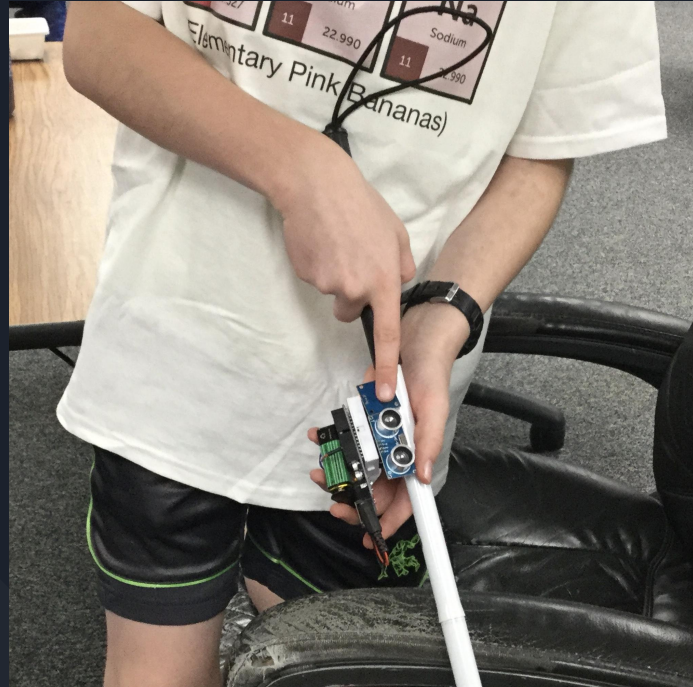


A Steak in the Dark



By: Elementary Pink Bananas (Sam, John,
Tristan, Tom, and Kason)

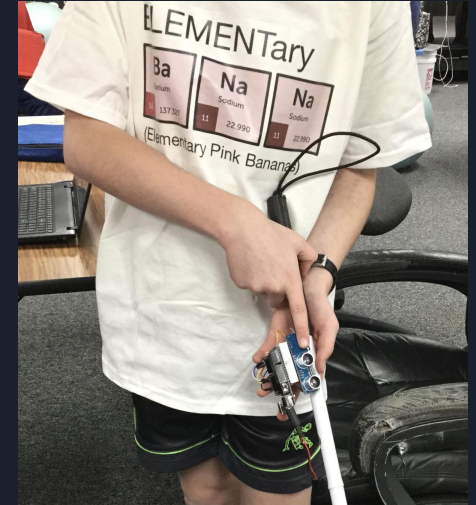
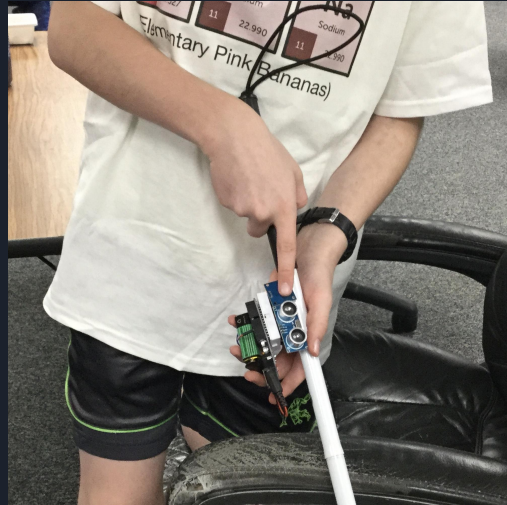
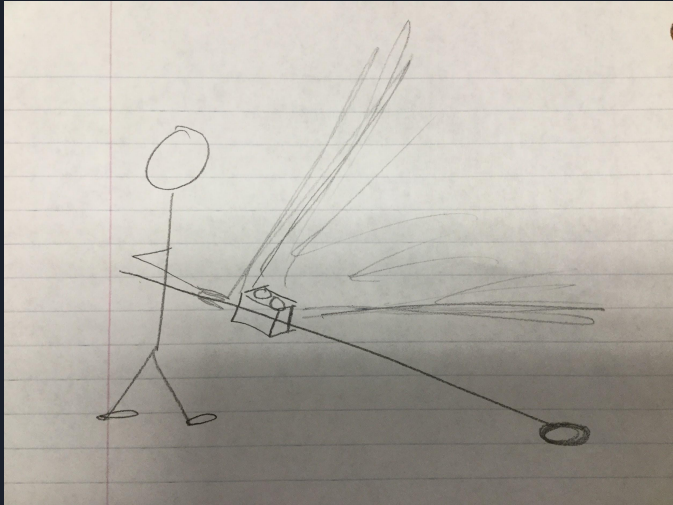
The Problem



After interviewing Alana, we understood a problem that blind people have in "seeing" above ground obstacles. This means blind people are in danger of hitting themselves in the head by running into things that they can't sense with their cane on the ground.

Develop a Possible Solution

We are trying to make a stick for blind people that doesn't just help the person find obstacles on the ground but uses ultrasonic to "look" up. We had a blind person, named Alana, come over and tell us about her being blind. She likes putting her finger forward on her stick like the stick is an extension of her finger. After she left we got the idea of where to place the ultrasonic sensor. That is what we are working on now.





Our Process

After brainstorming and deciding on our solution we started our design process. This included designing a prototype, testing, and evaluating it. We learned that we kept improving our design before we actually finished our first idea. This meant that we didn't ever have a completed product in the end.

