

BRIXNER



DON'T MESS WITH THE GRIZZY!

Brixner Jr. High
Klamath Falls, Oregon
Level: Middle School
Group Name: Chico & Co.

The Auto-Tunnel



Chico and Bast

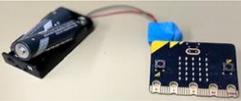


By Leah Bartlett and Stephanie Castaneda (Chico & Co.) from Brixner Jr. High's MESA Club



Mini Model

Above: A (receiving)microbit and solar panel attached to the top of the main structure. Continuous track, wheels and a servo are on the outside of the structure. The servo is attached to the top left wheel using hot glue. We used a solar panel instead because it is more reusable than the battery pack. We plan to attach the solar panel on top of the high tunnel.



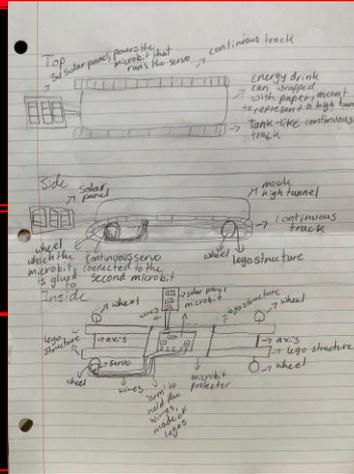
Controller

The messenger microbit. This sends out the message for the receiving microbit.

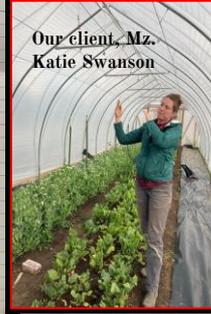


Code

Our code demonstrates a forward, and stop button by using a microbit radio system. One microbit sends a string or value, and the other one interprets it and carries out the action(s) accordingly.



← Most current mini-model diagram



Our client, Mz. Katie Swanson

User Requirements

In order to have a high tunnel, you must have a farm. You also need plants to grow in that farm. Within that, you must have a high tunnel to make an automated high tunnel. You would also need access to some kind of battery, like a solar panel.

Plan

We plan to have a moving high tunnel that moves by a push of a button.

Problem Statement

Being a farmer comes with many physical requirements, including moving large farm items. With our design, a high tunnel can be moved without any physical pushing.

High Tunnel

A high tunnel is a large greenhouse that is used to protect fruits and vegetables from the weather that could harm the plants. Sometimes the time needed to grow fully, they need to be planted before the weather is right. The high tunnel will give the plants the protection they need to start growing.

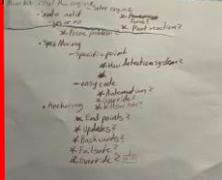


Objectives:

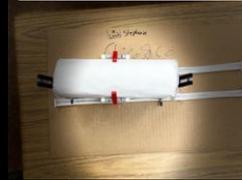
- Create a more to-scale model.
 - May need to stop using microbits for more voltage output.
- Replace the second battery pack with a solar panel.
- Get this picked up by professionals.
- Make an actual, full sized Auto-Tunnel to help our client.

Design Process →

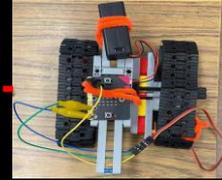
In order from left to right: Brainstorm paper from November, mini-model from Demo Day, mini-model from State, and our current mini-model.



We started with some brainstorming, which begged a lot of questions. We originally thought of an app, or an anchor spot, but eventually we decided against most of these ideas.



This was our first mini-model. We presented this one at Demo Day. It had a track made of straws, and did not move by itself. It has the energy drink can wrapped with paper, which is the only thing we kept from this design.



This was our second mini-model. After Demo Day, we deconstructed the first mini-model and made this. It has a continuous track, with a servo to spin the wheel. We also have a battery pack powering the servo, which we changed later.



This is our third and most current design. It incorporates a solar panel instead of a battery pack. It also holds the mock high tunnel on top of it.

Testing

While we were deciding whether to use wheels or continuous track, Leah tested the two. We learned that wheels make indentations in soil while continuous track did not.