
AIR QUALITY DISPLAY

SPECIAL THANKS

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HAPTIC ACTIONS

Through design and fabrication processes that are informed by how various surfaces can perform, students in haptic actions will develop a large scale architectural installation that speculates upon the potential found within combinations of standard materials. The material relationships will provide the framework to transform the traditional assumptions of a material and produce hybrids. Particular focus will be devoted to structural, acoustic and visual performance as they relate to the creation of space. The installation from haptic will be a collaborative project. Given the design build nature of the class, students should expect to physically produce a significant body of work. Students will learn the fundamentals of a select number of CAD/CAM processes but will be expected to build upon these skills outside of the context of formal lectures.

THE PROBLEM

The Group Against Smog and Pollution (GASP) is a non-profit citizens' group in Southwestern Pennsylvania working for a healthy, sustainable environment. GASP has been a dilligent watchdog, educator, litigator, and policy-maker on many environmental issues, with a focus on air quality in the Pittsburgh region. GASP became our clients halfway into our semester in Haptic Actions, and we couldn't ask for better people. GASP wanted a haptic display that acts as a way for pedestrians to learn about the current air quality. They wanted the display to not only inform pedestrians, but to catch their attention as they walk by the GASP office on Penn Ave.

for more information about GASP, checkout their website at *www.gasp-pgh.org*

OUR PROCESS

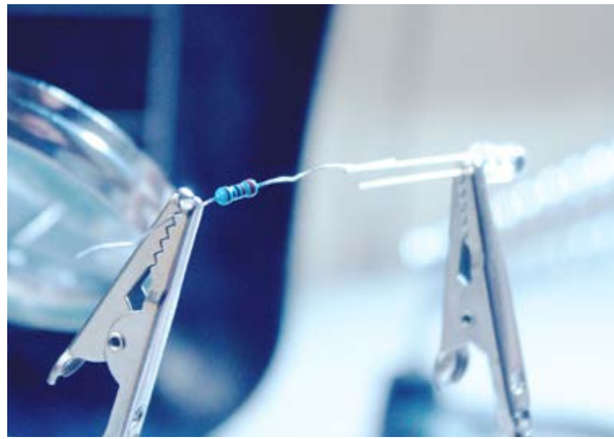
Fabricating the display began with milling out the female inserts from a leftover discounted Cherry Plywood. These inserts housed a lasercut silhouette of figures with lungs. The inserts had holes in them which allow for light to shine from the back of the plywood to the laser cut lungs. The laser etchings were made out of poplar, and planed down to 1/8." Poplar was also complimentarily used to create a frame for the cherry plywood. This frame would end up housing light boxes and all the wirework in the back. The Frame was cut from a 110" long piece of poplar. This was cut at angles in order to save as much wood as possible. After planing and jointing, the pieces were cut on a meitergage on the tablesaw, which oriented the blade at 45 degrees.

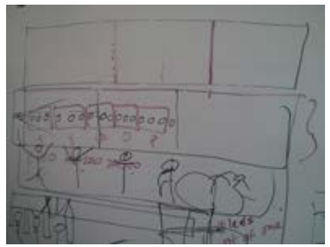
Once all the pieces were even, a dato blade was set up to carve out an incision for the frame to sit in. Tolerance was left in the depth so that the frame can be assembled and disassembled before glue up, and so the frame could move slightly in case there were any issues in the way the other materials met. Another incision in the back

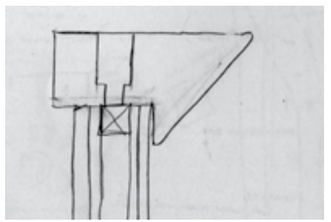
was datoed in order to house a screwed-in-back to protect the electronics from the elements, and from people reaching in. Before gluing the frame together, we pre-drilled holes to insert nails into the frame. These nails when inserted aligned the frame during glue up.

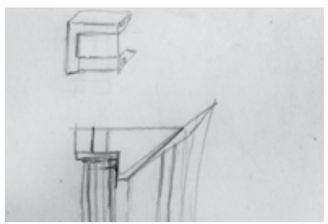
Once dry, we sanded everything and laser cut light boxes for the LEDs which we would insert into the back of the plywood inside the frame into the female inserts. These boxes illuminated the light, and were made from an inexpensive green acrylic. The green acrylic was spray painted white with Krylon Fushion. After drilling a hole for the LEDs to sit in the box, we created shelves inside the frame to help keep the acrylic from moving inside the plywood inserts. This was accomplished with L brackets, Zip ties, and datoed plywood. Once the boxes were installed into the frame, we then utilized the shelves to house the Arduino, battery, and wiring.

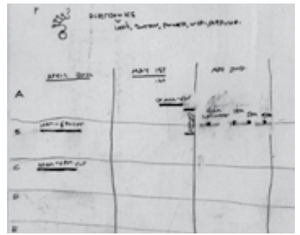
For the electronic side we used an Arduino microcrontoller, along with a WiFly shield and multiple bright LEDs. The Arduino WiFly shield is set to autoconnect to a wireless network on boot up. Afterwards it sends a HTTP request to airnow.gov (the site that houses the most accurate air quality readings). Once connected, the WiFly pulls the current air quality data for Pittsburgh. Once this value is downloaded, the Arduino basically waits for a button push. The LEDs are the standard small size (5mm) but they are much brighter than others. Each LED has been soldered onto a resistor and then connected directly to the Arduino.



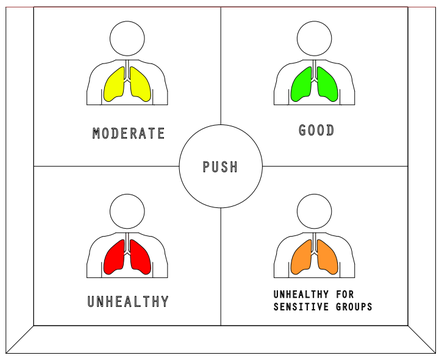


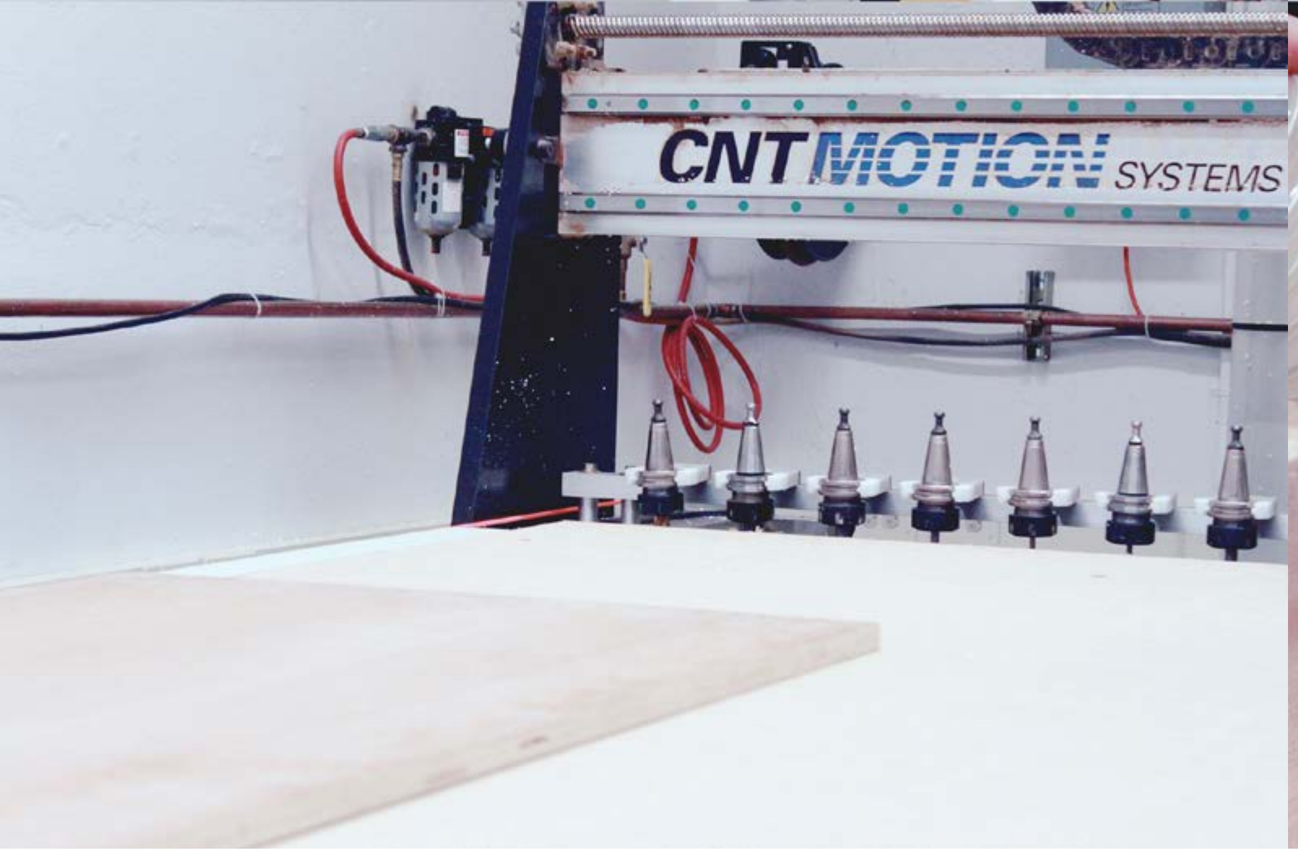






GASP AQI Display - v2

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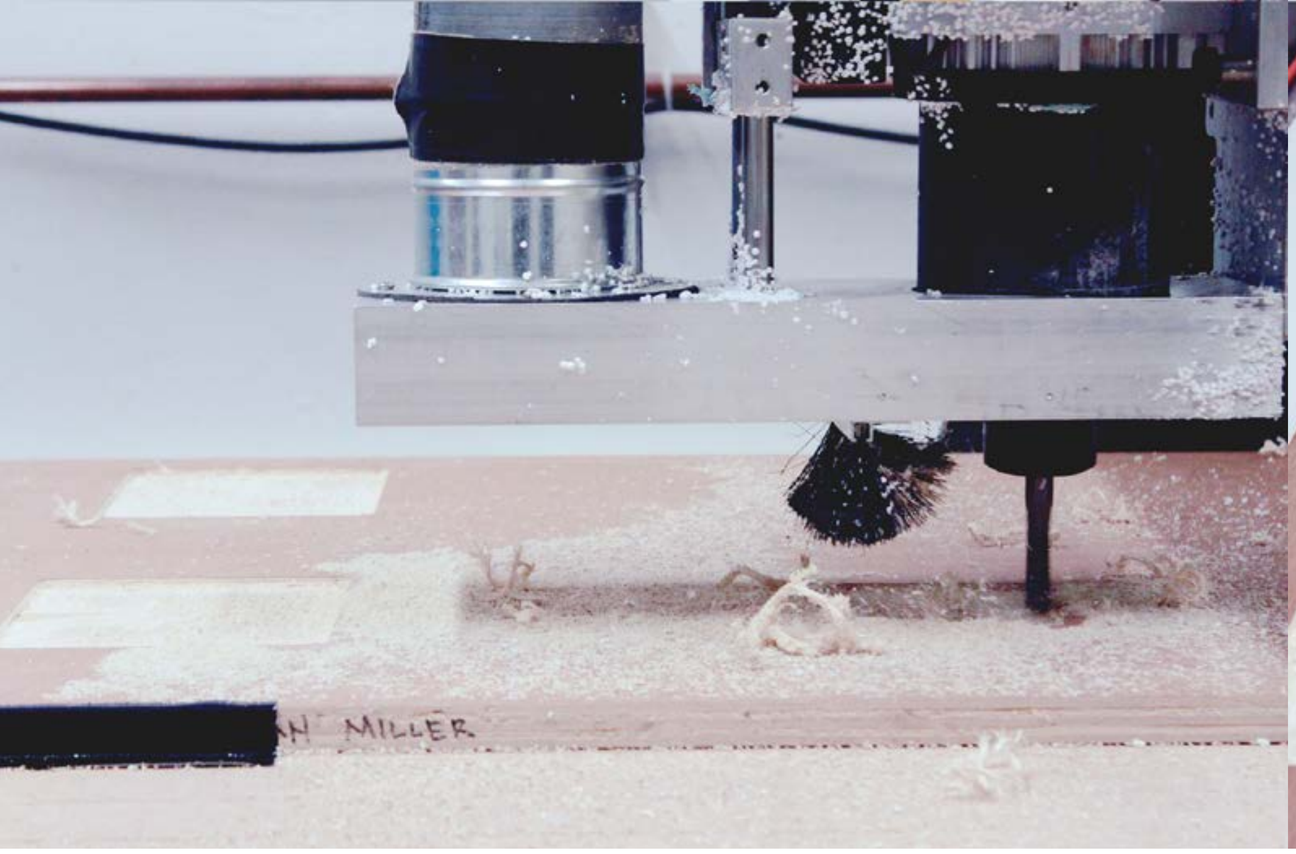
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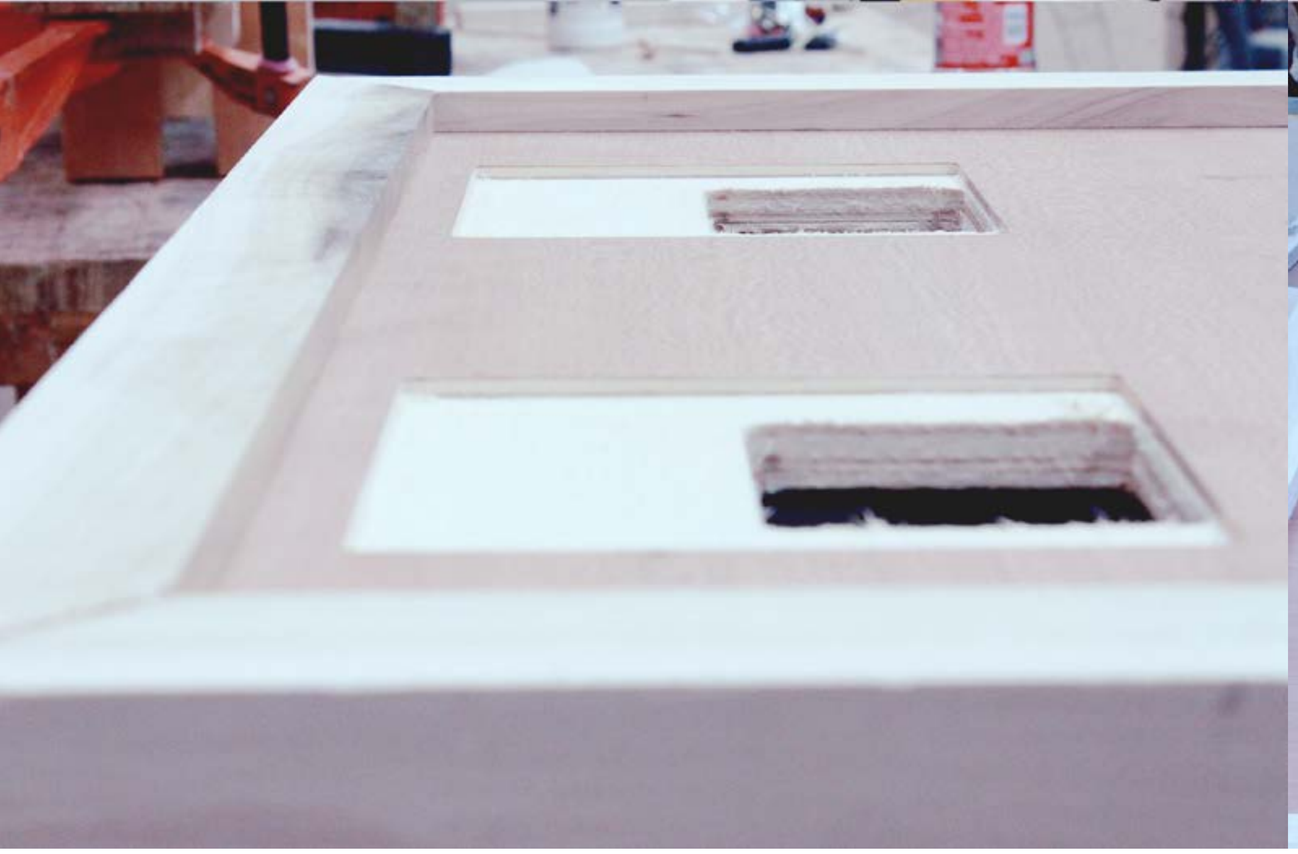
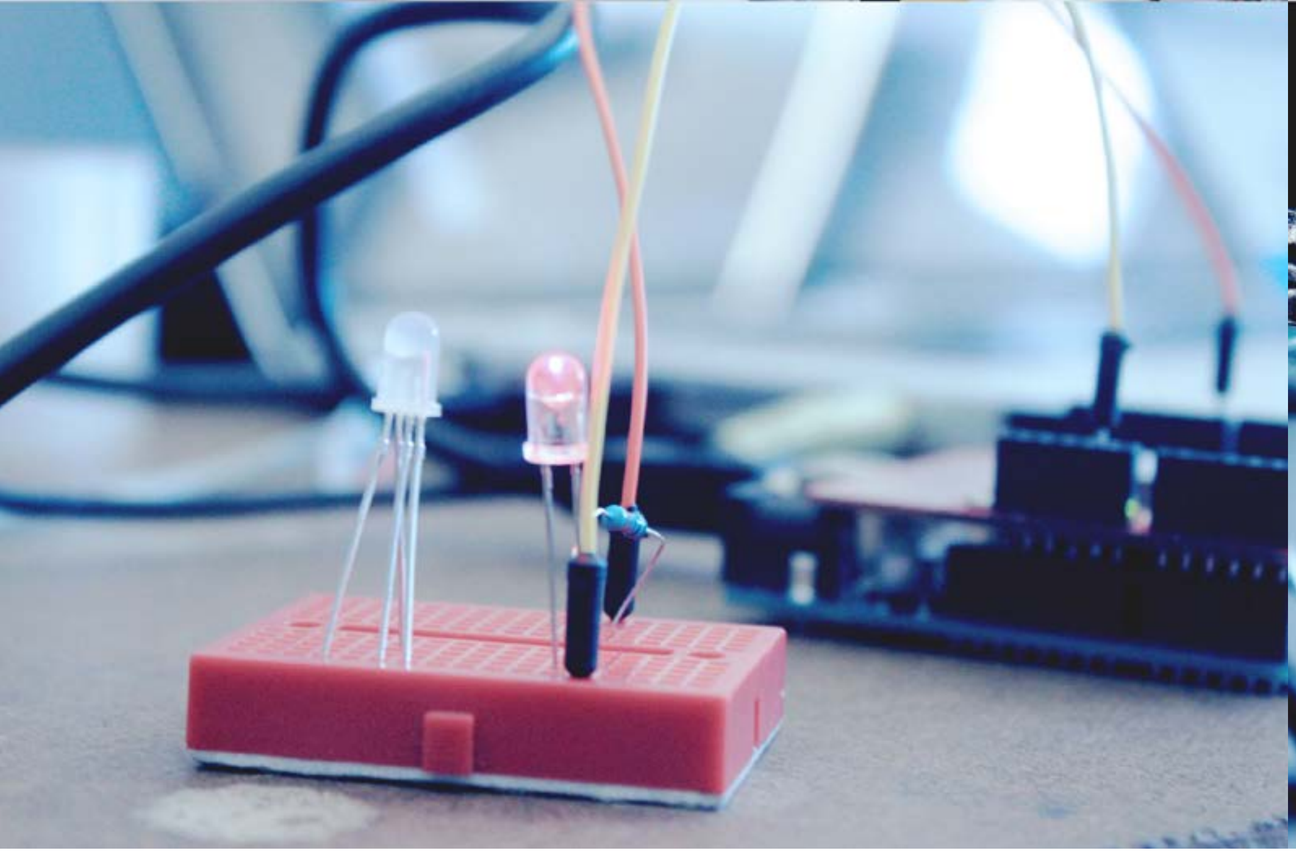
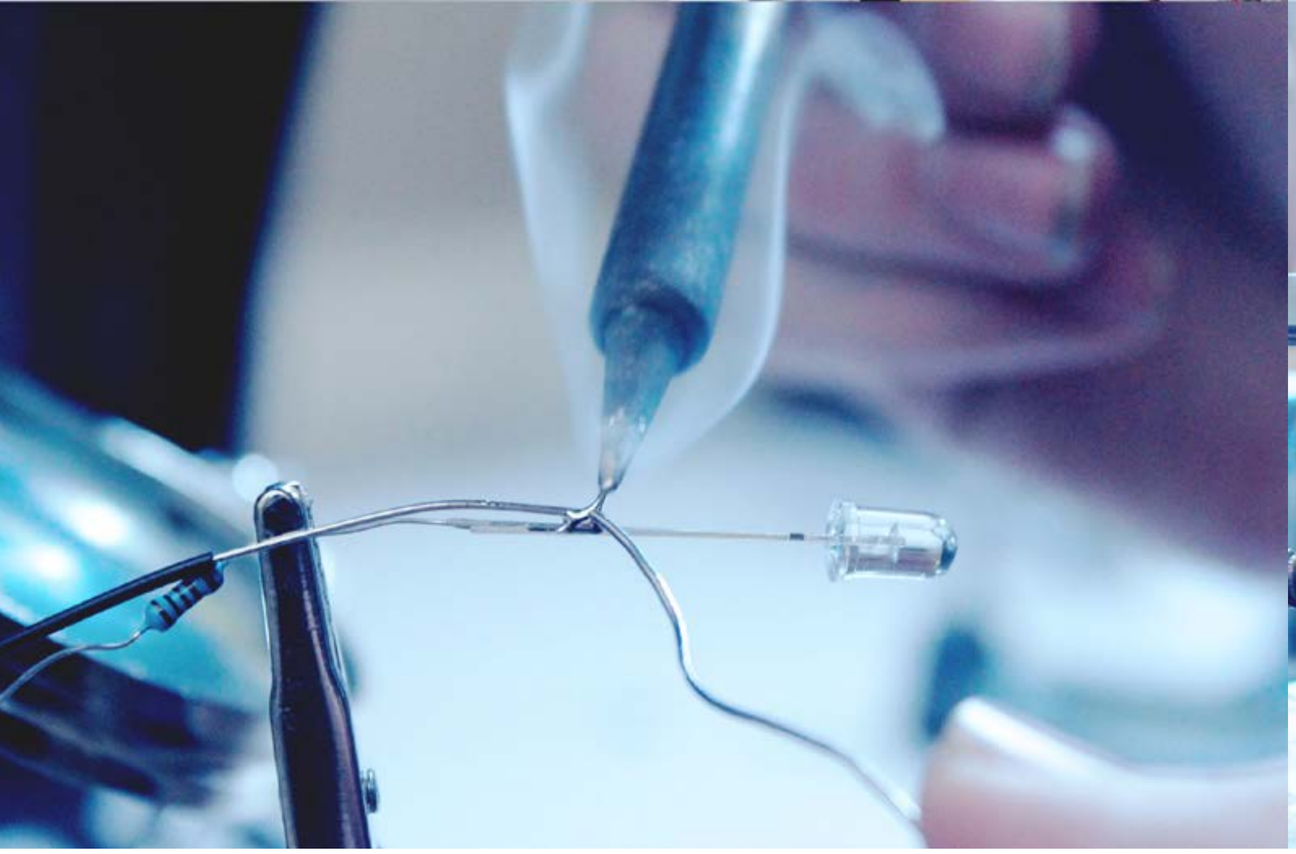
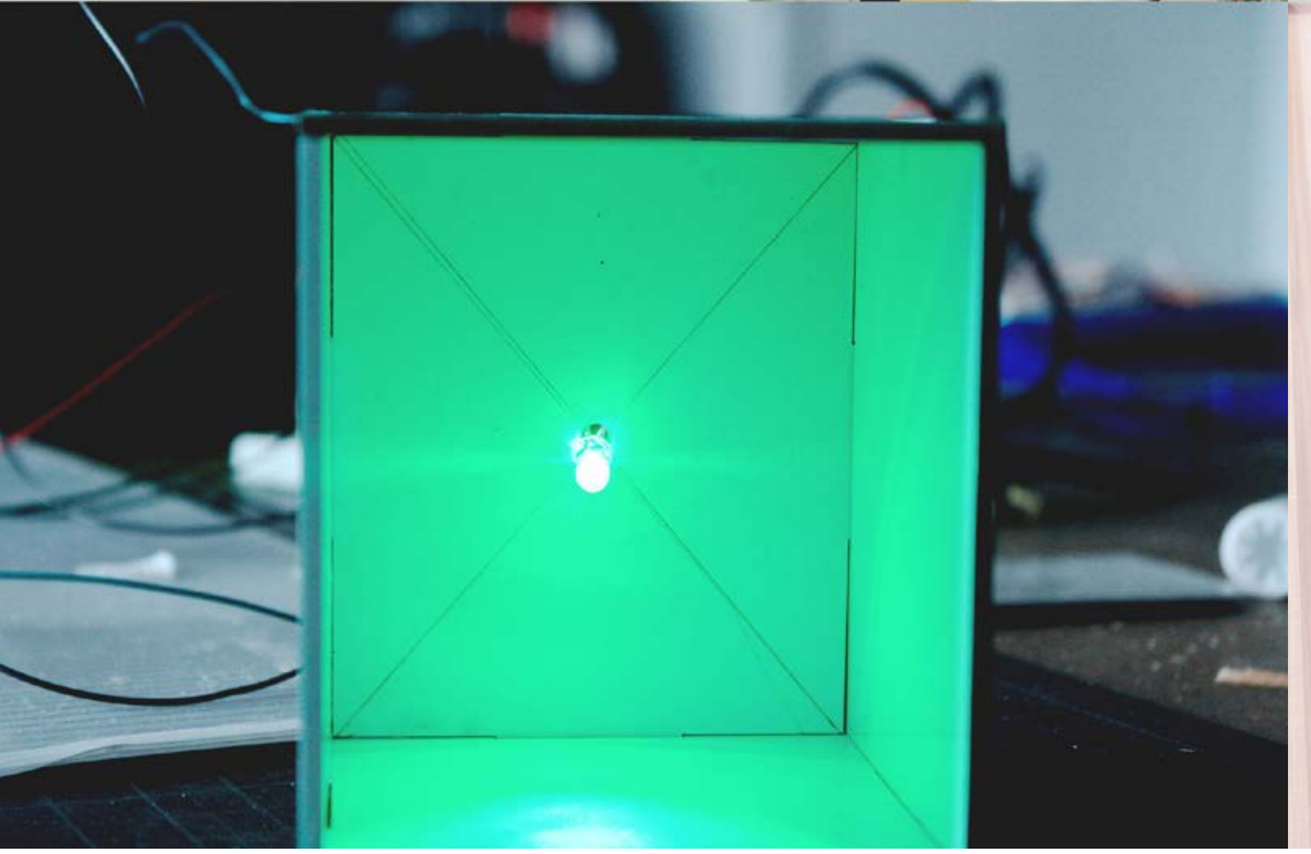
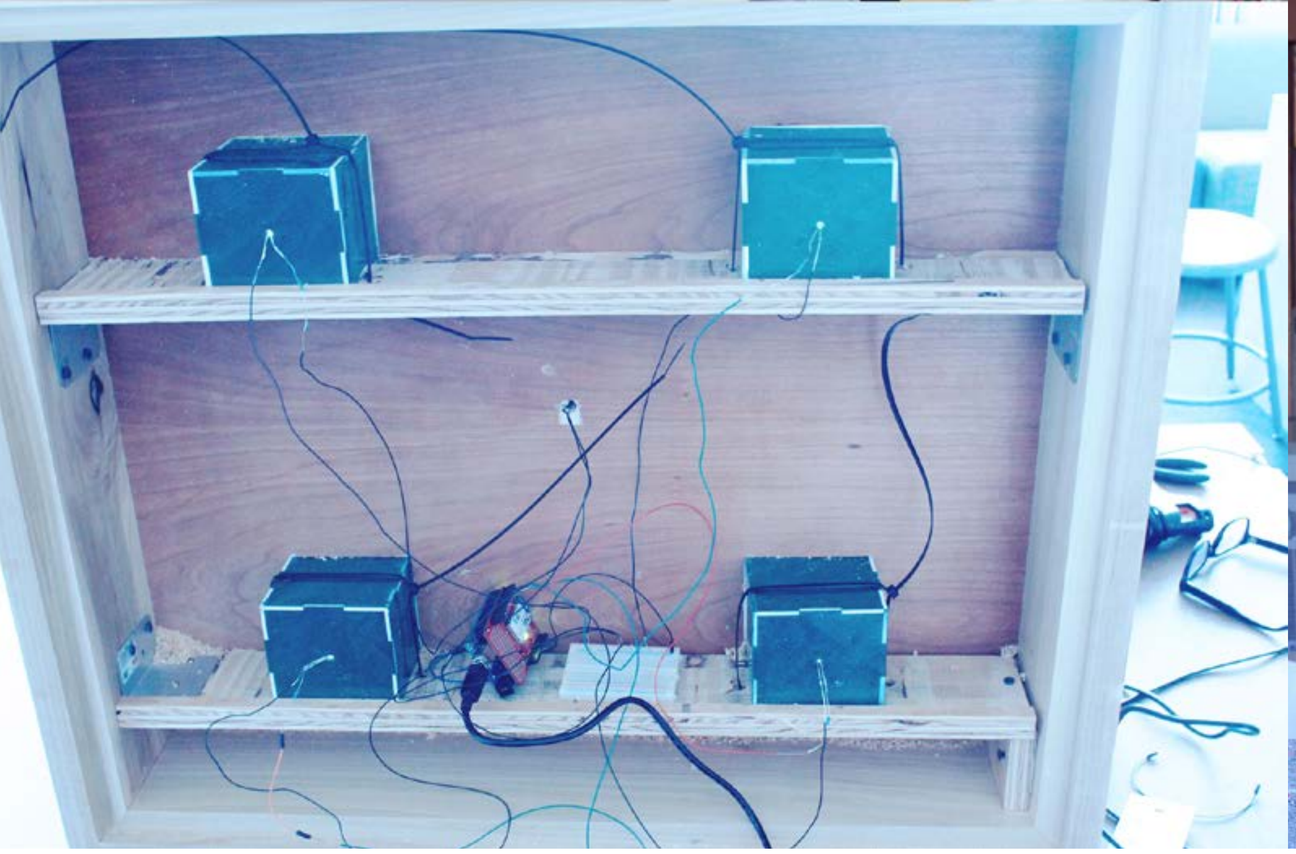



GOOD
MODERATE
PUSH
UNHEALTHY
UNHEALTHY
FOR SENSITIVE GROUPS









THE FINAL PRODUCT