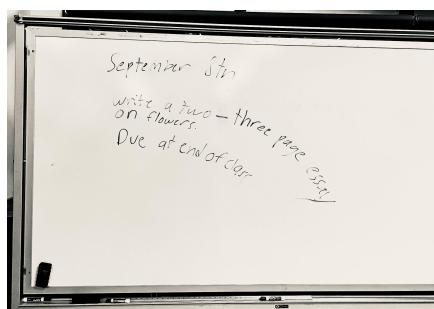


Problem:

Messy, hard-to-read whiteboards. Why is this a problem?

Kids with ADHD, Dyslexia, or poor eyesight struggle to understand what's being written on the board in the classroom. They need to be able to read the board clearly so they can retain the information better. That also goes for people in the business world, who struggle reading the board during business meetings.

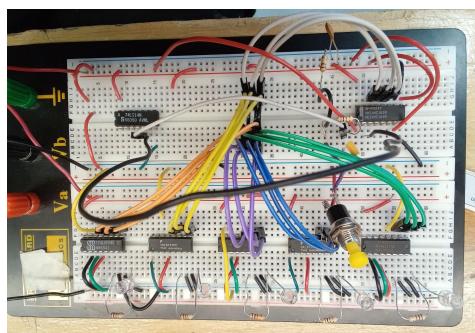
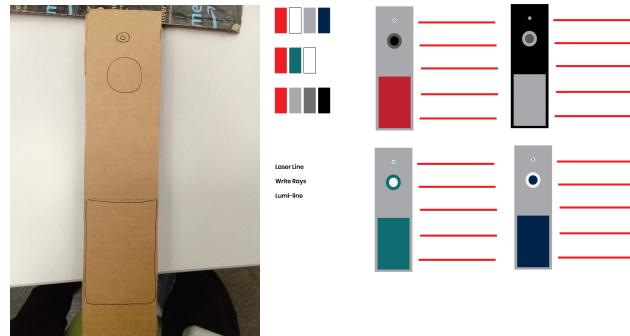


Idea:

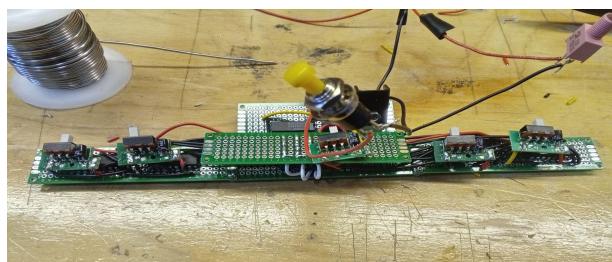
At the beginning of this class, Keith took us on an idea walk. He pointed to a whiteboard and asked "How can we make this better?". So I came up with the solution. Writing consistently straight lines on a whiteboard is something everyone wants, but not everyone can achieve. I wanted to create a device that would project lines onto the surface, have different line spacing options, would stick to any type of board, and also be small enough to fit in a backpack.

Design:

The first design was 12" long x 4" wide with a pocket on the front for dry erase markers. The laser line spacing options were 10" apart, 5" apart, or 2.5" apart. There were four different color palettes Holly came up with, along with three name ideas for the product - Laser Line, Write Rays, and Lumi-line.



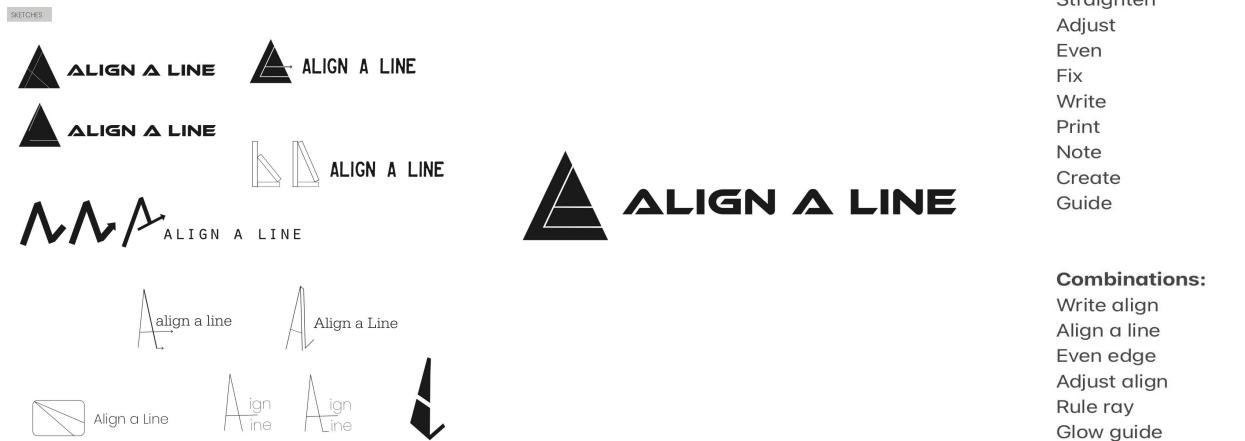
Chase worked on the electronics board for the device. He wired each electrical signal by hand. There was difficulty with the power source, what kind of signal each wire was getting or not getting, and programming the switch properly. It took many hours, many google searches, and lots of patience to assemble it properly.



