Temperature Controlling Mug

Aiden Lee, Francisco Martinez-Deviz, Aurelio Paltera, Azen Bendersky

Problem Statement

Drinking liquid, like coffee or tea, shouldn't be an uncomfortable experience, yet oftentimes it is. The drink can either be too cold or too hot and it forces whoever is drinking it to wait for the liquid to naturally fall to a comfortable temperature. In the fast paced world of today, waiting for little things like this can become a nuisance. Almost everyone in the world is affected by this problem, and we'd like to create a solution that is both easy to use, and affordable for the masses.

Similar Designs

Fig 1: Bestinnkits Smart Gravity Induction Mug Warmer:

Pros:
- Cheap
- Heats
- Can be used with multiple mugs

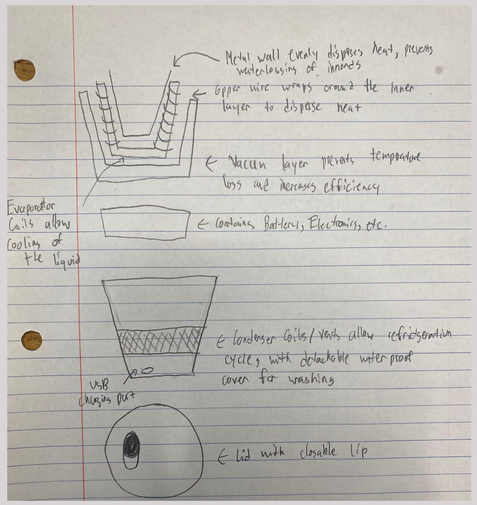
Cons:
- Doesn't cool
- Can't be held during use

Fig 2: Geezo Smart Temperature Travel Mug:

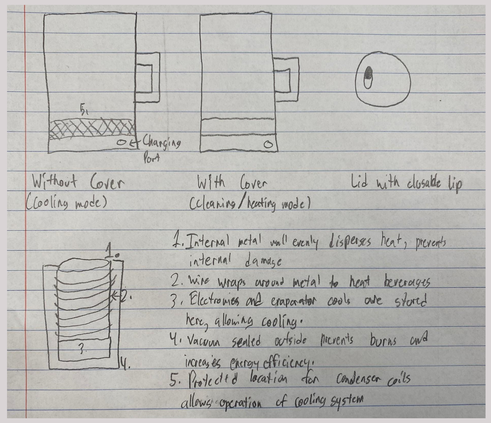
Pros:
- Cheap
- Displays Temperature
- Heats

