Waste Haste

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Week 1 - Initial Design

Our initial plan for this game was a trash sorting game - one where the players would battle it out with quick reflexes to sort trash faster than their opponents. Players would be able to learn about what items can be recycled and trashed.

Each player would use two cans, and open the lid of the can they believe the current item belongs in. If they get it right before their opponent, they receive a point, and if they get it wrong, the other player can answer. If both players get the answer incorrect the game awards neither a point. After one of these outcomes, a new item is displayed and the game continues.

The object of the game was to reach 10 points before your opponents.

Week 2 - Acquisition of Supplies

Week 2 was when we began gathering supplies, like the trash cans, cardboard, and the Teensy for use in creating the controllers.

The research was conducted for each of the objects we would use in the game. Each one was placed in a category of either Recyclable or Trash.

Assets for the items were created soon after using stock images and had their background removed via photoshop.

Week 3 - Unity

During Week 3 the base code for the asset library was created. Certain aspects of the code, like the round structure, were also initially tested during this time.

A bug we encountered during early programming was that the other player would still be able to answer the question after the first player had gotten the question right. We quickly add more variables to control the exact flow of the 'if' statements leading up to how the game interprets a correct answer to remove this bug.

Week 4 - Cardboard

The lids were cut during this week and copious amounts of copper tape were applied to both the lids and the cans themselves after some basic testing to check the currents.

To create the trash can controllers, we placed copper tape on the lids with the intent that the bottom of the lids would have copper tape/foil that would bridge both sides of the can, sending a signal to the Teensy.

We had to reapply the tape multiple times after receiving mixed signals while closing the lids during initial testing.

Week 5 - Hardware

During this week we wired and sautered the wiring to both the Teensy and the cans. Each can have three wires going through it. The negative and ground wires are on one end, and the positive wire is connected to the other end. When the lid is placed on the can, the copper tape at the bottom joins the two sides, completing the circuit and sending a signal.

Each ground wire is soldered to a resistor and then joined into a single pin on the Teensy.
Each positive wire is soldered together and also connects to a single pin.
 The four negative wires were soldered to pins 15, 16, 17, and 18 respectively for each of the four cans.

We quickly ran into multiple bugs during this time. For one, we had to re-solder the resistors after noticing that even the smallest inputs or movements of the table were registering inputs. Soon after we had to change the pins the negative wires were soldered to on the Teensy from being directly next to each other because they were also sending mixed signals. We instead soldered them to every other pin, thereby being pins 15, 17, 19, and 21.

Week 6 - Art and Finalization

After some hardware testing and bug fixing, we painted and cut out the art pieces for the game, like the divider, mats for the cans, and the box that holds the electronics.

We also did some playtesting with some Flash games to check to see how accurate the inputs were being registered. Moto X3M was the game we used for initial testing and to fix bugs during our final testing period.

Most importantly, we programmed the remainder of the game during this week. Animations, win conditions, sound effects, and more were added during the last few days.

Major Changes

For the most part, we were more conservative with our design than attempting to make anything too complex.

One of the largest things that changed throughout the game's creation was that the jobs and roles of the individuals have been shifted. Although our plan was originally more divided, we were keener on working on each part together to accomplish everything.

The inputs were reversed after some hardware troubles as well. Instead of lifting the lid on the correct answer you now need to close the lid on the correct answer while holding both lids up.

The Final Product

The final product of Waste Haste has largely been kept the same as the original vision. Two players compete against themselves to acquire points by correctly sorting the items that appear on screen faster than their opponent.

The game ends once all of the items have been displayed, and the winner is whoever has earned the most points by then.

Each item may be placed into either the trash bin or the recycling bin, and players choose their answer by closing the lid on the corresponding can on their side.

A start screen and tutorial have been included for ease of use.

Object Credits

To determine what items could be recycled, we used the city of Austin's official recycling guidelines, as well as some secondary sources.
https://www.austintexas.gov/recycling - City of Austin official recycling guidelines.
https://www.austinlocal.com/recycling-in-austin-what-is-recyclable-and-what-is-not.html
https://www.statesman.com/news/20180604/what-you-should-and-shouldnt-recycle-in-austin
https://www.recyclebycity.com/austin/guide