But after many weeks of trial and error, Chase created a beautifully working electronic system that works so smoothly! This picture is the final working system.

Holly came up with many different product name options (see list on right). We narrowed them down to Align a Line, Glow Guide, and Highliner.

Once we solidified the product name to Align a Line, Holly worked on some logo options for our product. After realizing the logo needs to be bulky enough to be 3D printed on the device, this logo was chosen as the final logo.



Product name options

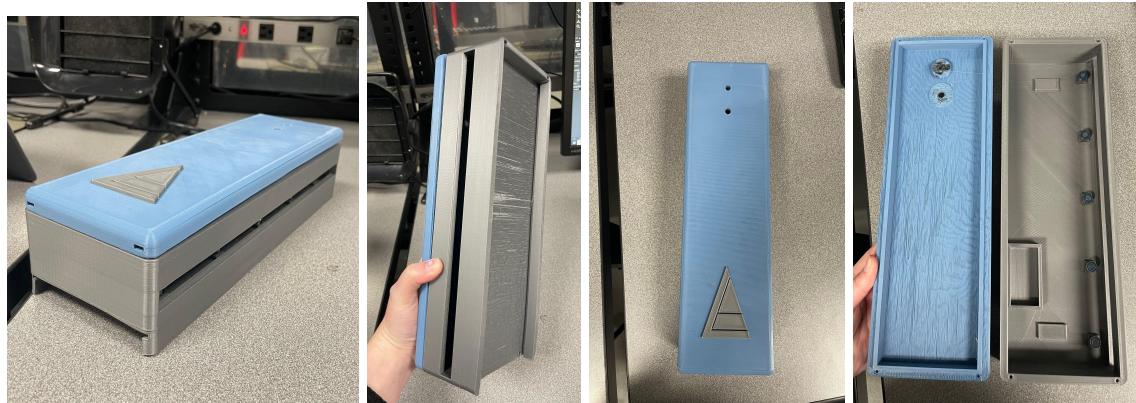
- Glow
- Ray
- Light
- Lux (Latin for light)
- Illuminate
- Line
- Align
- Edge
- Rule
- Straighten
- Adjust
- Even
- Fix
- Write
- Print
- Note
- Create
- Guide

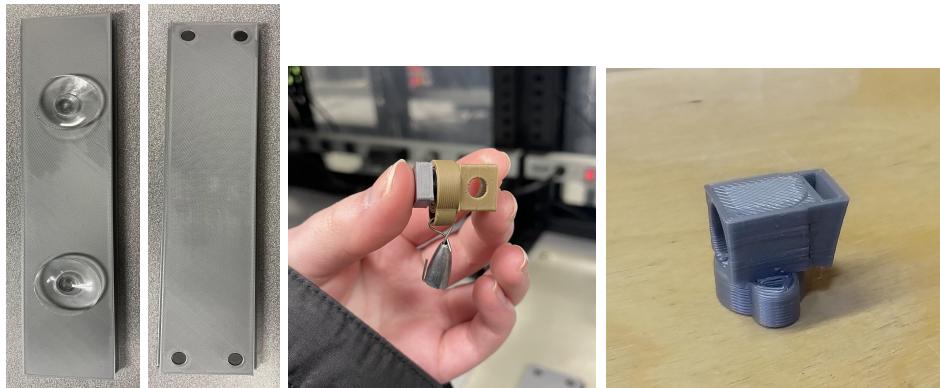
Combinations:

- Write align
- Align a line
- Even edge
- Adjust align
- Rule ray
- Glow guide
- Even edge
- Light write
- Write light
- Even ray

Testing/Refining:

Below are some pictures of the first 3D printed prototype. This was 12" long x 4" wide and had lasers that projected 10" apart, 5" apart, and 2.5" apart. The right side of it had a narrow opening for the lasers to come out of. Each laser had its own bearing system so that the lasers would always be parallel to the ground (see bottom right picture). The back of Align a Line had a groove in it so that the interchangeable backs would slide right in, making for an easy switch between the suction cup back or magnetic back.





After making the first version of Align a Line, we were ready to get feedback. Two elementary teachers tested the product and filled out a survey to leave any feedback they had. They were both very excited about it and thought it was a brilliant idea. They suggested making the body smaller and to make the lines brighter. While talking with our professor about it, he gave great suggestions on how to make the lasers parallel to the ground using one leveling system instead of individual ones for each laser. So we went back to the drawing board!

We were not able to change the brightness of the lasers due to the limited time and resources. But we changed the leveling system completely. This system now has one bearing on the back of the device that is much more durable and consistent. This moves freely from the device, ensuring that it is always parallel to the ground. We were also able to make the body smaller. Pictured below is the side by side comparison of prototype 1 and 2. The one on the right was the first prototype. The one on the left is the new and current one, sizing to 11.5" x 3". We also changed the right edge of the device so that there are now 5 holes where the lasers come through, instead of the narrow opening all the way down it.



We are so excited about Align a Line. This was a blast to make. Working as a team with very different areas of study was something that made this experience unique. We had to come up with our own deadlines for things, delegate different tasks, work on communication, collaboration, problem solving as a team, and learn from our own strengths and weaknesses throughout the process. Together we were able to create something we are proud of and are so thankful we had this opportunity to put our different sets of skills and creativity together.



Thank you!

-Holly & Chase