The Process

We started working on our project in October. Our coach presented the idea in our MakerSpace club, which meets every Wednesday. We soon realized we wouldn't finish if we only met once a week because each trial took from 1-6 hours to print. The 3D designer started a routine of adjusting and printing every morning and lunchtime. In the beginning we had two 3D printers working but one got clogged and our coach couldn't repair it. It took us a long time to get the holes to fit our ultrasonic sensor.

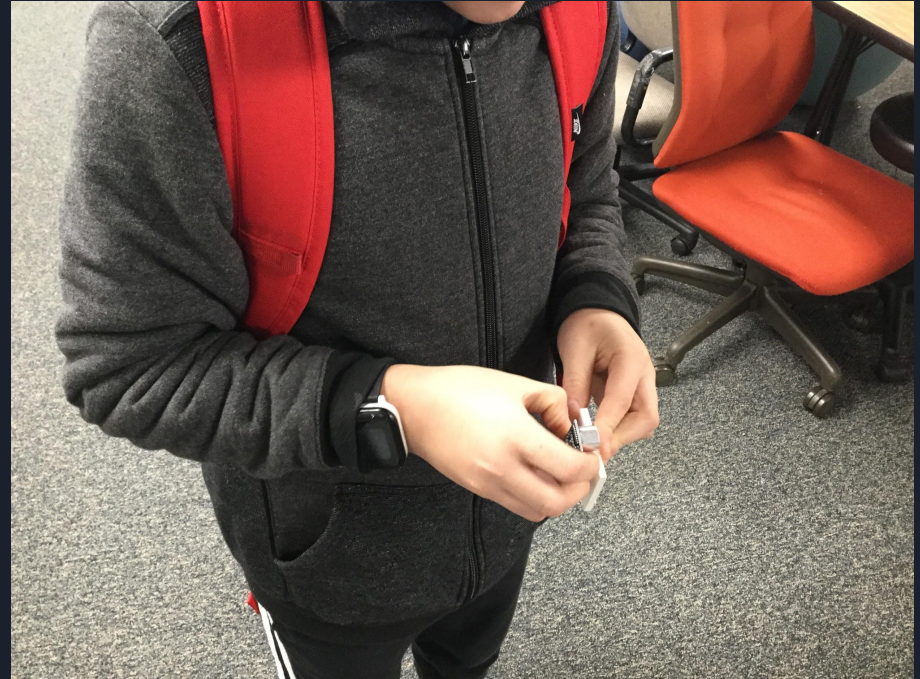
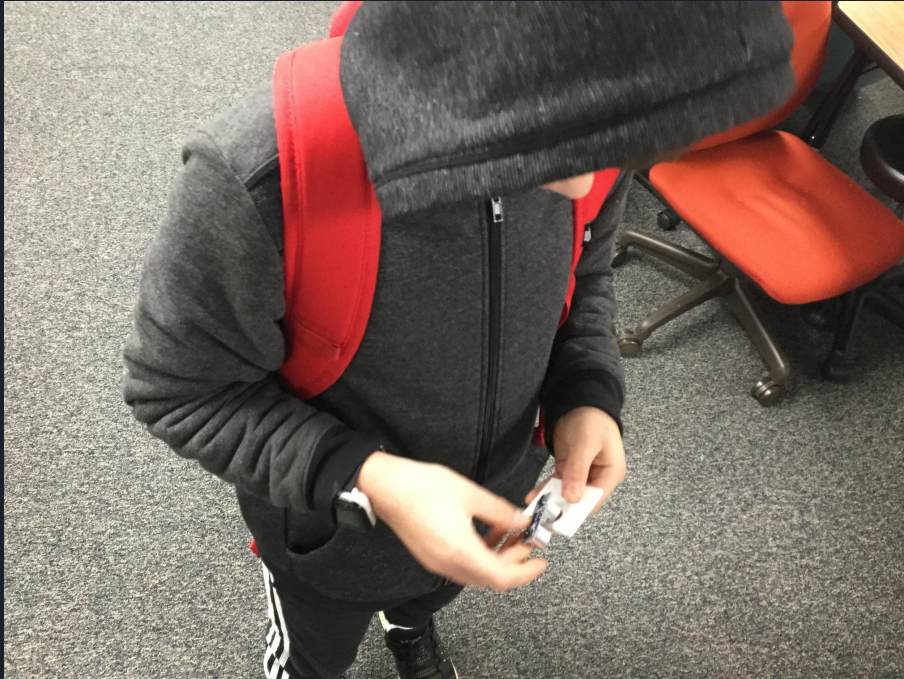
Building the case was also difficult. It took us many tries to get a case that would fit all the electronics and our current product is still not finished.



