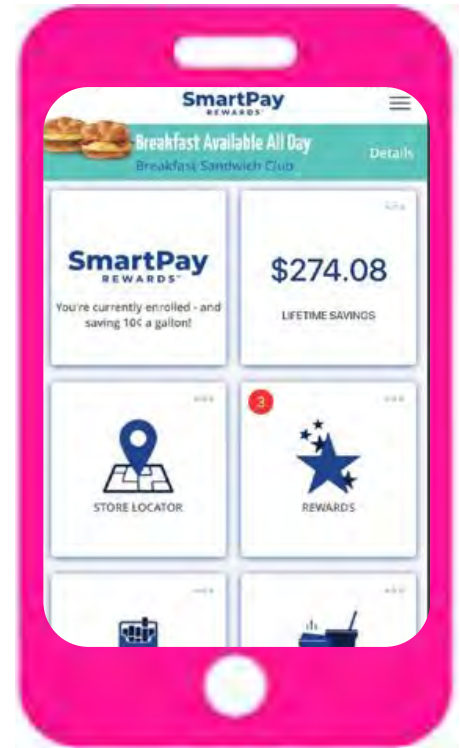


App Prototype:

Why is this important?

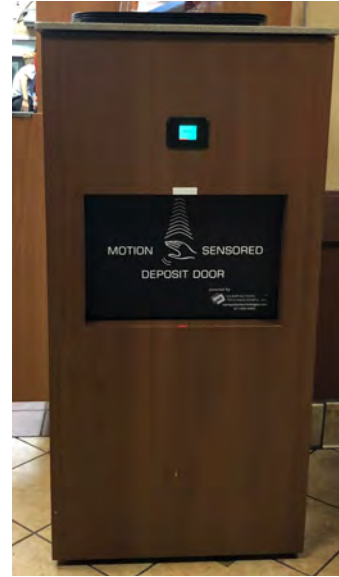


- Rewards sustainable actions
- cheap and easy to implement
- The app is already in place
- Keeps plastic away from the bay



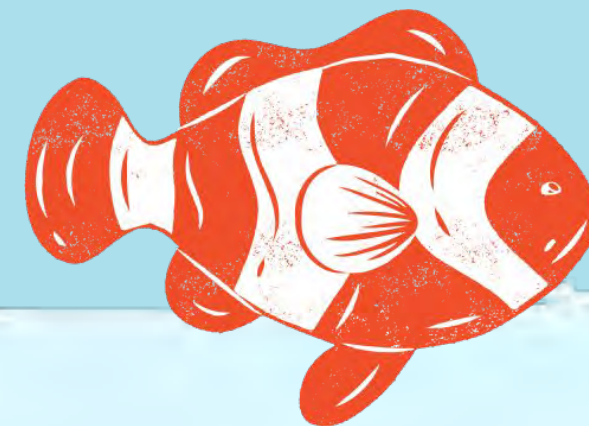
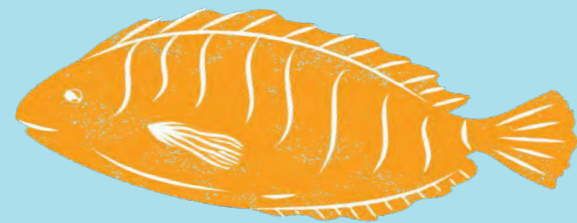
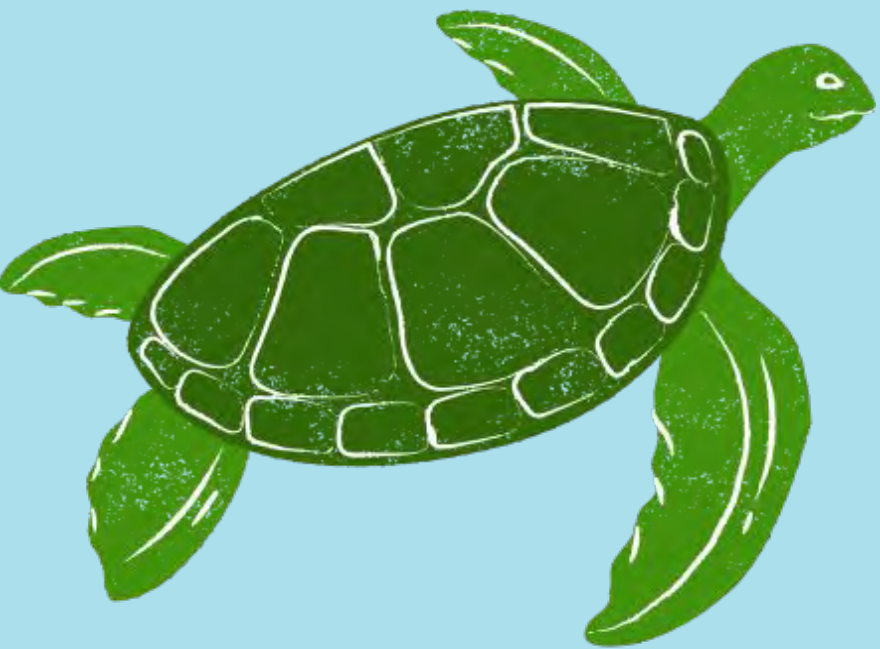
Anticipated Universal Impacts

- Decreases marine plastic pollution from the point-based incentives
- Increase recycling
- Increase amount of trash that makes it into trash cans so it can properly be disposed
- This system can create habit, and make people recycle/throw away trash without thinking about it

