Link to past mqp paper:

What is the format of an MQP report?

Your report will have two parts. The first is the Proposal, where the problem is identified and put into context using background material. The second is the Methods and Results, where you describe what you did, what the results were, and how you are interpreting them.

Part I – Proposal The Proposal chapters introduce the reader to the problem that your project is trying to address. Therefore, these chapters should present background material that helps the reader to understand the context of your project aim. Usually, providing a context entails summarizing previous published research. This context may also be supplemented by summarizing preliminary work performed by previous MQP groups or their recommendations. The purpose of background material is to convince the reader that your ideas are sound and that the work you are proposing has a good chance of succeeding.

Part II – Methods and Results This part gives the reader the details of what you did and what the results were. In addition, this part includes chapters that discuss the results (Analysis and Discussion chapter) and a big-picture summary of their significance (Conclusions chapter). Although the second part of the MQP report resembles a journal article, it contains more information than is usually presented in such an article. This additional information shows the reader the steps you took along the way to your final result. For example, in your report you will have a chapter covering the design of your experiment or device. There you will need to describe your initial through final designs and what criteria you used to decide on specifications or changes. By contrast, professional journal articles report only final designs and results.

Audience Before you begin your report you should have a clear idea of your intended audience, which will determine the level of detail present in the report and the amount of background material that is presented. In the case of the MQP report, you are writing for other students who may be continuing the project or people outside of the field who may know something of what you are doing, but who are not experts. Your document should therefore contain more background information than you would include normally in a journal article. (Note that including this background material helps to demonstrate mastery of the subject.) Summary In summary, the goal of your MQP report is to document thoroughly your MQP from problem conception to final result.

<u>Outline for Paper</u>

Cover page

(Maybe Abstract and Executive Summary)

Table of Contents

Introduction (tell the problem and audience)

Background (what the past MQP was about and history of problem)

Methods (Brainstorm, Design, CAD, Materials Chosen, Prototyping, Testing)

Results (Analysis and Discussion) (Final Thoughts on Design and Changes throughput)

Recommendations (on how to perfect the design, what we learned through testing, possibly what other MQP teams should do in the future)

Conclusion

References

Appendices

Introduction:
-Water pollution being an issue (problem we were presented with)
-our plans to help with it

Water pollution is a prevalent issue around the world. Trash, plastics, and chemicals are all sources that feed into this problem. The specific issue that our team is focusing on is trash built up on the shoreline. On the shoreline, trash can collect up on rocks and sands creating islands of trash and plastic. Our project goal is to try and help improve this situation by creating a device to help remove the built up trash and debris on the shoreline of the ocean. In doing so we wish to help make the shorelines cleaner for both the animals and humans who need that water to live.

However, with new technology development as time has gone on, advances in ocean cleaning devices have also improved. Now there are machines that can work completely autonomously to help and clean the oceans. But, they have not been perfected yet as this is still a newer concept. Also, most of those machines are created to help clean the ocean water. For this project we are focused on the build up of trash on the shoreline, this issue is a bit different than just ocean water cleanup. Being more of specific issue, there are less mechanisms/machines out there to help prevent this build up on the shorelines. A specific task we want to help with is where the trash builds up on rocky shorelines of oceans. In our research we saw multiple photos and maps of where trash builds up in the ocean and a good majority of it was collected in areas with rocky shorelines. There are some machines out there that help remove trash from sandy shorelines, but in our research we did not find many that can help get the trash out from the rocks. From this research we decided that we wanted to create a device that could help with this task. In doing so, we aim to try and help clean the oceans, beaches, and shorelines.

Background
-Water pollution background
-environments where this is happening and why
-background on other devices (including other mqp)
-maybe material choice (y good and bad)

Water pollution occurs all over the world. However, this specific pollution type (trash collecting on shorelines) that we are focussing on, is usually more concentrated in certain areas of the world. For instance, ..

In the past, some devices were invented to try and reduce the amount of built up debris on shorelines for these areas. Some of those devices include: ….
As technology has improved, so have these devices. However, most of the devices purposes are to clean the water of the ocean or specifically the beaches, we want to create a device that will help get the trash and debris off the rocks on the shoreline of the ocean. In our research

Under Background Section:
Examples of where this is happening:

Hawaii
https://www.nist.gov/blogs/taking-measure/plastic-washes-hawaiis-beaches-affects-me-personally

https://pubs.acs.org/doi/10.1021/es5060572

the shore of Doctor Creek in the Wouri Estuary, Cameroon

Quote: "(This) is probably the most important river in the world when it comes to plastic pollution," Slat said, with the river currently contributing to about 2% of the world's total plastic emissions to oceans, according to his organization. - This is in Guatemala

https://www.reuters.com/business/environment/cleanup-crews-trap-plastic-guatemalan-river-protect-ocean-2022-06-09/

Conservation efforts:
- https://oceanconservancy.org/trash-free-seas/international-coastal-cleanup/
- https://www.marinebio.org/conservation/ocean-dumping/beach-cleanups/#:~:text=Local%20Community%20Cleanups%3A%20Many%20beach,beaches%20they%20love%20and%20protect.
- https://www.epa.gov/trash-free-waters/learn-about-aquatic-trash

Water issues:
- https://www.sciencedirect.com/science/article/pii/S0025326X2400033X
- https://19january2021snapshot.epa.gov/trash-free-waters/impacts-mismanaged-trash_.html#:~:text=As%20debris%20accumulates%2C%20habitat%20structure,habitats%20to%20support%20aquatic%20life.