The Process



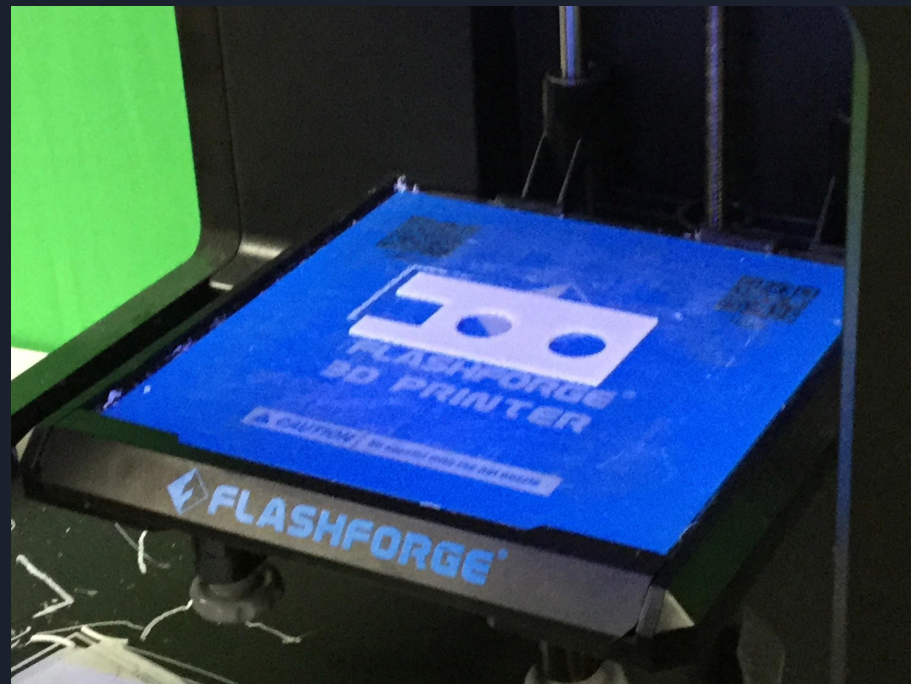
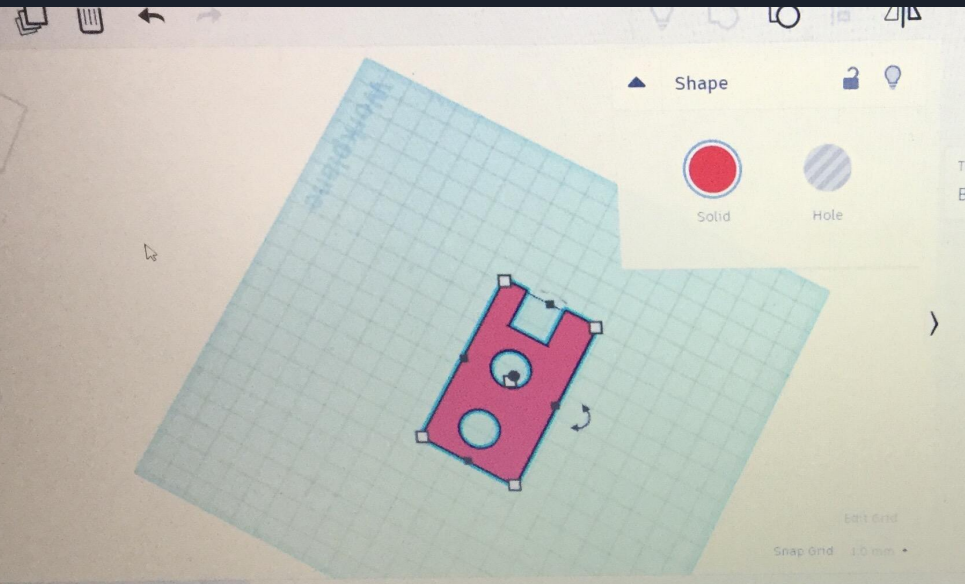