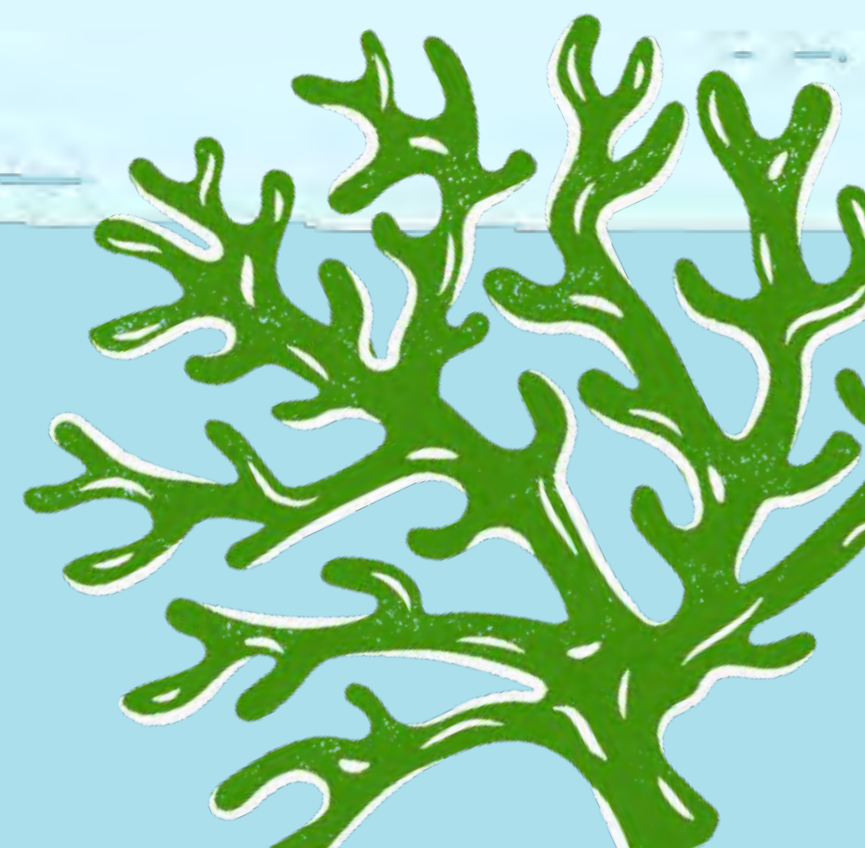


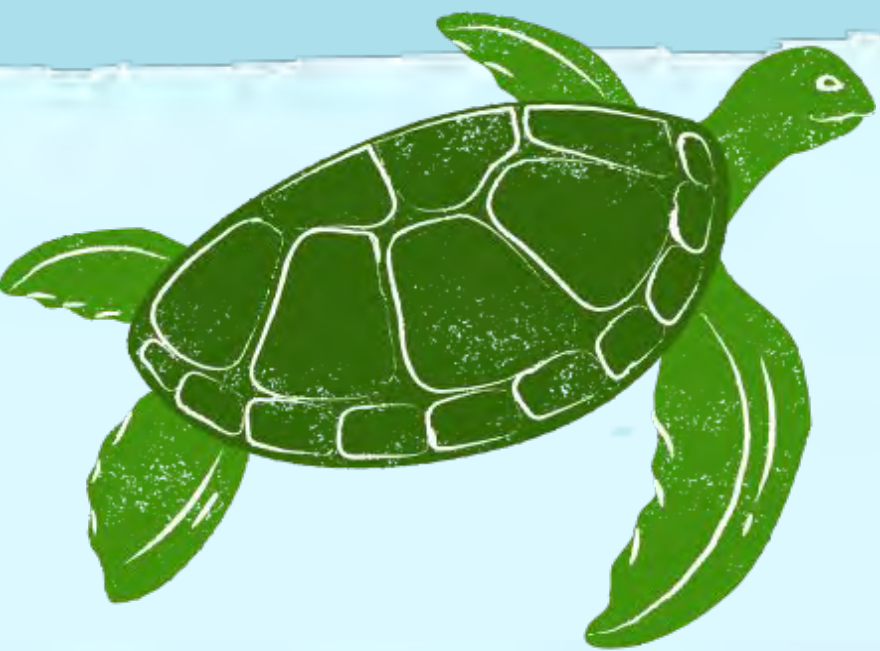
Questions?

Abby Ricci, Callie Cummings, Alicia Flis, Maddy Mcqueeney

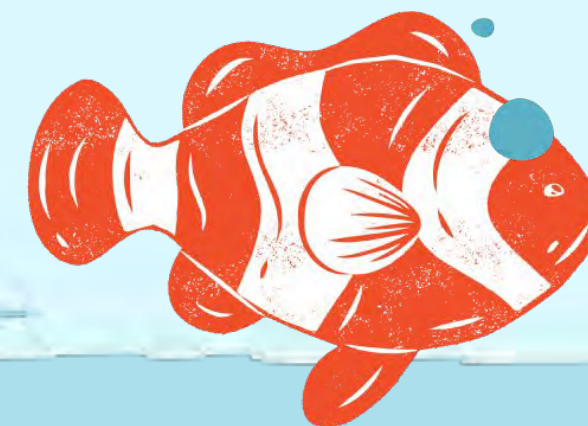


Creative and Impactful Data Visualization





Our thinking process:

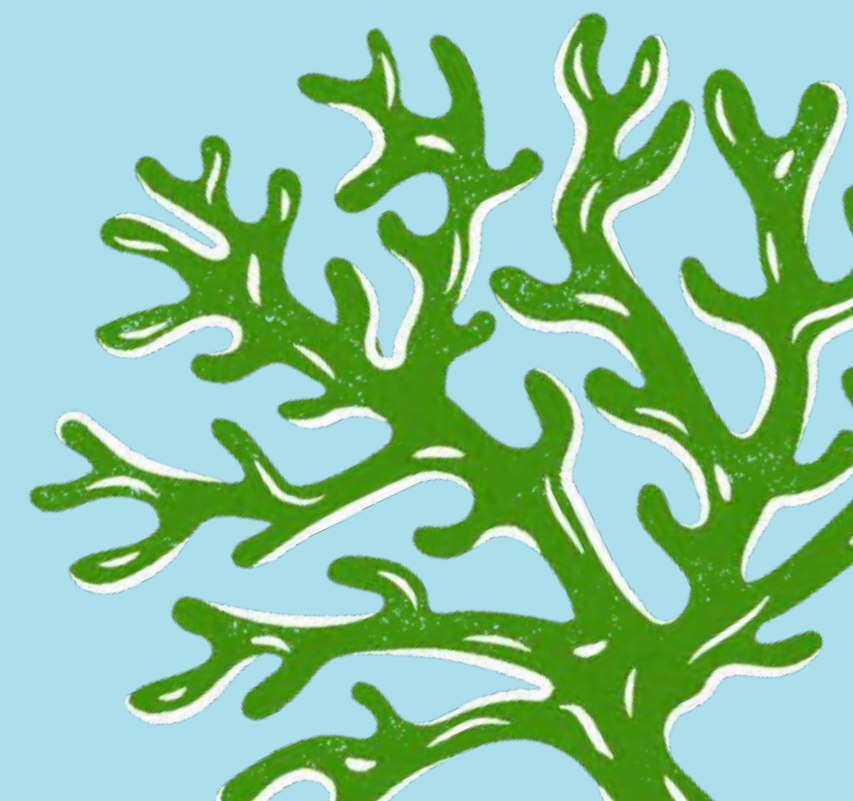


Goals:

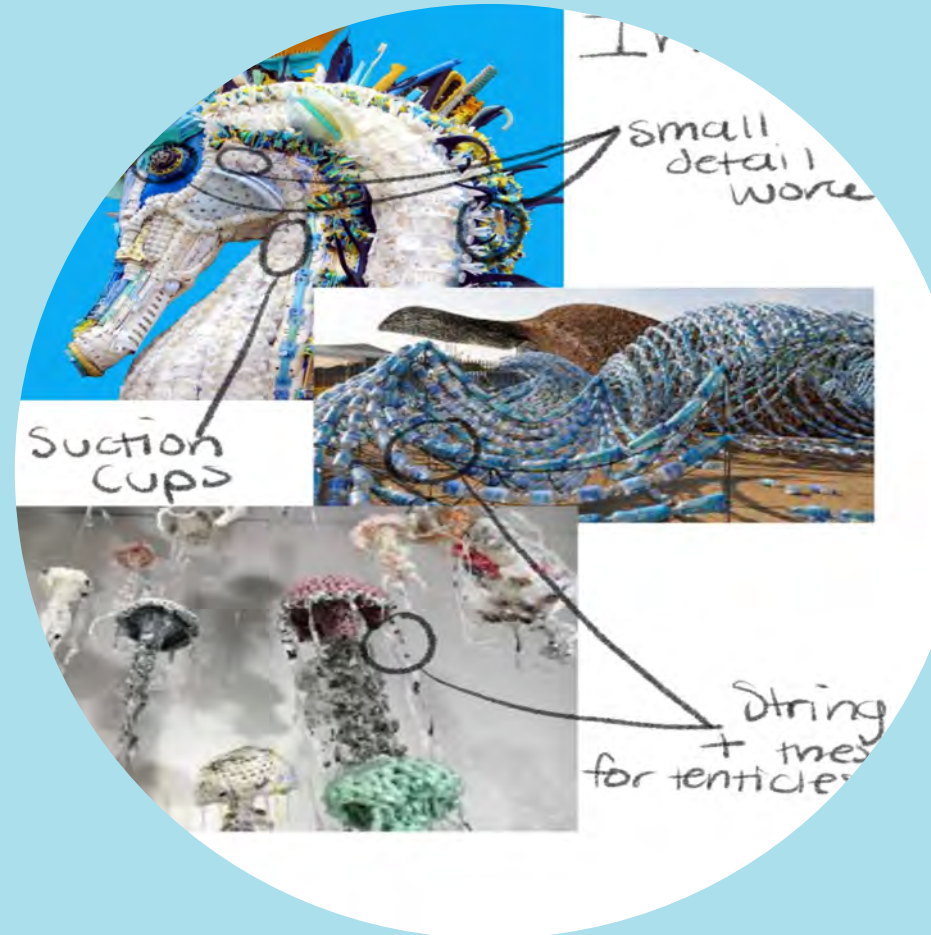
- Raise awareness about abundance of microplastics
- show where microplastics come from
- impact and inspire people who see it

Ideas:

