



Ms. Pamela Wilczynski, STEAM/QUEST Teacher
5th Grade QUEST students

Challenge Requirements

- ❖ Identify and solve a real world problem or situation which needs resolution
- ❖ Modify an existing product
- ❖ Invent something which does not exist
- ❖ Must incorporate an environmental impact and sustainability



The Engineering Design Process



First Steps - October -

December

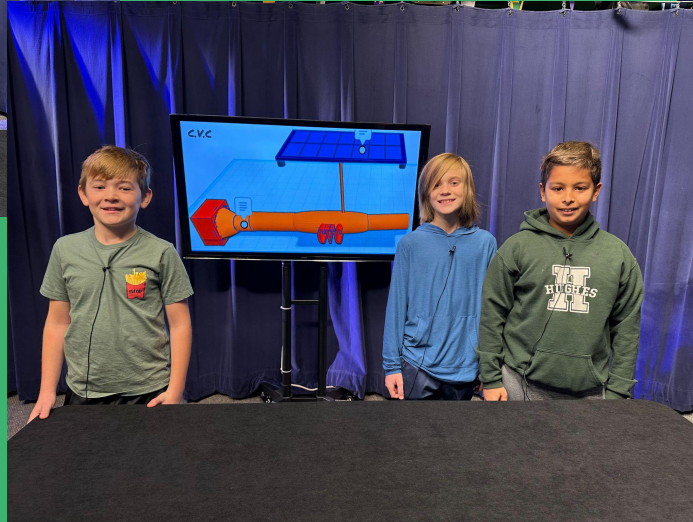
- ❖ Brainstorm / Research Ideas
- ❖ Form groups
- ❖ Develop outline
- ❖ Design 3D model on computer
- ❖ Create 2 minute Pitch Video to explain idea
- ❖ Film Pitch Video with Mr. Voorhees and GL students



Our Ideas



Self - Planter



CVC & Co



Paintcore

Our Ideas



The Changer



The EYE Guide



HydroBuddy

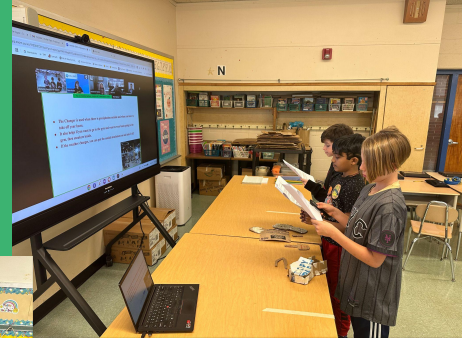
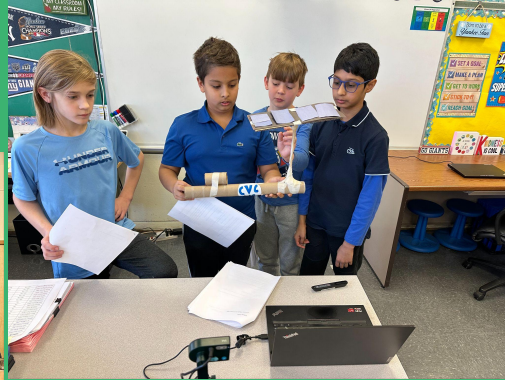
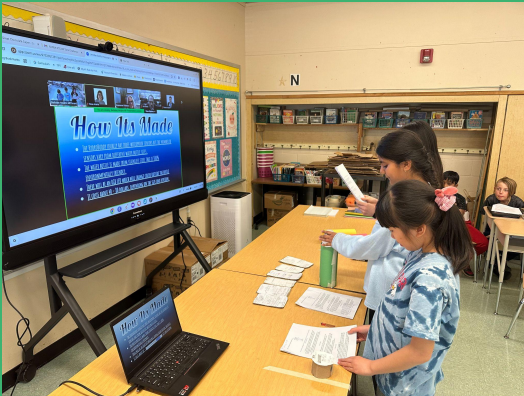
Next Steps - January - March

- ❖ Continue to research idea
- ❖ Design prototype
- ❖ Create a 5 minute presentation for a panel of STEAM Tank judges
- ❖ After presentation, answer questions from the judges
- ❖ Practice Round with Guest Judges to prepare



Regional Round

- ❖ The STEAM Tank judges include: teachers, business and industry leaders, entrepreneurs, U.S. Army engineers, university staff / leaders, and staff from education-focused non-profit organizations



Breakdown of Challenge

- ❖ 620 teams in NJ applied for the STEAM Tank Challenge in grades K - 12
- ❖ 335 teams advanced to the Regional Round
- ❖ Out of those 335 teams, 131 were elementary teams
- ❖ From the 131 elementary teams, 20 teams advanced to the Final Round



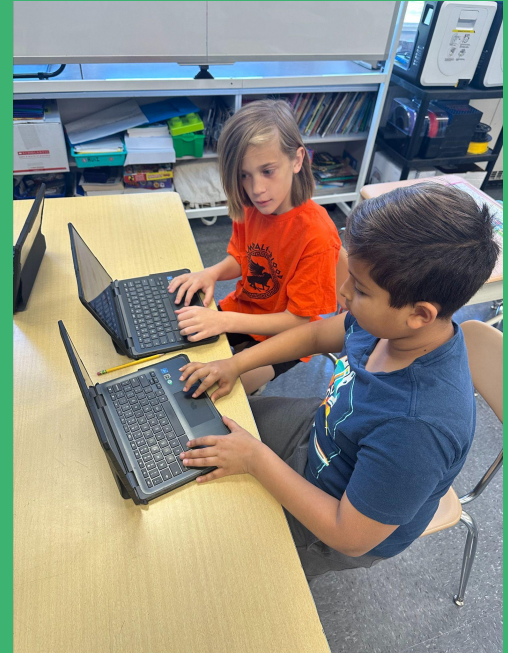
Final Round

- ❖ Design a “working” prototype for proof of concept
- ❖ Meet with subject matter experts for research
- ❖ Create a 5 minute presentation for a panel of STEAM Tank judges
- ❖ After presentation, answer questions from the judges
- ❖ Highlight what the team has been working on since the Regional Round



Final Round

- ❖ May 20th - in the morning
- ❖ The top 3 teams will be announced in June
- ❖ These teams will present at the NJSBA conference in Atlantic City in October



eve and co. Presents...



By: Dhruv, Cameron,
Cooper, and Vyom

THE ECO-WAVE



Why we made CVC and Co

Cameron: I have always loved animals. I want to be a zookeeper when I grow up. I want to protect animals any way I can.

Cooper: My dad never will let me go on cruises which really bums me out since they are so fun.

Dhruv: I love sea animals and I want to protect them.



Vyom: I was a huge fan of marine wildlife since I was able to talk, I have always thought that it would be cool to keep animals safe.

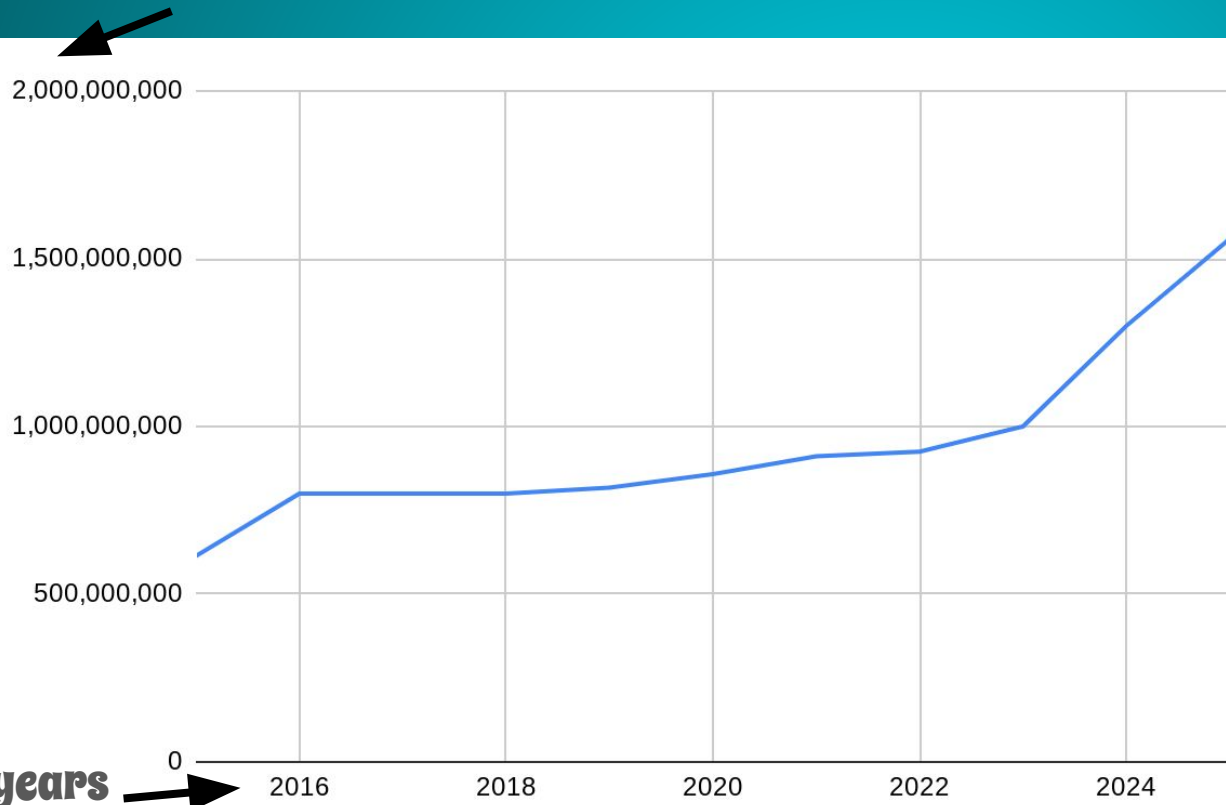
Why current boat engines are

BAD

- Boat engines directly discharge unburned fuel and oil into the oceans.
- In shallow waters, a spin of a propeller churns sediment which creates turbidity (cloudy water) which blocks sunlight from reaching aquatic plants.
- In shallow waters and in deep, the boat propeller could hit and hurt fish.
- Causes nitrogen (N) and oxygen (O) to bond creating nitrogen oxides (NO_x) and NO_x is a primary ingredient in smog, ground-level ozone, and acid rain.