The Process



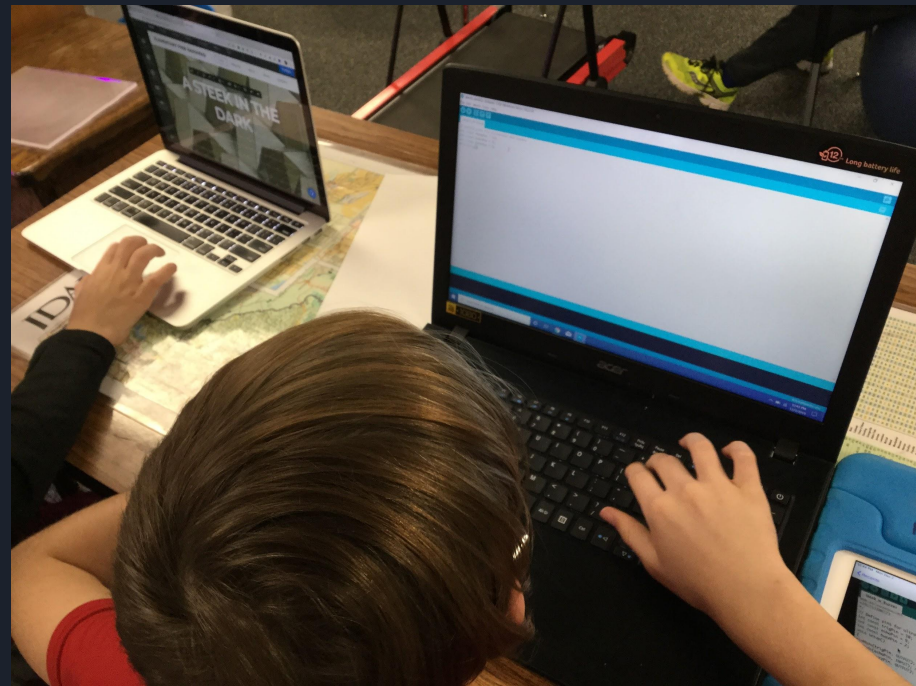
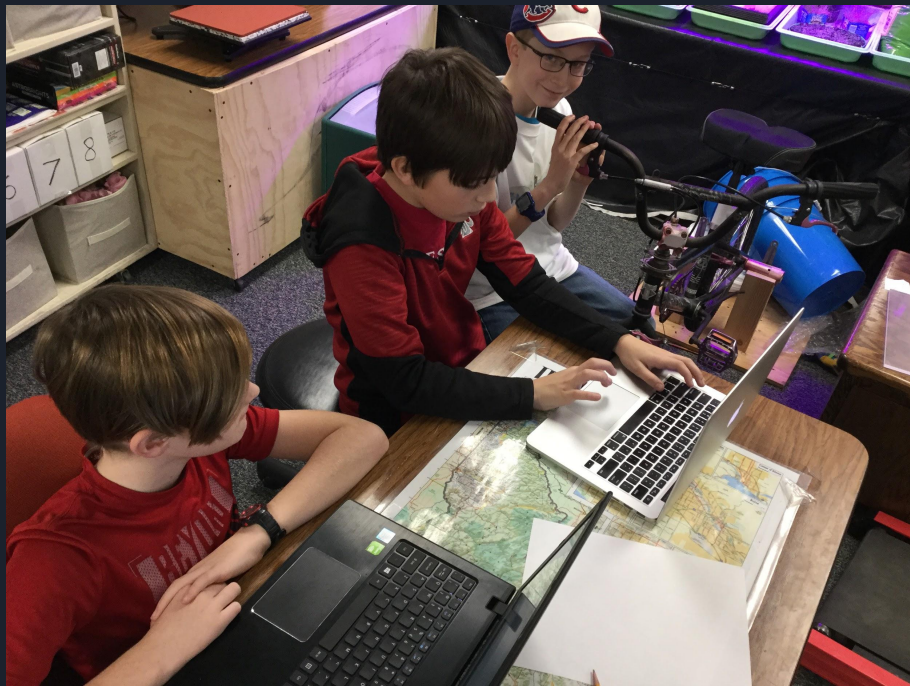
The Process