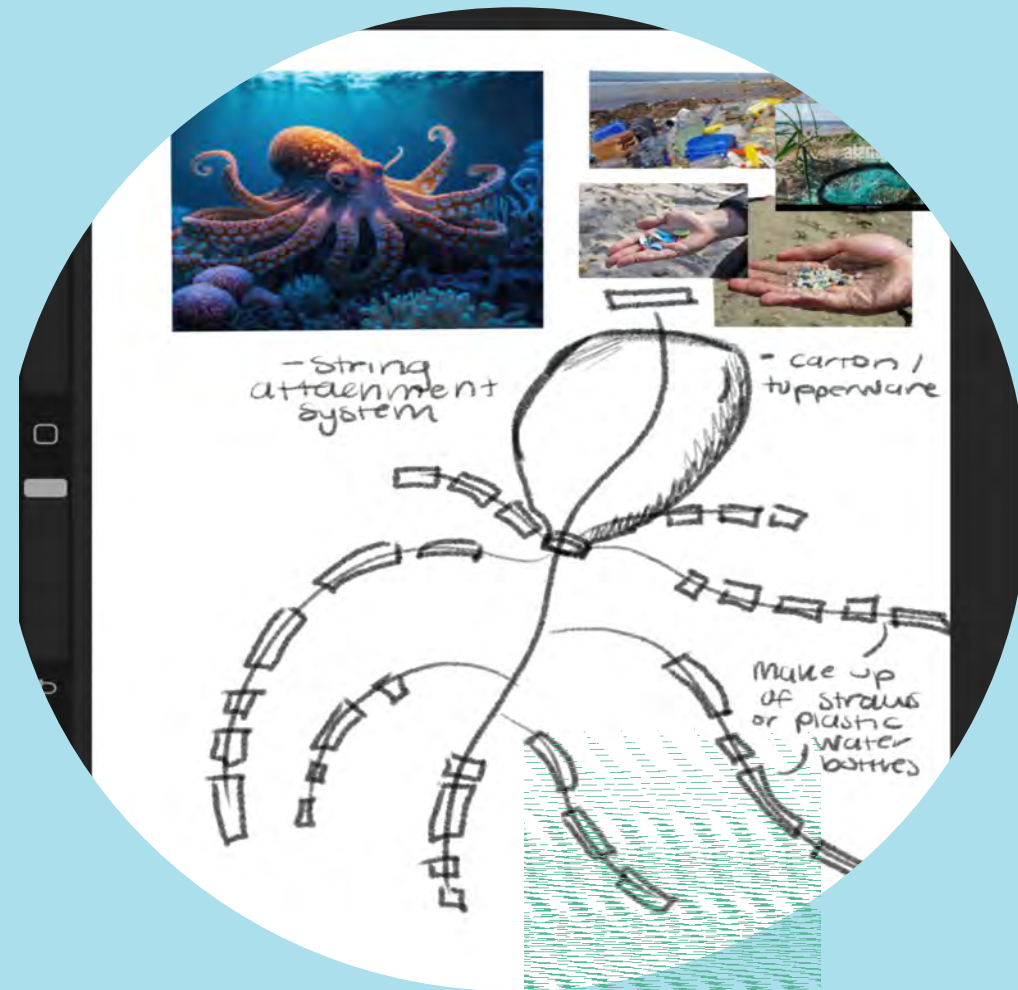
- ART
- data visualization
- display plastics found in some way



Our Prototype Sketches



Sketch of the overall structure: links materials



We researched inspiration for the sculpture: helped us decide what plastics could be used

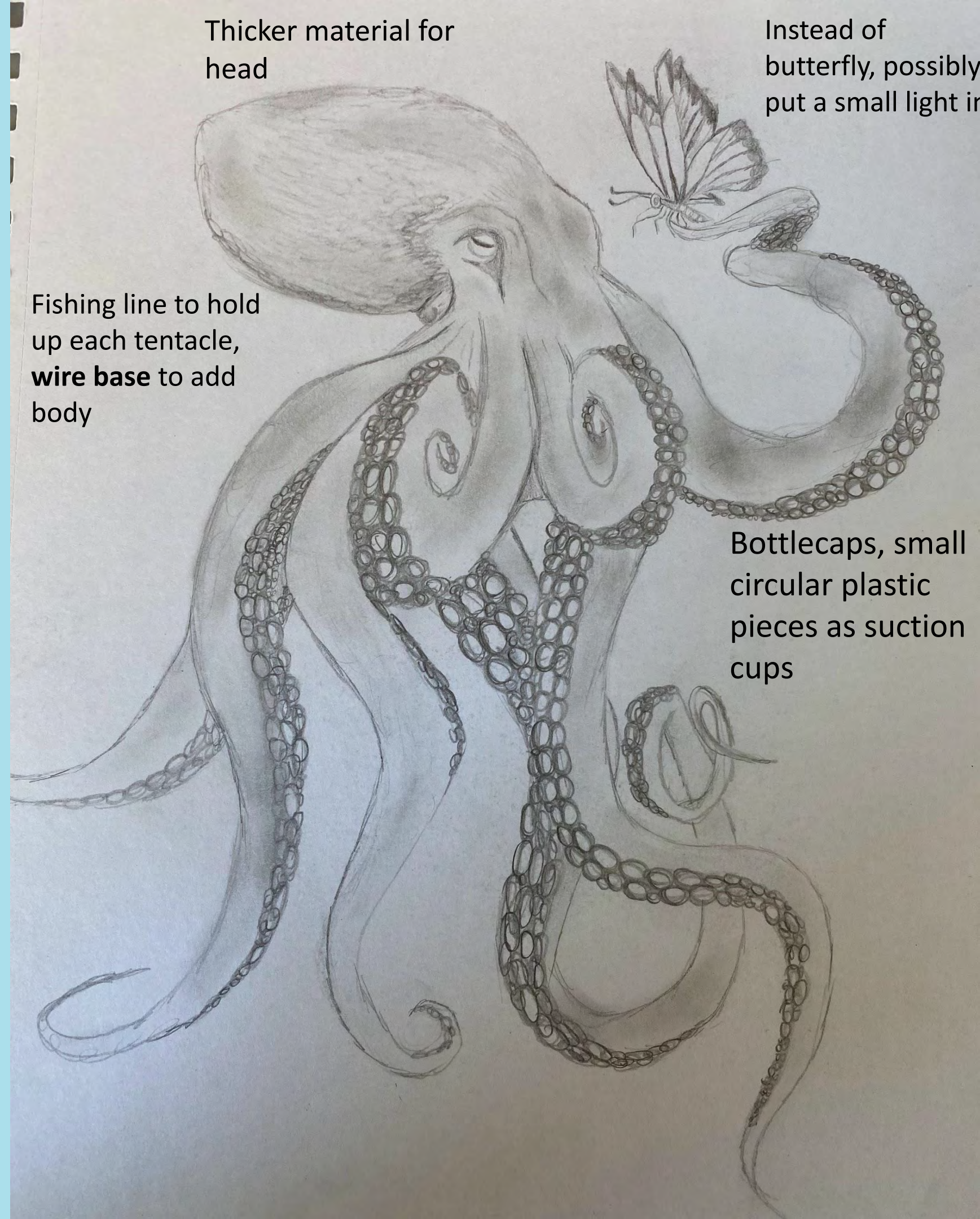


Final rough sketch: describes more detail and shows the process and what we need to collect.

Our Prototypes: Sketches



- Possible issues:
- Weight/lack of support
 - Time frame for completion
 - Sculpture placement (where can we put this to maximize impact)



Thicker material for head

Instead of butterfly, possibly put a small light in

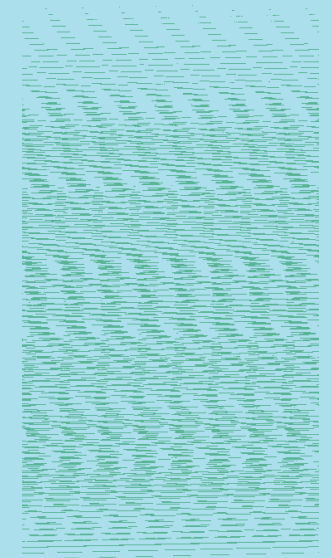
Fishing line to hold up each tentacle, **wire base** to add body

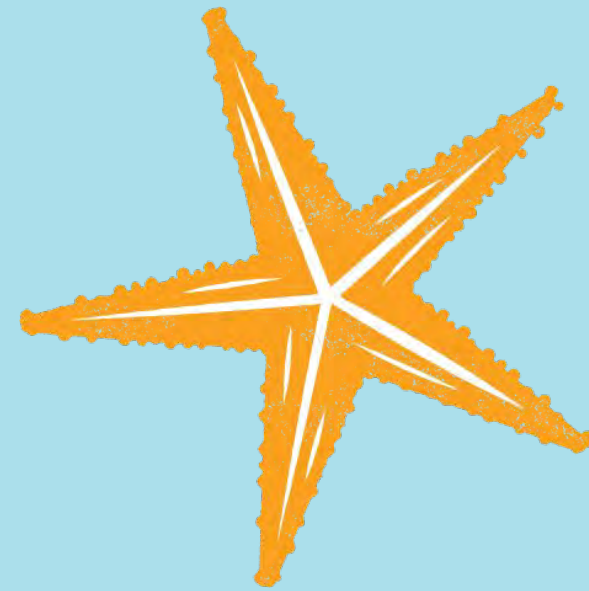
Bottlecaps, small circular plastic pieces as suction cups

Our Prototype Base



This is a the process of making the base for our final sculpture. We made the shape and the detail will be with what will be found for plastic at the beach.





Process of Collection:

- Collecting trash particles from Narragansett beaches
- Sketching an idea to show the amount of trash from just a 25 foot radius on the beach
- The final design will hopefully be showcased in Lippitt Hall or URI to promote the class and project unit

The impact

Collecting plastics from the environment helps clean the beaches and also helps save the surrounding ecosystems. Even though they are big pieces of plastic, they break down into smaller micro pieces which the organisms can eat (fish), which we then eat and consume. This leads to the severity of the micro plastic problem that is being faced.

Overall we want our project to bring awareness to this ongoing issue of pollution by displaying and recycling the amount of trash in a visual.



The background of the slide features several bamboo stalks and leaves in various shades of green. Some stalks are dark green, while others are lighter, creating a layered effect. The leaves are scattered throughout, adding to the natural aesthetic. The overall composition is clean and modern, with a focus on the bamboo theme.

BAMBOO PACKAGING

an alternative to single-use
plastic

project by Julia Martins, Ella Modzelewski, Will Keddy, Yin Chen, and Janvi Biju

Overview

- Narragansett Bay's sands contain more than 16 trillion microplastic particles.
- Runoff, industrial pollution, and littering of single-use plastics are some sources of plastic pollution.
- Due to COVID-19, the amount of single-use plastic waste increase, partly due to the increase of the use of take-away containers
- Microplastics can harm marine life, and eventually ends up in the human body.



Solution Track

- We chose to focus on designing a non-plastic takeout container because they are often made of single-use plastics, which make up a good portion of the plastics that become microplastics in the ocean.
- It is made out of bamboo, which is biodegradable, flexible, and shapeable.
- Bamboo is highly invasive and very fast-spreading in the US, so utilizing it will help balance the native environment.



Prototype

- To provide a visual of our idea, we have prepared a prototype out of cardboard.
- This material imitates actual bamboo in many ways:
 - Flexibility
 - Thinness
 - Length
 - Plant
- The prototype consists of a box and a lid woven out of cardboard strips, with tabs on the side for the lid to latch on.



How It Works

Steps:



Boil the bamboo



Make into strips



Put into machine which compresses it into a shape that we want with layer of adhesive (environment friendly).



Add a bit of adhesive and extra bamboo scraps (fine powder + adhesive starch liquid, food safe) to cover for any potential holes to to use up scraps from earlier productions

- **More job opportunities (people work the machines/checks to see if product ok)**



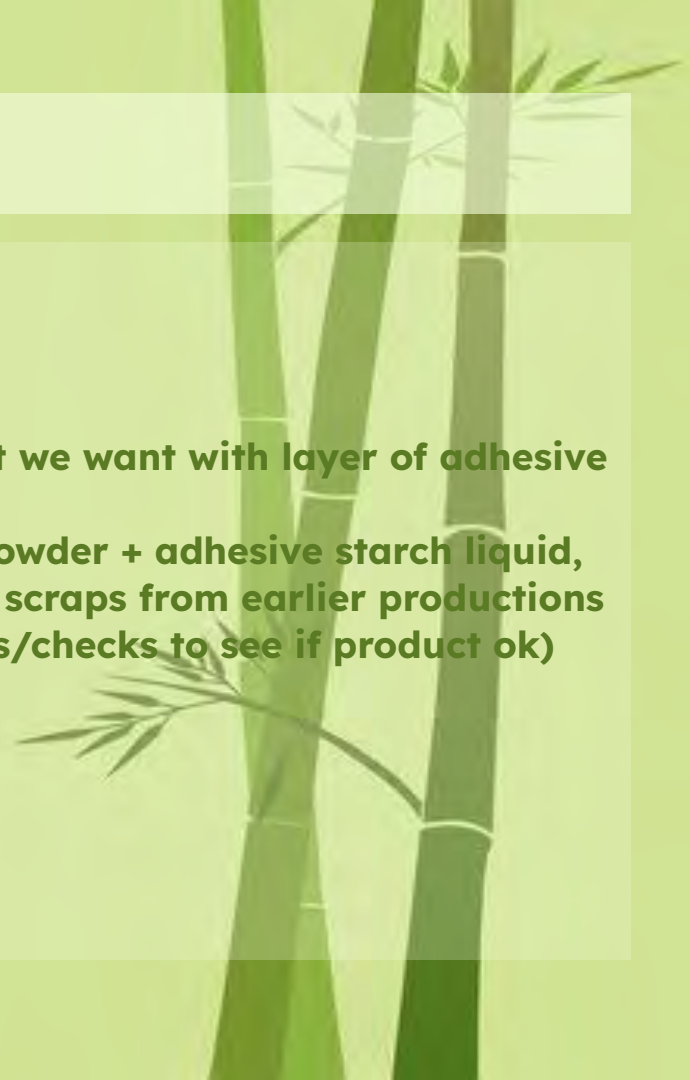
Dry the bamboo container



Sell the container



Profit and there'll be no plastic



Goals/Hoped Impacts



To reduce the amount of single-use plastics that end up in the ocean.



To reduce the amount of bamboo in environments where it is invasive or harming native species



To create jobs that contribute to environmental sustainability.



To provide a business model that can be emulated by others.



To normalize environmentally-friendly alternatives to plastics.



Sources



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<https://ecori.org/2019-4-15-n659bd53hhvfv64seq4ny52zp1o98p/>



<https://www.uri.edu/news/2023/08/new-uri-study-finds-extensive-microplastics-in-narragansett-bay/>



<https://www.oecd.org/environment/plastics/plastics-lifecycle-is-far-from-circular.htm>



<https://marinedebris.noaa.gov/what-marine-debris/microplastics>

Image Sources



1. <https://chatelaine.com/news/what-are-microplastics-faq/>



2. <https://www.restaurantsupplydrop.com/products/9x6-black-hinged-containers-black-half-clamshell-take-out-box-karat-pp-plastic-250-count>



3. <https://www.etsy.com/au/listing/650207653/l160cm63vaired-size-assemble-bamboo?frs=1>



4. <https://chalet-bamboo.blogspot.com/2011/06/manufacture-of-woven-bamboo-plywood.html>

Microplastics Around URI!

By: Jada, Alyssa, Madeline, Camdyn, Faith

Home!



Start



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Intro to **Microplastics**



- **Microplastics are perceivably small pieces of plastic that come from:**

- Larger pieces of plastic being broken down
- Small plastic pellets being produced



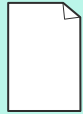
- **Everyday products are to blame for the rise of microplastics; it's all around you!**



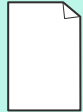
- **Microplastics affect not only our environment as a whole, but also specifically URI!**
- **They litter our waterways and beaches**
 - Being so close to Narragansett Bay, how is this truly affecting URI?



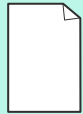
How we Plan to Tackle **Microplastics**



- By implementing a ***business model***, we ideally will help stop the spread/use of harmful plastics



- One turn of the snack dispenser = X amount of dollars



- The basis of our business model is to spread a zero-waste initiative and use rotating dispensers, instead of wasteful, single-use snack dispensers
- By replacing vending machines with these zero-waste dispensers in high traffic areas, we aim to lessen the impact of these microplastics on campus and around Narragansett Bay



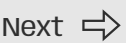
Our Zero-Waste model

- For this project, our team would like to partner with URI and implement our newly modified "zero-waste" model on campus to help prevent the spread of microplastics.
- Since mainly everything on campus is packaged with plastic, placing assorted snacks, candy, cereal, and more into our model would be beneficial in reducing microplastics.
- This model would be implemented at the library, the market, dining halls, and even the emporium!



How does it work?

- Our model is a regular dispenser that has a card swiper/money slot that accepts cash, dining dollars, ram account, and card.
- A person would be charged by each nob they turn from the dispenser. For example, if someone wanted cereal from the market,, each turn of the nob would be 10 cents.
- However, the person would have to bring their own tupperware or use a biodegradable bag.
- By utilizing our model, students would save money due to the no packaging and we would be using less plastic at the end of the day!



Our prototype!

- We will now play a little skit that depicts our prototype, describes how it's used on campus, and how it would reduce microplastics! Enjoy!



Impacts

- Our design will limit and hopefully omit microplastics on URI
- Will reduce greater issues that we have:
 - Greenhouse gases
 - Animal harm
 - Temperature
- The swipes = limit portion sizing problem
- Helps students save money
- Business approach:
 - Money from students using dispenser goes to the mart
 - Promotes our ideas more around campus *
- Everyone would use them at their convenience *
- Money/card = more accessibility *



Overall,

- We know that microplastics are bad for:
 - The environment
 - URI Campus
 - Waterways
 - Us
- What are we going to do about this impending issue?



- Our new business model will bring:
 - Reduced plastic waste around campus and the Bay -> Lesser of a contribution of microplastics by URI
 - Reduced food waste due to self-chosen portion sizes
 - Increased accessibility to lesser waste goods, leading to increased awareness of the zero-waste initiative

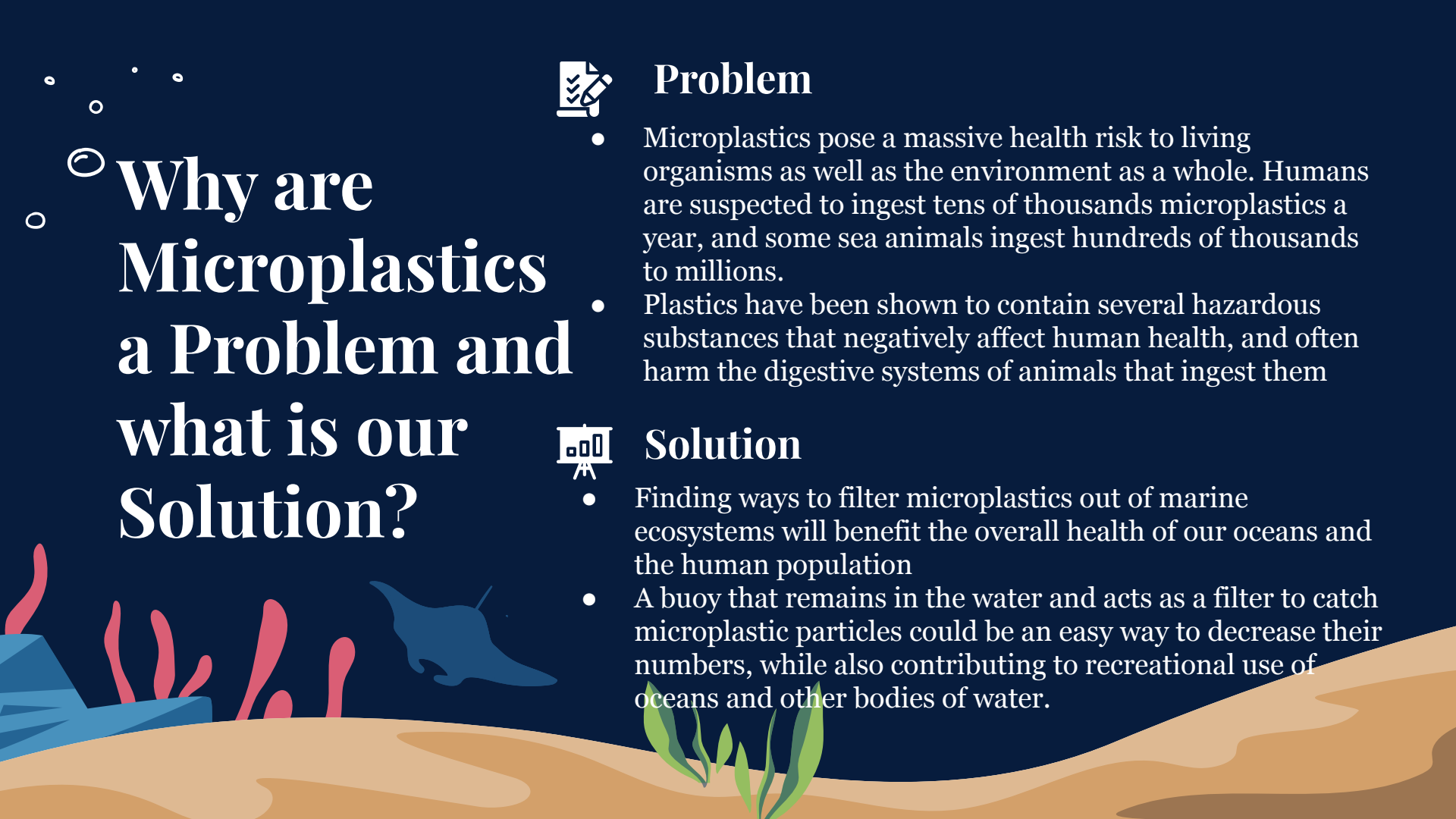


Mola Mola

Microplastic Filter

Ella Bandola, James Berkley, Catherine Fox,
Brooke Rubush, Lizzie Welch





Why are Microplastics a Problem and what is our Solution?



Problem

- Microplastics pose a massive health risk to living organisms as well as the environment as a whole. Humans are suspected to ingest tens of thousands microplastics a year, and some sea animals ingest hundreds of thousands to millions.
- Plastics have been shown to contain several hazardous substances that negatively affect human health, and often harm the digestive systems of animals that ingest them



Solution

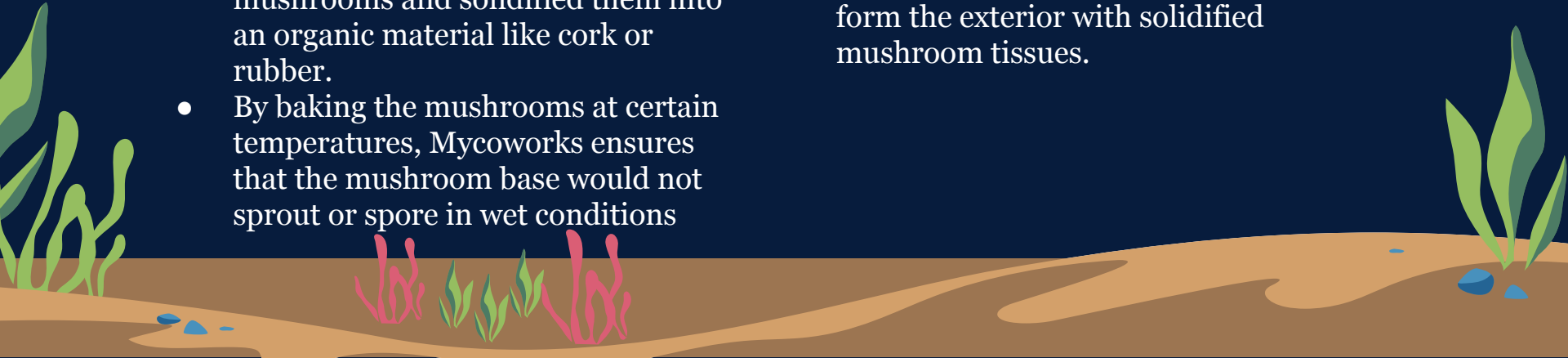
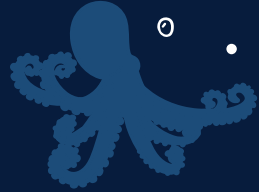
- Finding ways to filter microplastics out of marine ecosystems will benefit the overall health of our oceans and the human population
- A buoy that remains in the water and acts as a filter to catch microplastic particles could be an easy way to decrease their numbers, while also contributing to recreational use of oceans and other bodies of water.