Statistics

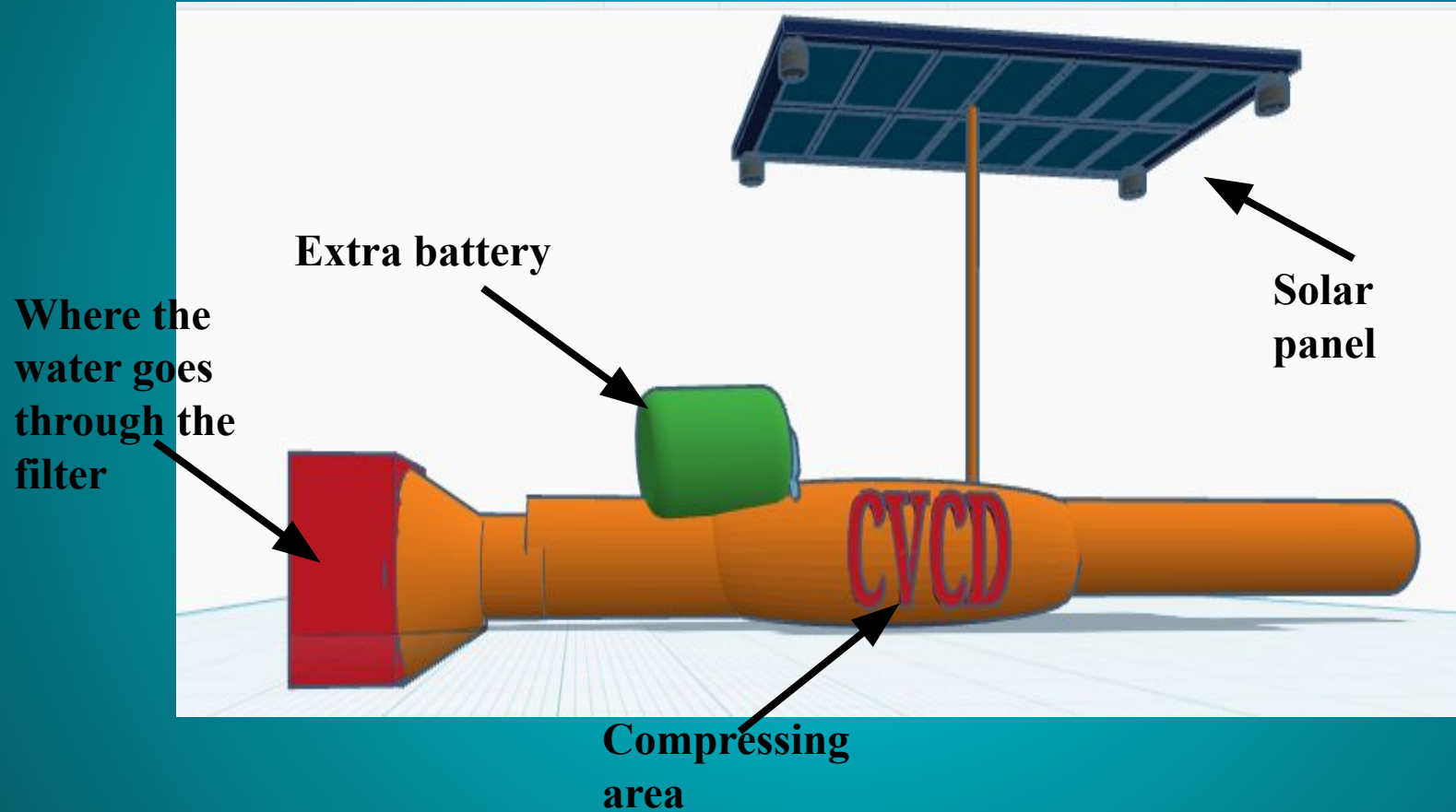
Gallons



This chart represents how many gallons of Co2 was dumped by boats in the ocean every year.



Our Model



Prices I

- **Polyethylene-LyondellBasell, Edison, NJ**
\$0.41-\$0.55 per pound
- **Aluminum- Wrisco Industries Inc, Edison, NJ**
\$0.70-\$2.20 4'x10' sheet
- **Steel-Atlas Refinery Inc, Newark, NJ**
\$1 - \$3 per Lb
- **Copper - Paige Electric Company, Mountainside, NJ**
\$120-\$140 500 ft
- **Bamboo - Paige Electric Company, Mountainside, NJ**
\$18-\$35
- **Solar panel and inverters**
\$550-\$770

Prices II

- **Vacuum Pump - Bernardsville Hardware, Bernardsville, NJ**
\$10,000
- **30 KW Battery - The Home Depot, Watchung, NJ**
\$10,000
- **Beeswax - Neshanic Station Apiaries, Flemington, NJ**
\$170

Experts

- **Mr. Healey - is the COO of Versa Valves**
 - **He told us how to stop the fish from getting into the motor.**
 - **He also told us that our boat motor was similar to a jet ski.**
 - **He helped us with figuring out which type of metals would not corrode in salt water and sea water.**
-
- **We figured out that bio-based industrial coating stops metal corroding.**

Proof of Concept

- Jet skis use a similar concept, they use an impeller to propel the ski forward.
- We have been working on a model to help our proof of concept.
- We have a small pump that even under water it propels the boat forward.
- It takes water from below the boat and shoots it out the back.
- It runs on solar power using solar panels.
- We are using beeswax to prevent corrosion because it is biodegradable and renewable.

thank

you



The background of the image is a dense field of white, three-dimensional question marks. These question marks are scattered across a vibrant blue surface, creating a textured, almost tactile effect. The lighting is bright, casting soft shadows from the question marks onto the blue background, which emphasizes their 3D nature. In the center of the image, there is a solid blue rectangular box. Inside this box, the word "Questions?" is written in a white, bold, and slightly distressed or hand-painted font. The overall composition is visually striking due to the high contrast between the white, blue, and the textured background.

Questions?