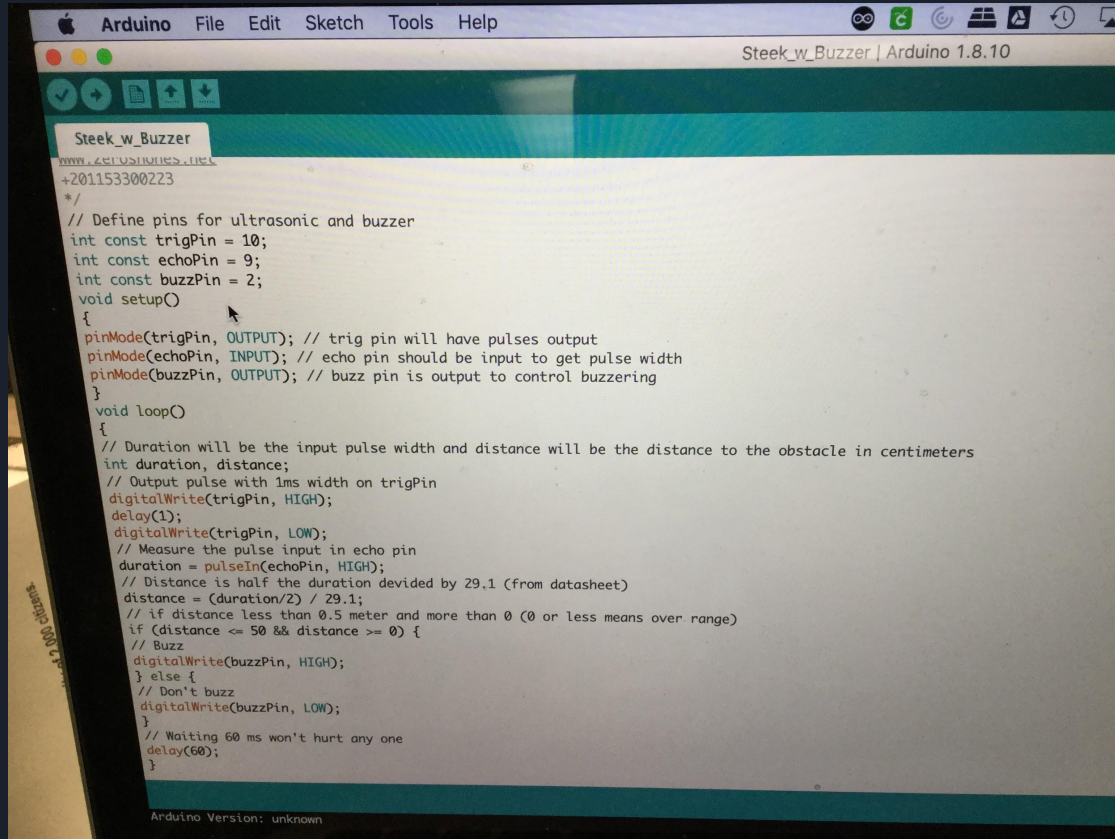
The Process



The Process



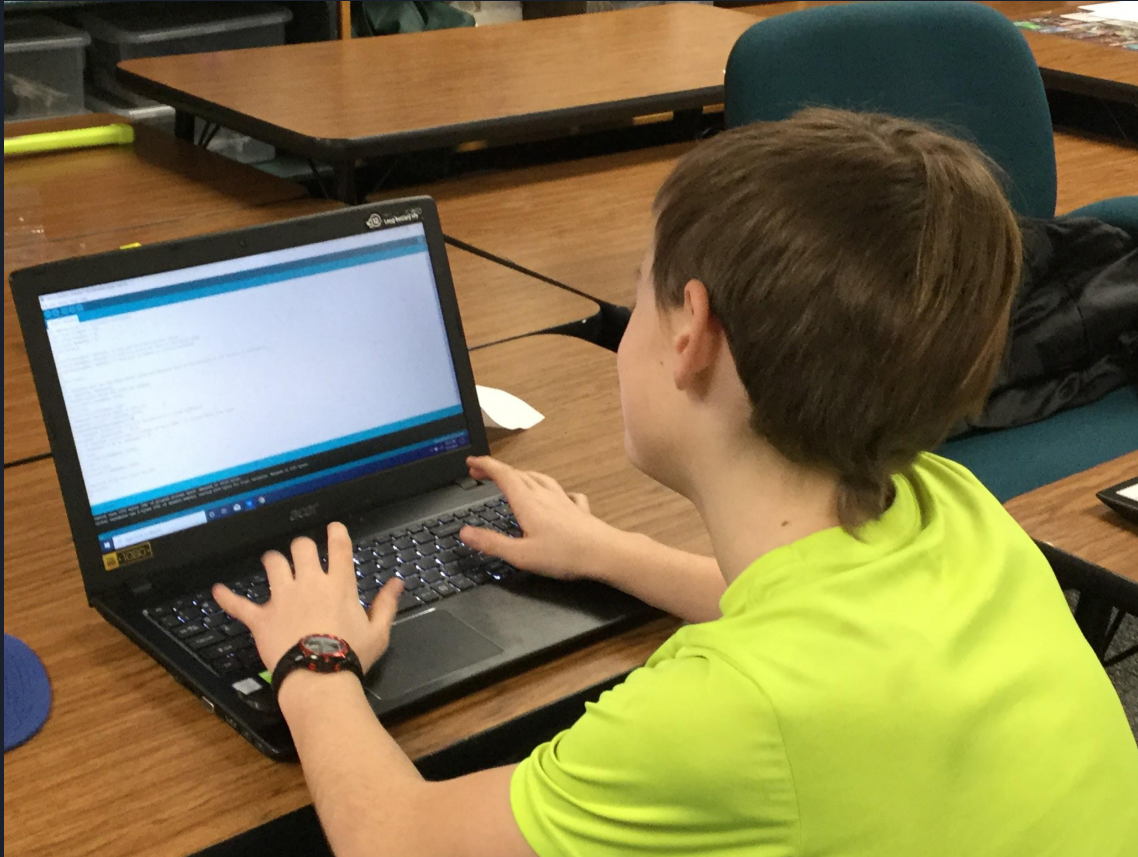
The Process



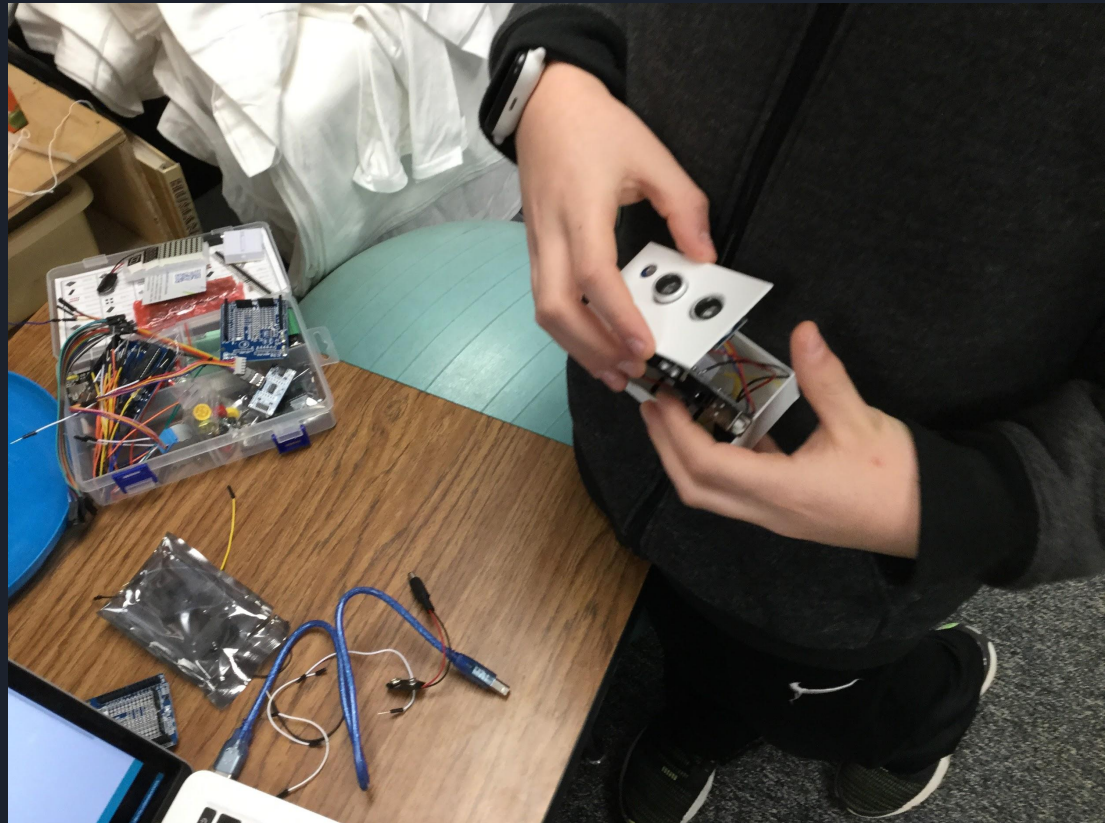
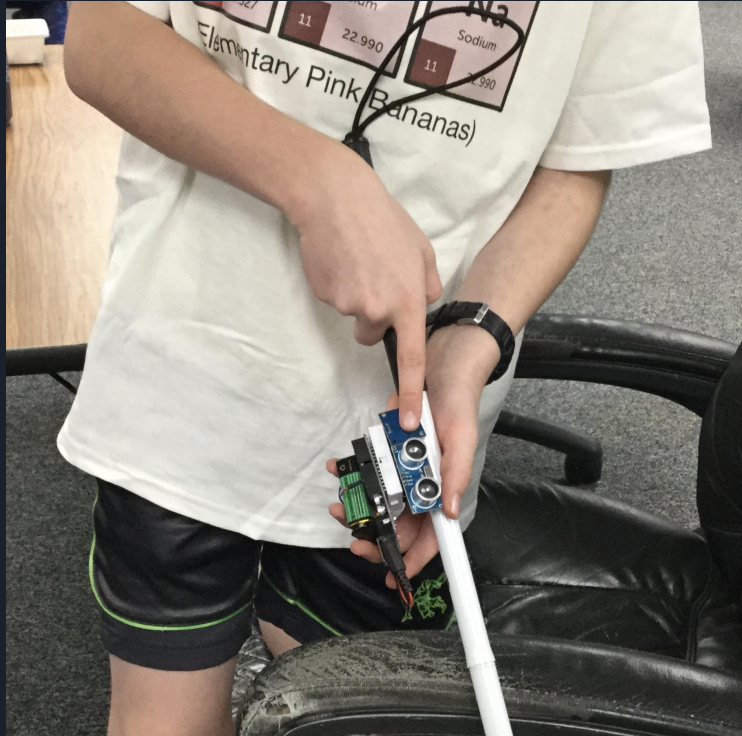
The image shows a photograph of a laptop screen displaying the Arduino IDE. The window title is "Steek_w_Buzzer | Arduino 1.8.10". The sketch is titled "Steek_w_Buzzer" and contains the following code:

```
Arduino Version: unknown
Steek_w_Buzzer
www.ccfusion.com
+201153300223
*/
// Define pins for ultrasonic and buzzer
int const trigPin = 10;
int const echoPin = 9;
int const buzzPin = 2;
void setup()
{
  pinMode(trigPin, OUTPUT); // trig pin will have pulses output
  pinMode(echoPin, INPUT); // echo pin should be input to get pulse width
  pinMode(buzzPin, OUTPUT); // buzz pin is output to control buzzing
}
void loop()
{
  // Duration will be the input pulse width and distance will be the distance to the obstacle in centimeters
  int duration, distance;
  // Output pulse with 1ms width on trigPin
  digitalWrite(trigPin, HIGH);
  delay(1);
  digitalWrite(trigPin, LOW);
  // Measure the pulse input in echo pin
  duration = pulseIn(echoPin, HIGH);
  // Distance is half the duration divided by 29.1 (from datasheet)
  distance = (duration/2) / 29.1;
  // if distance less than 0.5 meter and more than 0 (0 or less means over range)
  if (distance <= 50 && distance >= 0) {
    // Buzz
    digitalWrite(buzzPin, HIGH);
  } else {
    // Don't buzz
    digitalWrite(buzzPin, LOW);
  }
  // Waiting 60 ms won't hurt any one
  delay(60);
}
```