Mycotecture Base

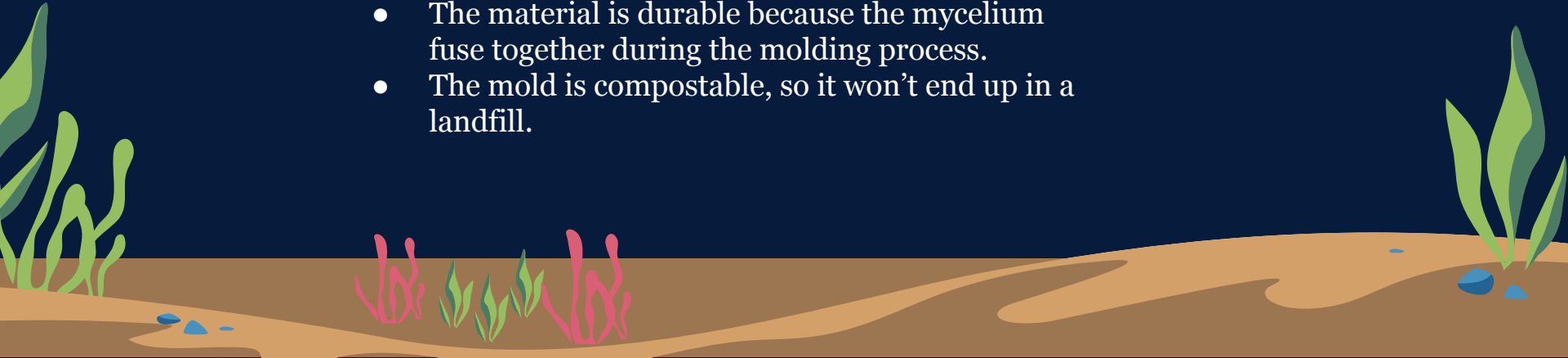


- Mycotecture is a renewable and biodegradable alternative to plastic.
- A company, known as Mycoworks, has researched and developed a plastic alternative sourced from mushrooms.
- Designers and scientists have extracted the vegetative tissues from mushrooms and solidified them into an organic material like cork or rubber.
- By baking the mushrooms at certain temperatures, Mycoworks ensures that the mushroom base would not sprout or spore in wet conditions
- Mycelium can be grown in any form of agricultural waste, which will put use to something possibly pollutive.
- Mushrooms grow together within a mold.
- These molds form natural polymers that adhere like a strong glue.
- We would create a buoy mold and form the exterior with solidified mushroom tissues.



Why is Mycotecture a Preferable Alternative to Plastic?

- Fungi is fast growing, and it is cost productive to use a singular mold for our model.
- Fungi can create a non-toxic natural sap that proves to be water resistant. Manufacturers do not have to worry about extra costs to make the model waterproof.
- The material is durable because the mycelium fuse together during the molding process.
- The mold is compostable, so it won't end up in a landfill.



Multifunction Purpose



Recreational Use

- Fisher men and Crabbers can use the buoys.
- Waterfront properties can use them.
- The materials are less expensive than typical materials



Environmental friendly

- The Fungi creates a natural non-toxic sap that is water resistant
- The sponges can catch the microplastics from the water





What is the filter made of?



Charcoal

- When water passes through charcoal microplastics become trapped in the pores of activated carbon



Synthetic Sponges

- Remove up to 90% of micro and nano plastics from water
- Plastics get caught in the sponge and can be extracted and reused

More About Sea Sponges

- They can be made of gelatin and starch or chitosan (a sugar derived from from the shells of crustaceans)
- The formula can be altered to make the sponges more or less porous
- One major con is that formaldehyde, which is highly toxic, is used to manufacture the sponges made of gelatin and starch

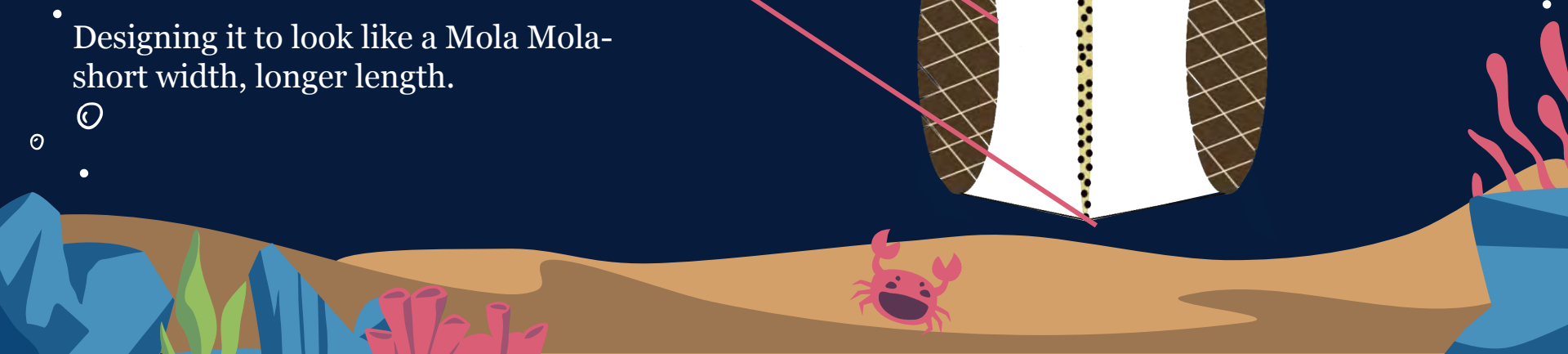
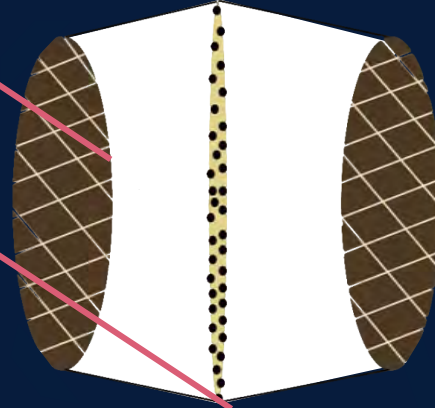
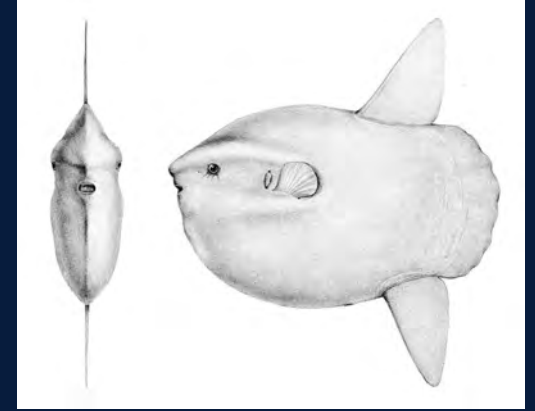


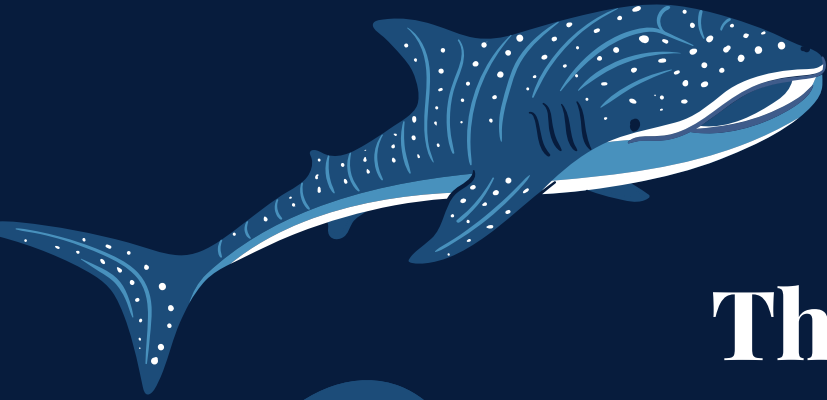
Buoy Design

Outer layer of the buoy is made of mycotecture- not putting more plastic into the ocean.

Charcoal sheet and dead or synthetic sponge in the middle to filter the microplastics.

Designing it to look like a Mola Mola- short width, longer length.






**Thank you,
any questions?**





Citations!