Cons:
- Can't cool
- Needs to be plugged in
- Can only be used in a car

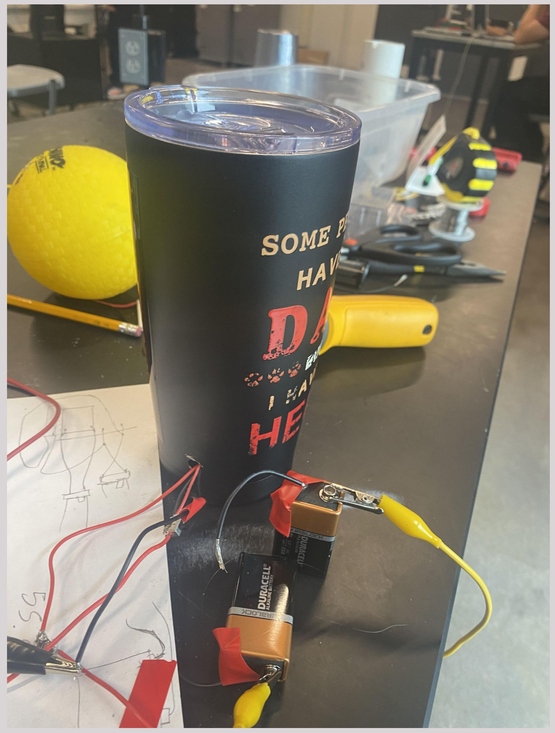
Initial Design Concept

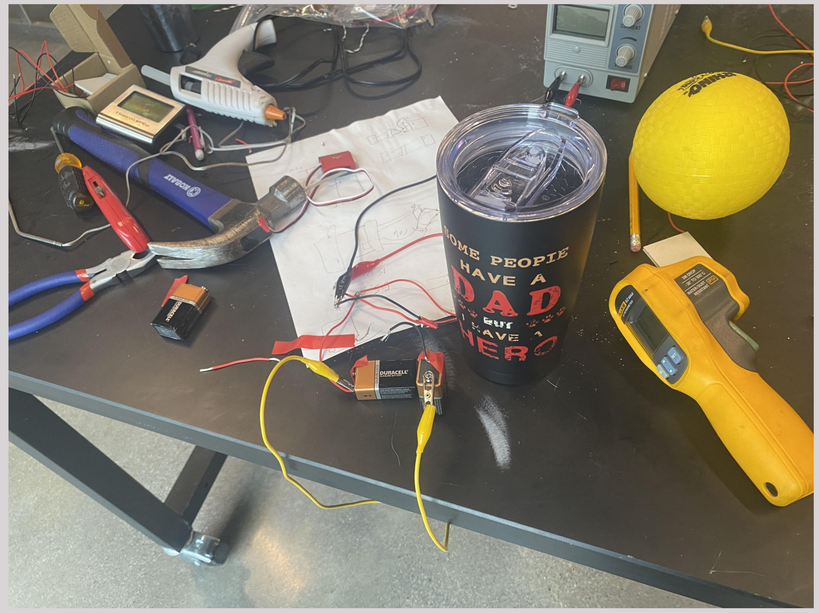


Revised Design Concept



Final Product





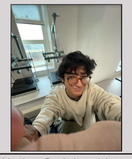
Our Team Members

Aiden went to Lincoln Middle School and discovered his love for engineering through the Botball club, which he attended for three years, and returned to coach during his 11th grade summer. Aiden loves problem solving, video games, and violin.

Fig 3: Aiden Lee

Azi Bendersky is from Santa Monica, California where he has lived his whole life. He goes to school at Santa Monica High School as a Senior. His planned majors in college are environmental sciences and agriculture engineering, and he plans to stay in state for university.

Fig 4: Azi Bendersky



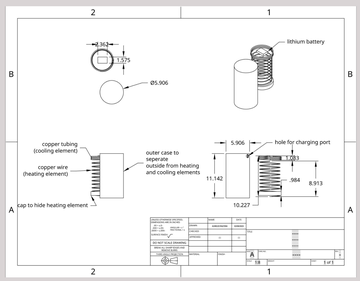
Francisco Martinez Devis is a visionary, an artist, a genius. As someone who sees the intricacies of engineering, he inspires masterful creations. Some of his creations include a GPS and a barometer during distance learning, and he is currently working on many other engineering projects. A virtuoso of science and math, he prefers to be addressed as your majesty. Not only does he bring hope to the future of engineering, but he brings honor, musicianship and prestige to his school.

Fig 5: Francisco Martinez Deviz

Fig 6: Aurelio Paltera

Aurelio Paltera was born and raised in Santa Monica, going to school in the Santa Monica public education system for his whole life. Throughout his school journey Aurelio was fascinated with anything STEM and his intended major is aerospace engineering. He has remained in the engineering pathway since middle school and for his time at Santa Monica High School and has remained passionate about aerospace engineering.

Prototype Model/Cost Analysis

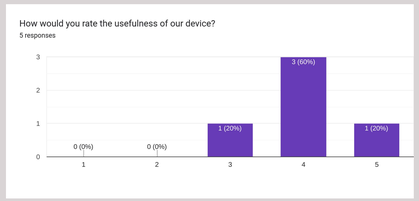


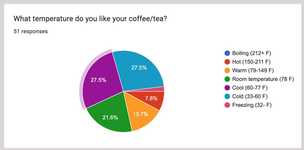
CAD DESIGN

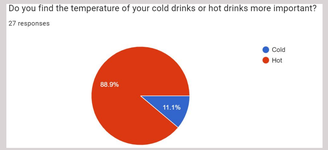
	Cost Per Unit	Number of Units Used	Total Cost
Inner Shell	14.39 for a 6 pack	1	2.40
Heating Peltier Mod.	16.99 for a 5 pack	1	3.40
Cooling Peltier Mod.	19.99 for a 5 pack	1	4.00
Exterior Shell	21.99	1	19.99
Thermal Glue	11.99 for 10 grams	1	1.20
Estimated Labor	15.50	2 hrs	31
Total:			63.99

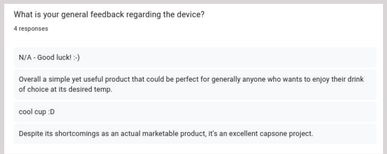
Cost Analysis

Survey Results









Testing Results

	Max Heat w/o	Max Heat w/	Max Cool w/	Max Cool w/o
1	93	90	60	58
2	115	84	62	55
3	125	96	61	56