The Process



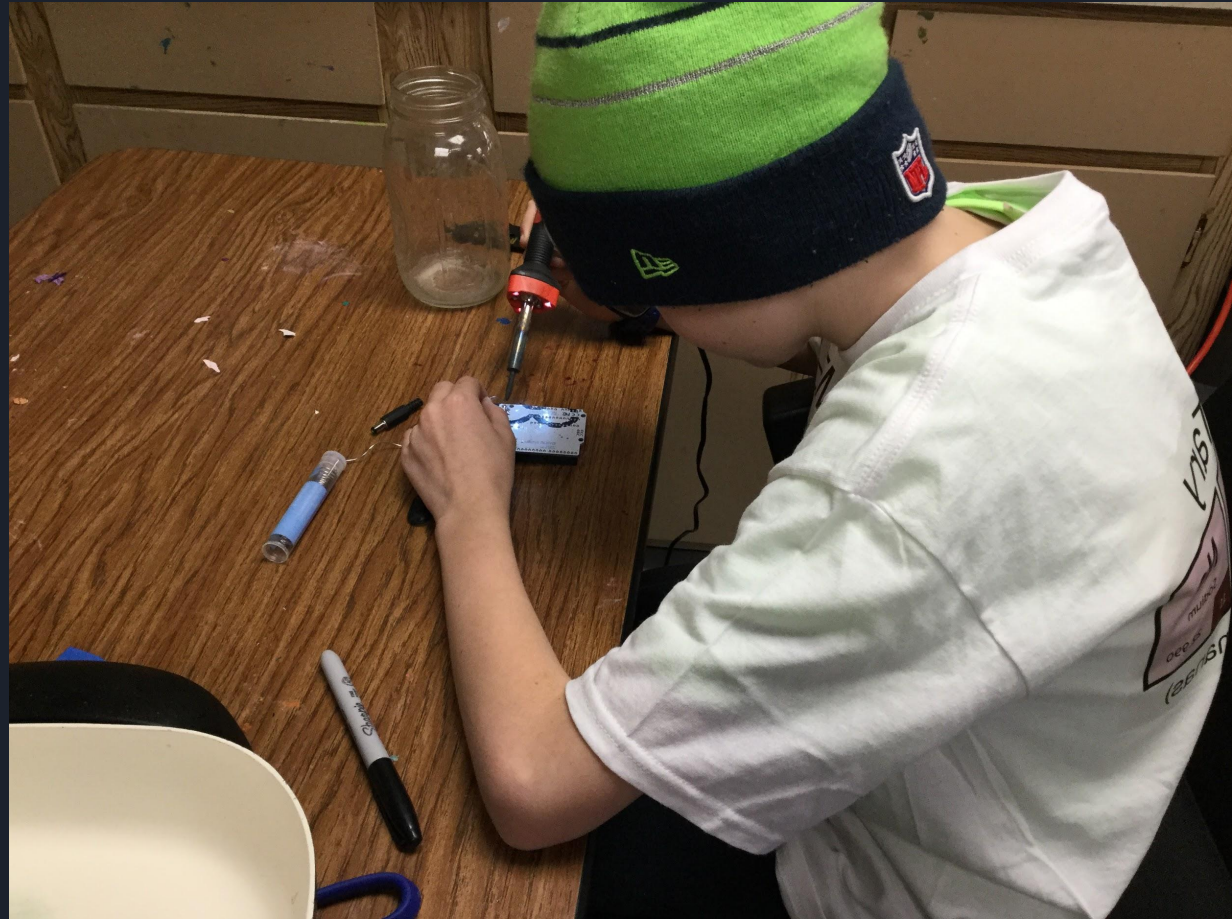
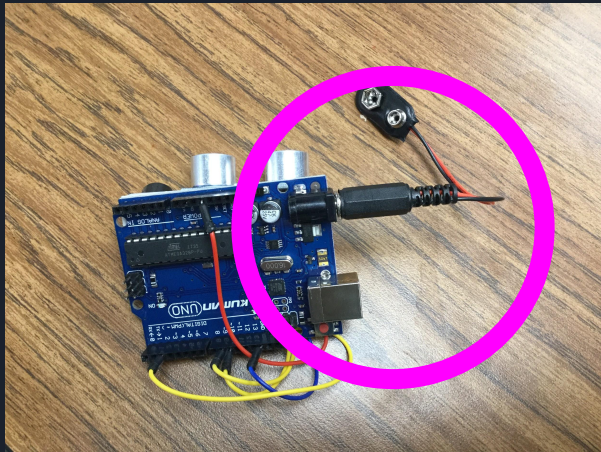
The Process