- [Scientists Have Created Synthetic Sponges That Soak Up Microplastics | Innovation | Smithsonian Magazine](#)
 - [Ocean sponges have incredible filtering power](#)
 - [An ultra-light sustainable sponge for elimination of microplastics and nanoplastics](#)
 - [Myco Works Website](#)
 - [The natural products that could replace plastic](#)
 - [YUNA YUDESIGN UPV](#)
- 



PROVIDENCE CHAIN RESTAURANT SUSTAINABILITY PLAN

Savannah G, Mikalah F, Hillary W,
Alexia G

Group 5

Problem

Several chain restaurants in Providence RI, contribute to the micro-plastic waste in Narraganset Bay.



Micro plastic affects a lot of issues like human health, marine life, and our ecosystem.

Researchers at URI estimate that the top two inches of the Bay floor contain more than 1,000 tons of micro plastics.

SOLUTION

Together we have come up with a business model that involves creating an app with reward incentives, psychically changing plastic products to environmentally safe products, and creating flyers/social media to raise awareness and help make Narraganset Bay more clean.



Products

1 - PLASTIC STRAWS

Plastic straws can be turned into compostable paper straws that are safer and better for the sea life. People can also bring their own reusable straws

2 - PLASTIC FORKS

Plastic utensils can be turned into plant based compostable utensils or customers are given the opportunity to bring their own reusable utensils.

3 - CONTAINERS/BAGS

Instead of plastic bags/ containers, the restaurants will switch to compostable paper bags and containers.

4 - CUPS

Restaurants can give out compostable paper cups or customers can use their own reusable cups/ bottles.

5 - BINS FOR PAPER WASTE

Specific bins can be in every fast food restaurants and around the city for compostable paper products.

INCENTIVE APP



- will list fast food restaurants participating in this program
- customers can earn points when bringing in their own utensils/straws/etc.
- customers can earn points by following Narragansett micro-plastic awareness Instagram/Facebook account
- app includes links to purchase personal reusable products and purchases award points
- these points will go towards payment of future meals at the fast-food facilities participating in the program



INCENTIVE APP PROTOTYPE

Restaurants:



eligible to earn and use points

all utensils and packaging are
eco-friendly



Wendy's

eligible to earn and use points

all utensils and packaging are
eco-friendly



eligible to earn and use points

all utensils and packaging are
eco-friendly



eligible to earn and use points

all utensils and packaging are
eco-friendly

Your total points:

RAISING AWARENESS

To help raise awareness to all age groups we have decided to...

- Create flyers to post inside and outside of the local chain restaurants to educate costumers on micro-plastics**
- Create an Instagram/Facebook account to help raise awareness about micro-plastics in Narragansett**

SUMMARY

In conclusion, building an app where collecting points in chain restaurants that participate in being eco-friendly can be appealing. This will motivate people to bring their own reusable utensils while also winning prizes from point worthy actions listed on the app. While also advertising the app and information about the affects of micro plastics on chain restaurants. By creating posters to put on the restaurants that support our cause.



SOURCES

<https://thesugarcanestraw.com/biodegradable-vs-compostable-straws-whats-the-difference/#:~:text=Compostable%20straws%20are%20made%20from,and%20carbon%20dioxide%20over%20time.>

<https://www.providencejournal.com/story/news/environment/2023/09/02/narragansett-bay-floor-holds-tons-of-microplastics-uri-study-finds/70736783007/#:~:text=Lots%20of%20it,the%20last%20decade%20or%20two.>

Rhode Island Blue Business Bill

Rachael Pietrantozzi, John Moran, Maggie Mulleruy, Sarah Crehan, Brooke O'Donnell



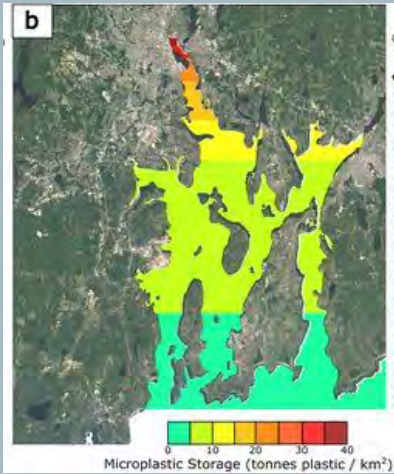
Thought Process Through “How Might We” Questions

How might we incorporate more eco-friendly materials in the business world?

How might we reduce the use of microplastics in order to help the environment?

How might we bring awareness to the community in order to reduce the abuse of single use plastic?

Finally led us to... How might we change business practices in order to lessen the amount of plastic that ends up in Narragansett Bay?



The concentrations of Microplastics throughout the bay increase as it gets closer to more urban and densely populated areas proving the need for human intervention to combat this problem

Right now there is very little rules and regulations for plastic use and disposal so it leads to a lot of pollution build up in our oceans and bays. Our model looks to fix this

The Microplastics problem





In recent studies of the Narragansett Bay has been discovered that the top 2 inches of the bay floor were found to contain more than 1,000 tons of microplastics.

Microplastics (of this volume especially) have extremely harmful to the environment and the marine life that live in the Narragansett bay. This pollution also comes back and harms humans through the food we consume and the environment we live in.

The Microplastics problem



Rhode Island Blue Business Bill

Plastic Quota

- Single use plastic quota based on size of business and industrial niche
- Mass plastic in and out
- Compliance will get 3% back on sales tax produced *difference system for clothes and groceries



Business Education

- 2024 will launch the statewide education conference.
- Locations Narragansett, Newport, Warwick, Providence, Pawtucket
- Conference held every 4 years
- Attendance will lower business property tax by 5% for 2 years



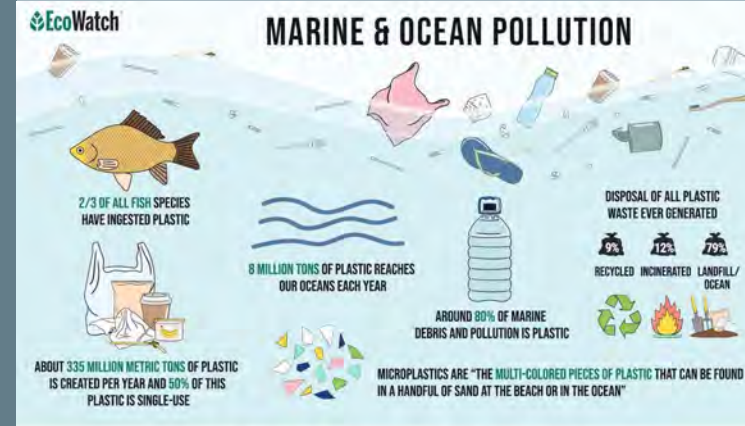
Public Education

- Impacts of plastics will be emphasis in public school curriculum 8-12
- Focus on bay area impacts, blue economy
- Higher education research funding provided by the state 3 (15-\$20,000 grants)

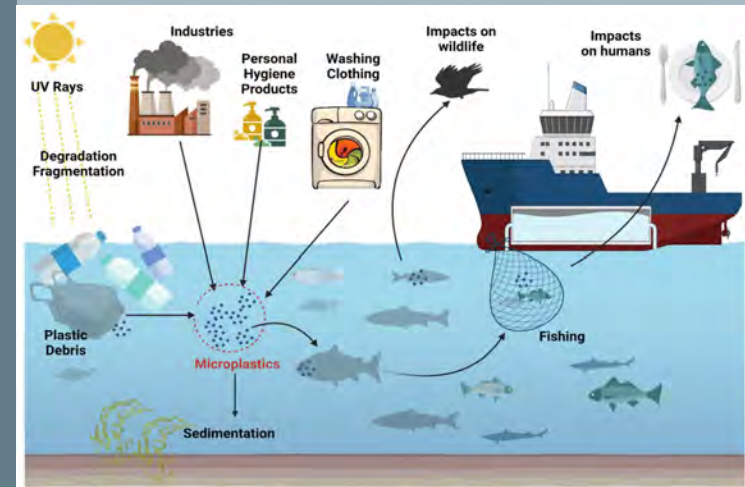


Impacts of The Rhode Island Blue Business Bill

- Bring awareness to the public on the negative effects single use plastic has on our environment and how much microplastic pollutants end up in Narragansett Bay
- Make the business community aware of the damage of environmental microplastics and aid in helping them create a less plastic dependent business
- Create a system that lowers the number of plastics that enters the bay biosphere