Music Credits

Title Screen:
Leblon by Kevin MacLeod
Licensed under a Creative Commons Attribution 4.0 license.
https://creativecommons.org/licenses/by/4.0/
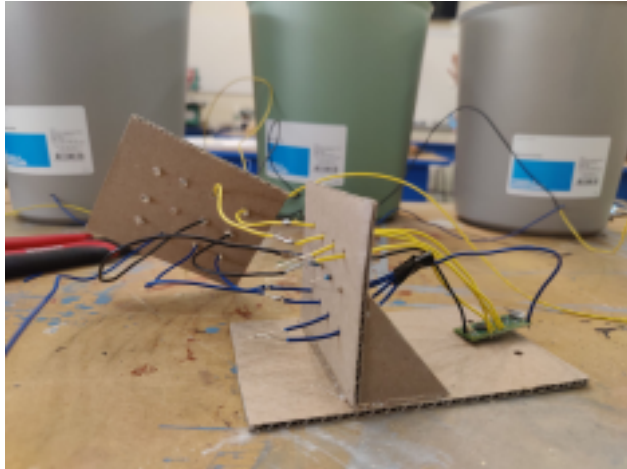
Photos
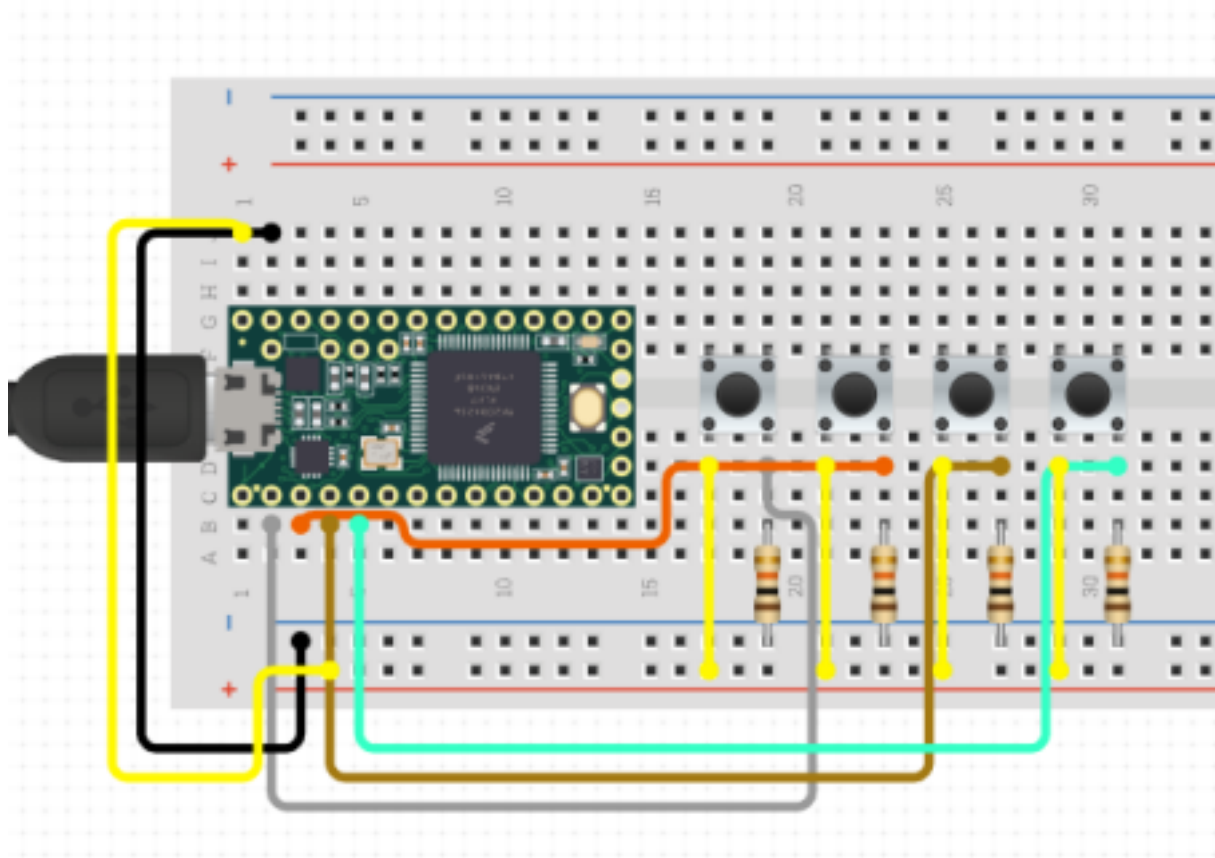
Circuit diagram of four buttons (the four trash can inputs) used during initial design. A button being pressed corresponds to the lid of the can.
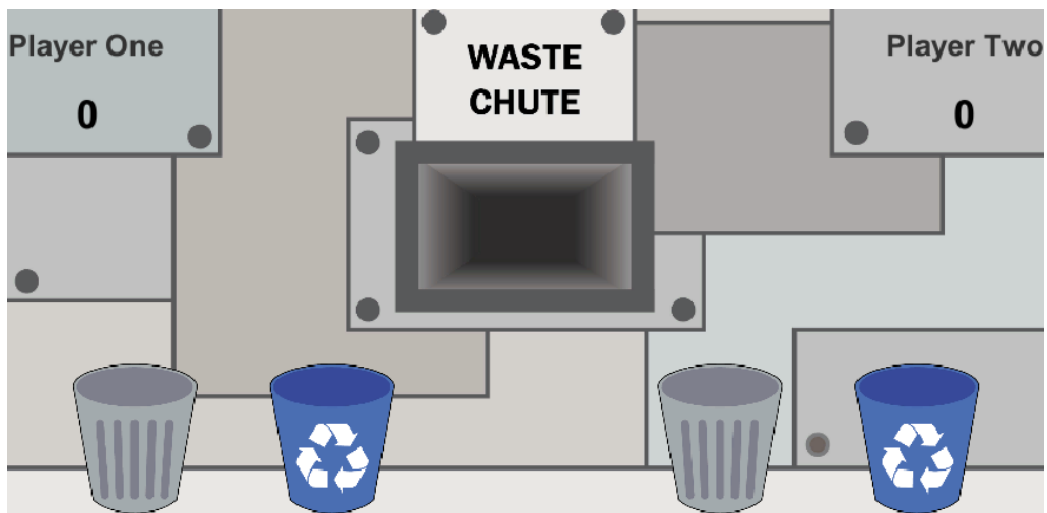
Hardware setup. Four columns each correspond to a can, with yellow being negative, black being ground, and blue being positive.

Painting the divider that separates the two sets of trash cans.

Cans with freshly painted lids and newly traced recycling logos.

In game photo of UI.