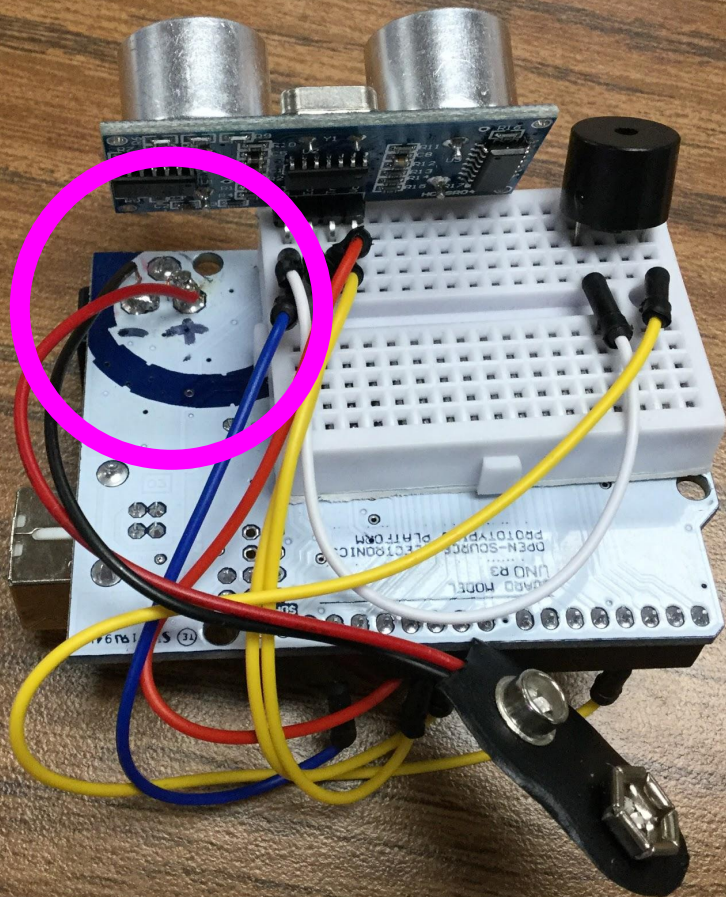


The Process



The Process





The Process



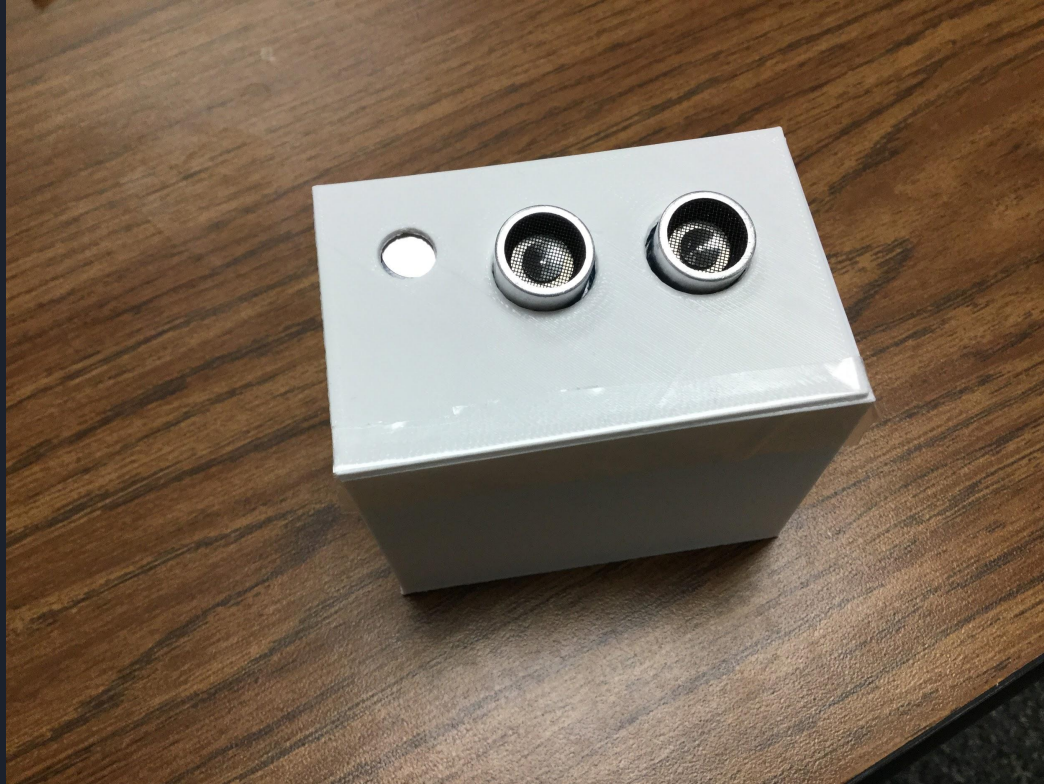
The Problem



The Problem



Communicating the Design



This is the beta version of the Steek. It will detect obstacles and give a warning when the obstacle gets close. It can be programmed to fit the desired distance of the user.



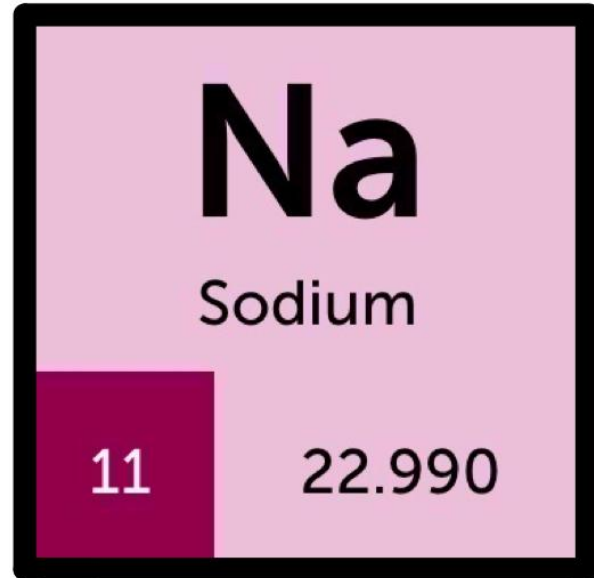
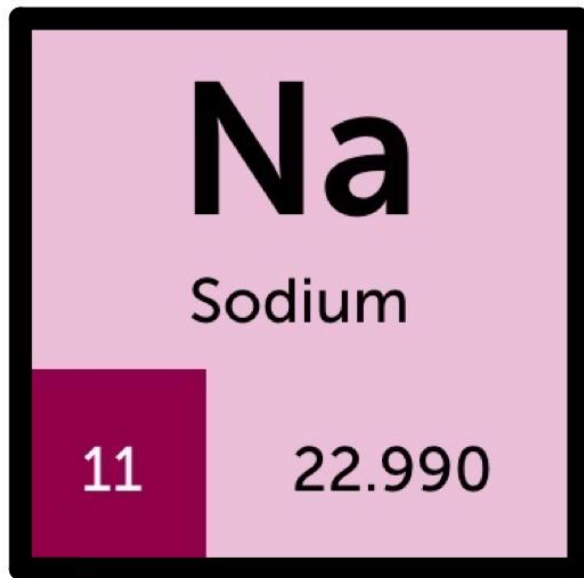
Next Steps

- Make it smaller
- Make it attach to a cane
- Program the touch sensor to work
- Add bluetooth so only the user can hear the alarm



This product is brought to
you by the ...

ELEMENTary



(Elementary Pink Bananas)

The Team

Kason - 3D Engineer

John - Programming Engineer

Samuel - Web Designer and Programming Consultant

Thomas - Electronics Engineer

Tristan - Engineer

Dr. Stelck - Coach