Source: <https://www.ecowatch.com/ocean-plastic-guide-2653277768.html>





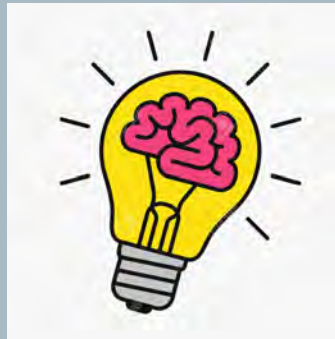
Businesses must stay under a target amount in terms of using single-use plastics



Compliance with quota will get 3% back on sales tax produced



Decrease in amount of single-use plastics being used, therefore decrease in amount entering bay



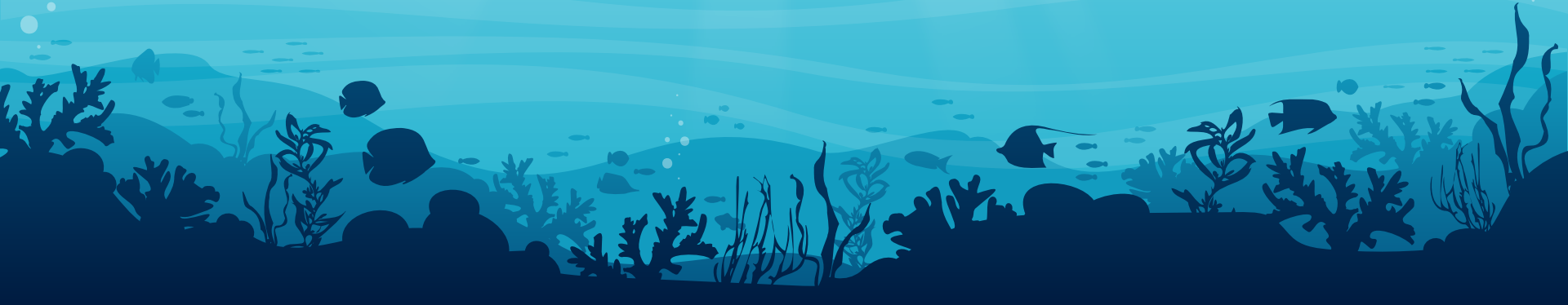
Increased awareness of how much plastic they are using



Businesses have an incentive to limit single-use plastic use

Microplastics & the Narragansett Bay

Evelynne Lepe, Shirley Chen, Penelope Pino, Meryl Brousseau, Emily Melgar



What is the problem?

MICROPLASTICS!!!

Microplastics are fragments of any type of plastic less than 5 mm in length.

Microplastics are of concern because of their widespread presence in the oceans and the potential physical and toxicological risks they pose to organisms. Microplastics can be ingested by a wide range of animals. Microplastics can also be ingested by animals and then rise through food webs, leading to dangerous compounds.

Microplastics can act as a medium for environmental toxic substances, which are absorbed into the body and cause various diseases such as weight gain, insulin resistance, decreased reproductive health, cancer, and more.

There is about 1000 tons of this in Narragansett Bay

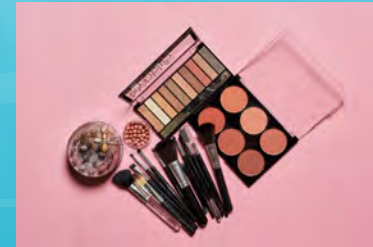


Evelyn

Everyday Microplastic Examples

Microplastics are commonly found in:

- ★ Bottled water
- ★ Tea bags
- ★ Beer
- ★ Rain
- ★ Atmospheric air
- ★ Ashore sea breeze
- ★ Human feces
- ★ Makeup products/toiletries
- ★ **Clothing**



4 Our Plan

It's nearly impossible to solve all the microplastic contribution problems in Narragansett Bay in one swing without proper knowledge and the time to execute the plan. Therefore, we are focusing on the microplastic contribution from clothing. First, however, we need to better understand what exactly is happening...

Where do the microplastics in clothing come from?

Microfibres are a type of microplastic released when we wash synthetic clothing – clothing made from plastic such as polyester and acrylic. These fibres detach from our clothes during washing and go into the wastewater.

How do the microplastics from clothing get into the Bay?

The particles come from synthetic fibers in clothing, like fleece jackets that shed in washing machines or baby wipes flushed down toilets, and then wash down sewer pipes, pass through treatment plant filters and empty into bay waters. washing machines don't have filters to catch them, all these small plastic particles end up in wastewater and travel down the drain.

What is our idea?

Our idea is to spread awareness and support the topic of how microplastics affect the environment around us through clothing, by visual representation.



HMW Questions Brainstorming

- 🐟 How might we increase awareness on the microplastic contribution issues (specifically from clothing) in the Narragansett Bay?
- 🐟 How might we advocate for the usage of more sustainable/eco-friendly wear in order to decrease the microplastic contribution specifically from synthetic fibers?
- 🐟 How might we create and promote the use of filters in washer and dryers for college campuses in order to reduce the amount of microplastics produced by students' laundry?
- 🐟 **How might we use visual aids to promote better washing practices on college campuses in order to reduce the amount of microplastics produced by students' laundry?**

HMW Question Ideas

How might we use visual aids to promote better washing practices on college campuses in order to reduce the amount of microplastics produced by students' laundry?



Infographics/posters on better washing practices in URI's laundry rooms



Create graphics on microplastics as a result of poor laundry practices for social media

Our solution track

We went with the third option, which is to use data/visualizations to creatively illustrate the scope of the problem in an impactful way.

Solution/Product

Our plan

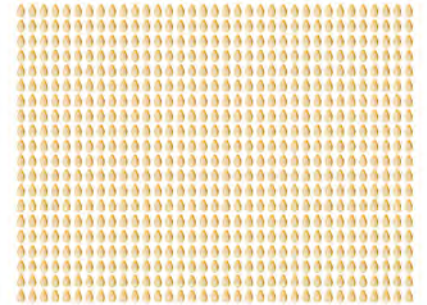
Our plan to help the issue of microplastics is to spread more awareness of the subject. We plan on spreading the awareness by posting visual aids on microplastics. We plan to post flyers in the washing rooms of URI.

Predicted outcome

Our predicted outcome, supported by our plan, is to spread awareness to students who use the washing machines on the URI campus, and hopefully generate less microplastics.

THIS IS 700

SESAME SEEDS



EACH LOAD OF LAUNDRY
PRODUCES UP TO

700,000

MICROPLASTIC FIBERS.

LEARN HOW YOU CAN HELP.



Our visualization
used to spread
the word

IT'S ALL ABOUT THE Microplastics

Microplastics are of concern because of their widespread presence in the oceans and the potential physical and toxicological risks they pose to organisms. They are found in many everyday items including laundry containing synthetic fibers. The laundry we do here on URI's campus contributes to the widespread microplastics problem. Here is how to help:

Weight of microplastics in Narragansett bay is equivalent to...



142 African Elephants

THIS IS 700
WASH LOADS



EACH LOAD OF LAUNDRY
PRODUCES UP TO
700,000
MICROPLASTIC FIBERS.
SOURCE: WASH YOUR WAY

PRODUCT:

Visual aid that brings attention to microplastics produced by laundry with a QR code to better washing practices in URI's laundry rooms



About 18-35% of microplastics are released to oceans are from synthetic textiles globally.

Weight that microplastics from laundry contributes is equivalent to...

52 African Elephants



This is the estimated number of fibers released when laundering a wash load of 13lbs.



URI relations to microplastics

The URI Plastics initiative is a dynamic research network based on helping inform society, to reduce land-to-sea plastics pollutants



Better Ways to Wash:

1. Do laundry less, with fuller loads
2. Try plastic-free fabrics
3. Explore natural detergent options!



Any Questions?

The background is a light blue gradient with several bright, white sunbeams radiating from the top center. The bottom of the image features a dark blue silhouette of an underwater reef with various coral and sea anemone shapes. Several dark blue fish are scattered throughout the scene, swimming in different directions. Small white bubbles are visible on the left and right sides of the image.

Thank you for your time!