Devices/efforts being used to help:
- https://www.hbarber.com/beach-cleaning-machines/#:~:text=The%20Barber%20SURF%20RAKE%20is,cleaning%20medium%20to%20large%20beaches.
- https://www.itopf.org/knowledge-resources/documents-guides/response-techniques/shoreline-clean-up-and-response/
- https://www.theguardian.com/environment/2019/oct/03/ocean-cleanup-device-successfully-collects-plastic-for-first-time
- https://www.youtube.com/watch?v=nII28HBeAg8&ab_channel=MachineCity

Methods
-design process
When creating this design we used CAD (Computer Aided Design).
-original design and the evolution to current one
Started off with a design that was going to help clean beaches and the sand specifically. It then evolved to a design that would help clean the rocky shorelines of the ocean.
-why certain things on the design were added, taken away, or changed

-what materials were chosen and why

Results
-what was actually made (also bought, and put together)
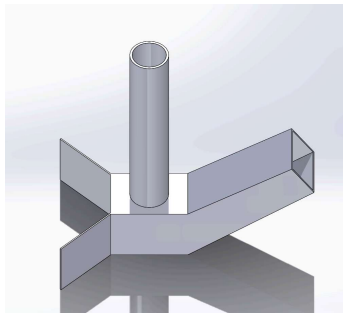
-challenges

-if something was changed (why)

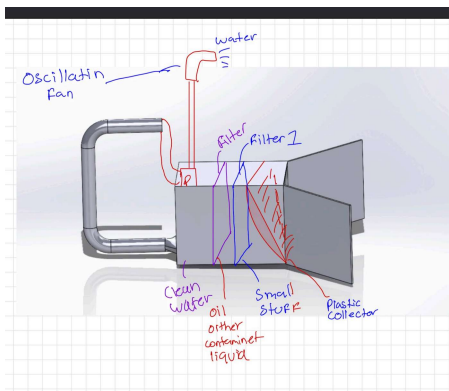-if something did not (why)

Conclusion
-overall our end product and what its function is
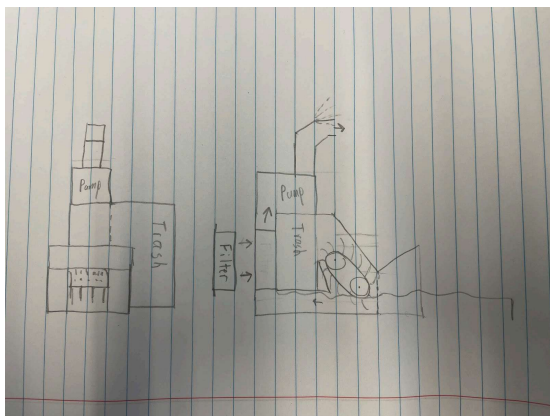-how it will help be a solution to the original problem
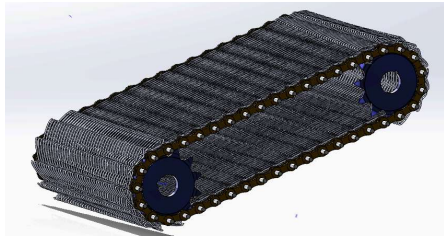

Photos to include:
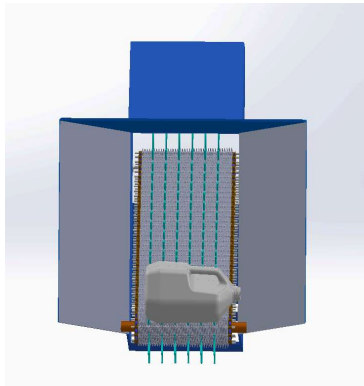
Original start to CAD:

More Detailed Design CAD:
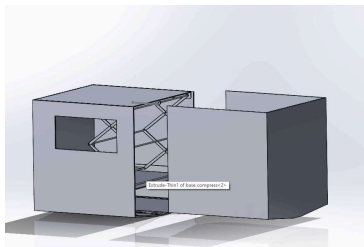

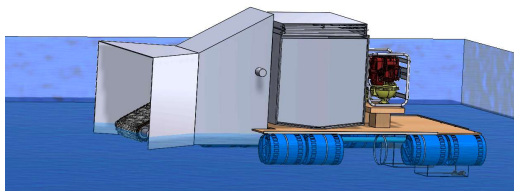Sketch of our Plan:

Conveyor Chain Assembly:
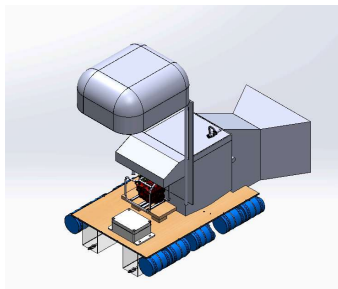

Intake full assembly:

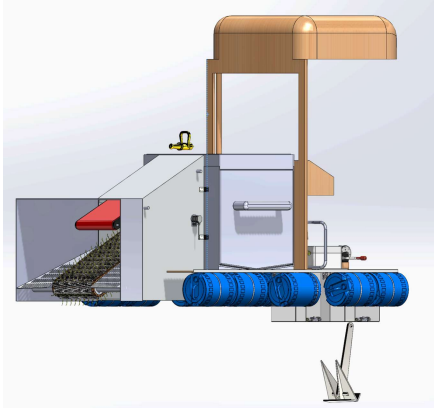Final Container and Compression mechanism:

Design without the operators cabin:

Design with operators cabin:

Design including the anchor:

Animation of trash going into the conveyor system: