Haunted House w/micro:bit

This Haunted House uses a 270˚ Servo, NeoPixel Strip, micro:bit and Bit Board to create a festive Halloween scene.

Written By: Amanda Etim



INTRODUCTION

This Haunted House uses a 270˚ Servo, NeoPixel Strip, micro:bit and Bit Board to create a festive Halloween scene.

TOOLS:

- Cardboard (1)
- Clear Tape (1)
- Hot Glue Gun (1)
- Scissors (1)
- Acrylic Paint (1)

optional

- Markers, Crayons, or Colored Pencils (1)

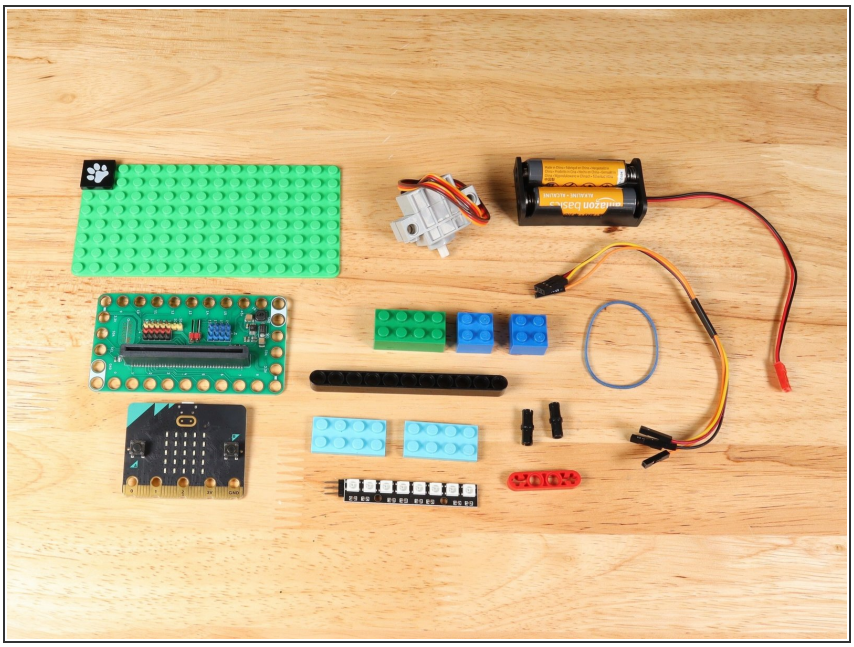
optional

- Computer (1)

PARTS:

- Crazy Circuits Bit Board (1)
- micro:bit (1)
- Addressable RGB LED Strip (1)
- Brick Compatible 270 Degree Servo (1)
- LEGO Baseplate (1)
- LEGO Bricks (1)
- Crazy Circuits Ribbon Cable (1)
- LEGO Beam 11 (32525 / 64290) (1)
- LEGO Pin without Friction Ridges (3673) (2)

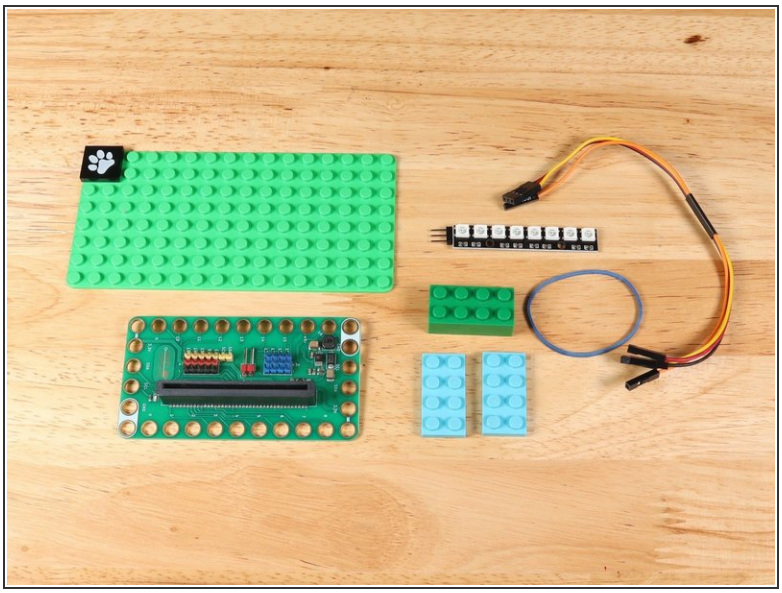
Step 1 — Gather Electronic Supplies

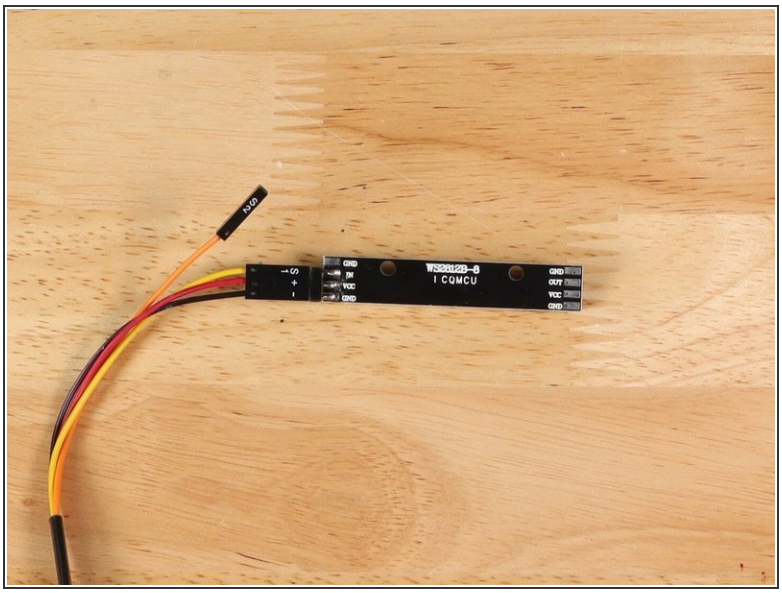


- Gather the supplies for the circuitry inside the Haunted House.

ⓘ The LEGO parts can easily be swapped for similar LEGO bricks/beams that you have on hand with minor adjustments to the layout.

Step 2 — Connect Ribbon Cable to NeoPixel Strip

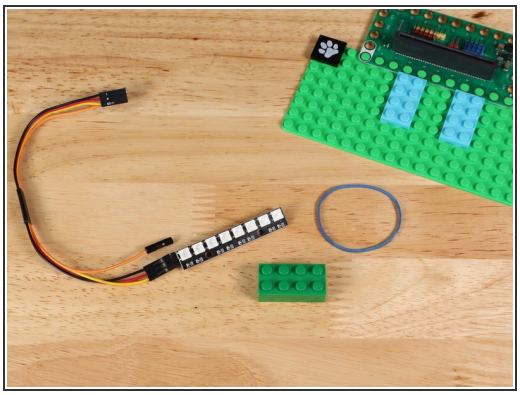
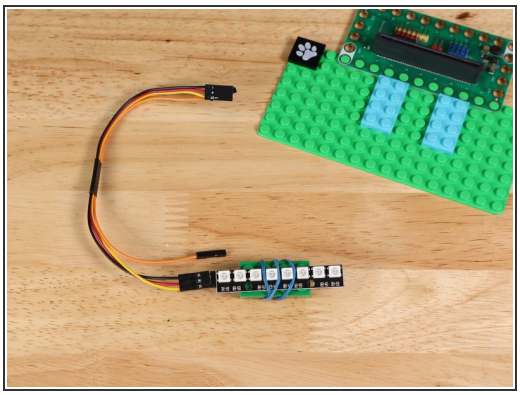
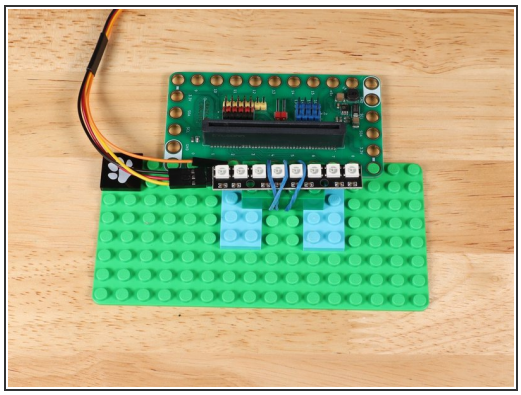




- To connect the NeoPixel Strip to the project you will need a Crazy Circuits Ribbon Cable, a rubber band, and some LEGO bricks.
- If you turn the **NeoPixel Strip** over you'll see labels for the three pins. You should see **IN**, **VCC**, and **GND**.
- Using the end of the Crazy Circuits Ribbon Cable with all four wires separate, connect **S1** to **IN**, **+** to **VCC**, and **-** to **GND**.

We only need three wires for the **NeoPixel Strip** so you can leave **S2** (the Orange wire) unconnected.

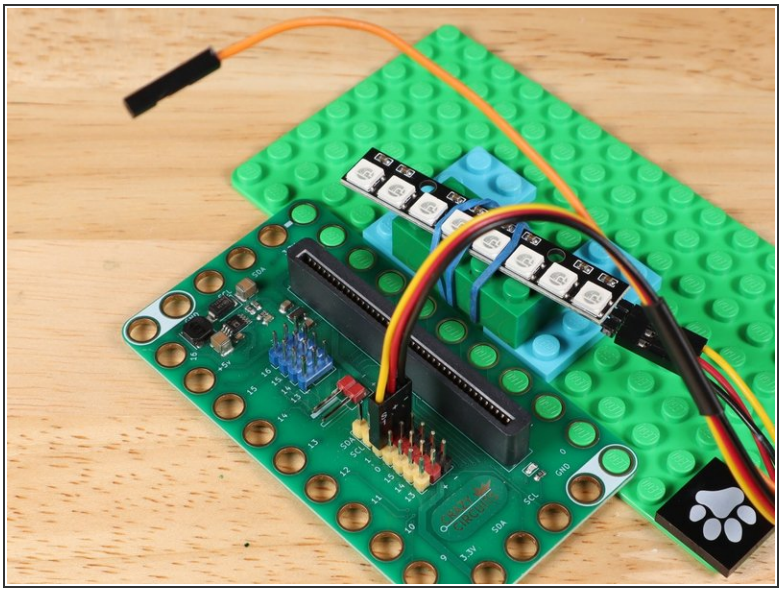
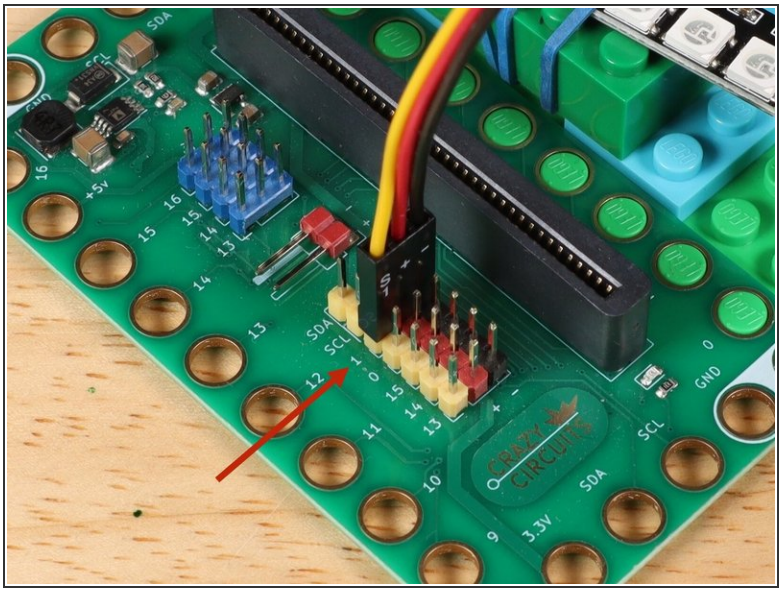
Step 3 — Secure NeoPixel Strip

- **Attach the NeoPixel Strip to a LEGO** brick with a rubber band.
- **Connect the brick** to a couple other LEGO parts **on the baseplate** so the rubber band doesn't get in the way.

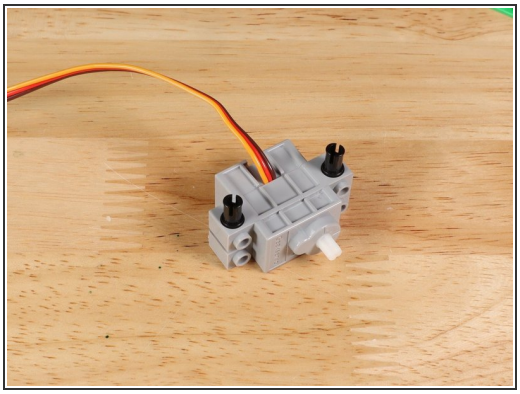
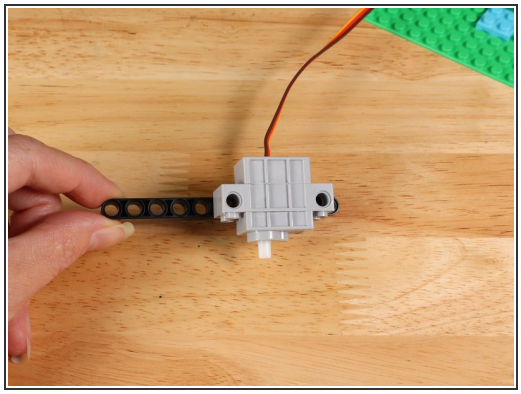
ⓘ Placement of the bricks and NeoPixel Strip can be adjusted based on your desired needs.

Step 4 — Connect NeoPixel Strip to Bit Board

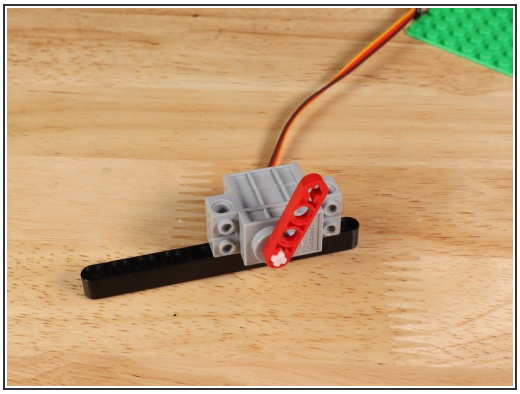
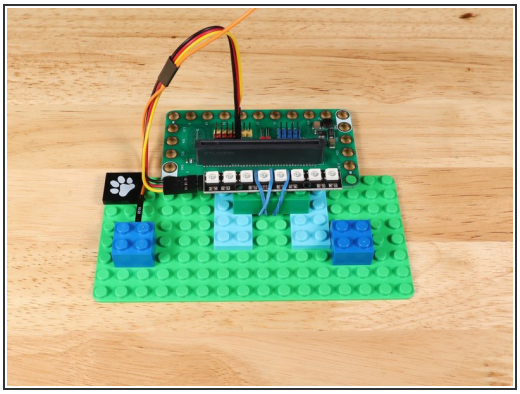
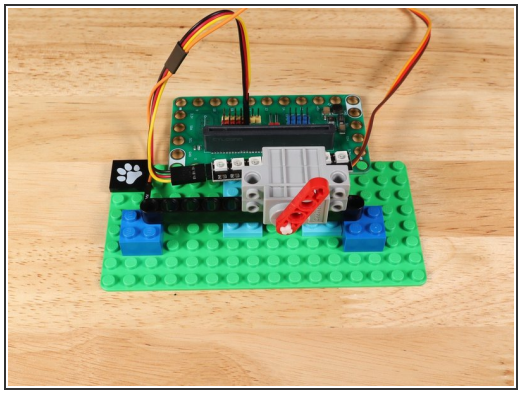
- The end with **S1**, **+**, and **-** can plug directly into the **Pin 1** row (make sure **S1** goes into **1**).
- We only need three wires for the **NeoPixel Strip** so you can leave **S2** (the Orange wire) unconnected.

Step 5 — Attach Servo to Beam

- Insert **two black pins** on the side of the servo where the wires connect.
- **Connect the servo** to a **LEGO technic beam** with the wires at the bottom. In this guide we used an 11-hole long beam. You can also use a different size and modify accordingly.

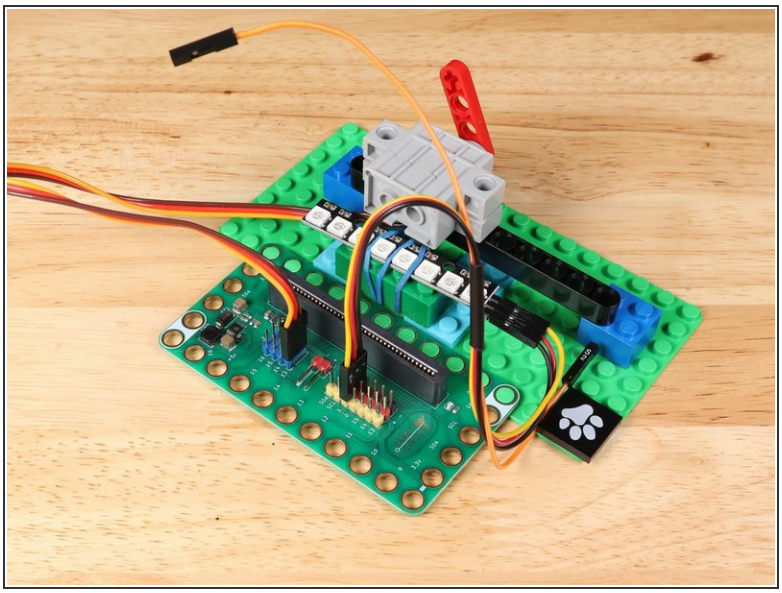
Step 6 — Connect Servo to Baseplate

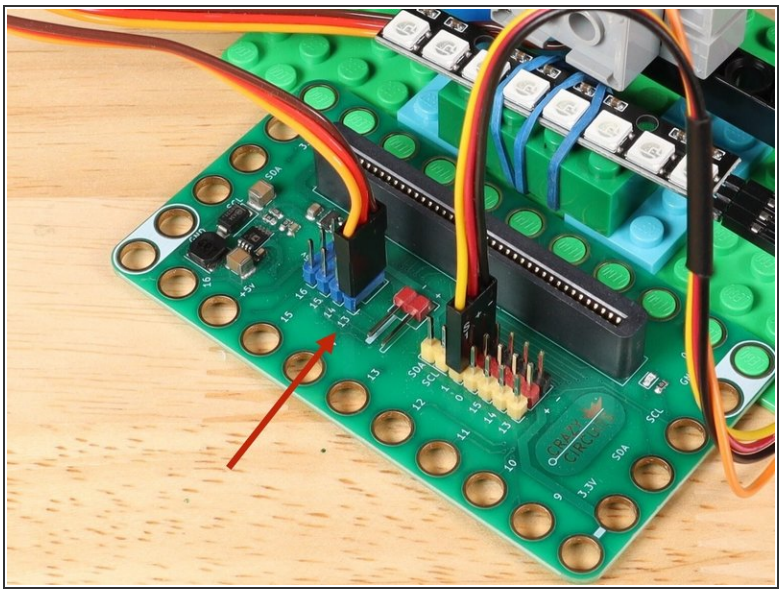




- Attach a **LEGO half beam with axle holes** onto the **shaft of the servo**. The ghost will be taped onto this in a later step.
- Using some bricks, **connect the beam** with servo attached **to the baseplate**.

ⓘ You can adjust the placement of the beam on the shaft, servo on the beam, and beam on the baseplate to make the assembly line up the way you want.

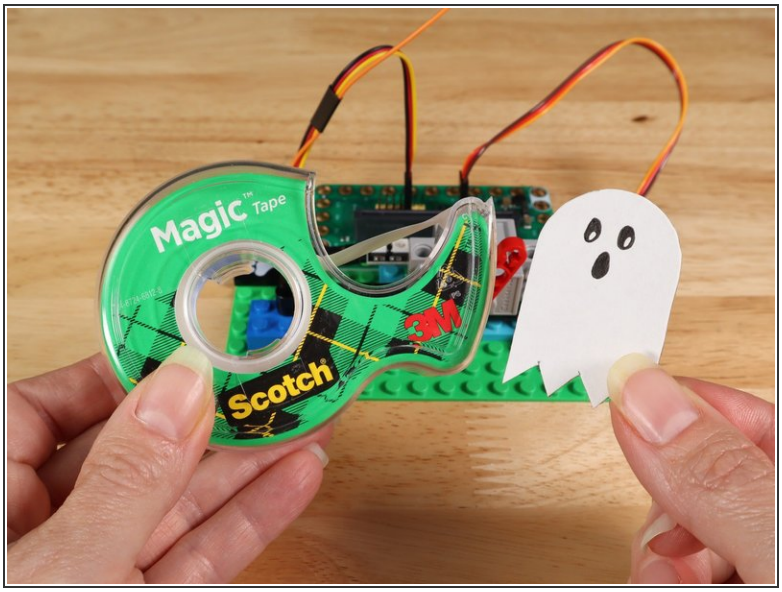
Step 7 — Connect the 270˚ Servo

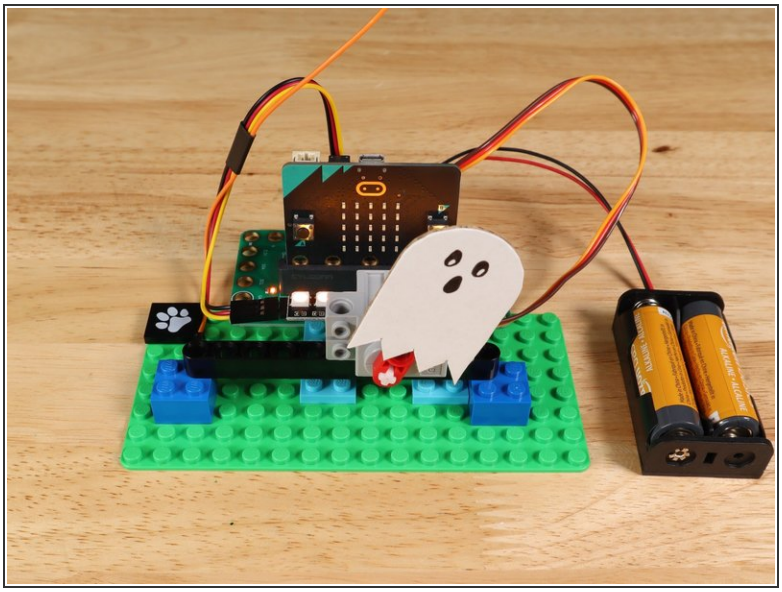




- The **270 Degree Servo Motor** has a 3-wire connector on the end that can plug directly into the pins on the back of the Bit Board.
- The Blue Pins on the Bit Board provide extra power (5 volts instead of 3 volts) by **boosting the voltage** coming from the battery pack. This helps improve servo performance, especially with multiple servos.
- Make sure the **Orange Wire** is closest to the number **13** for the **Pin 13** column.
- Then the **Brown Wire** should be closest to the micro:bit (in the **-** row) and the **Red Wire** will be in the middle (the **+5v** row).

Step 8 — Attach Ghost

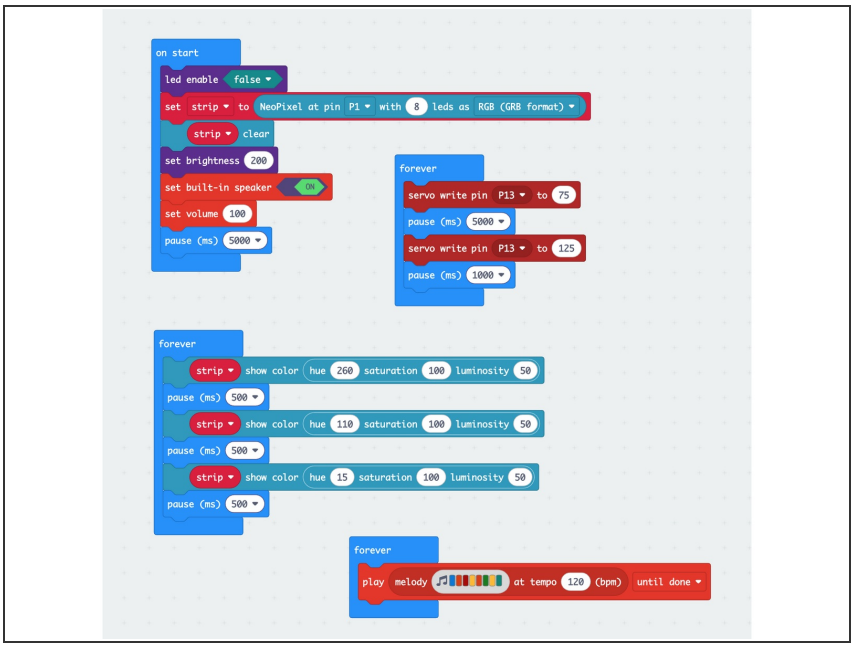




- **Cut out the ghost** from the template or make your own.
- **Attach the ghost** to the half beam on the servo using tape.

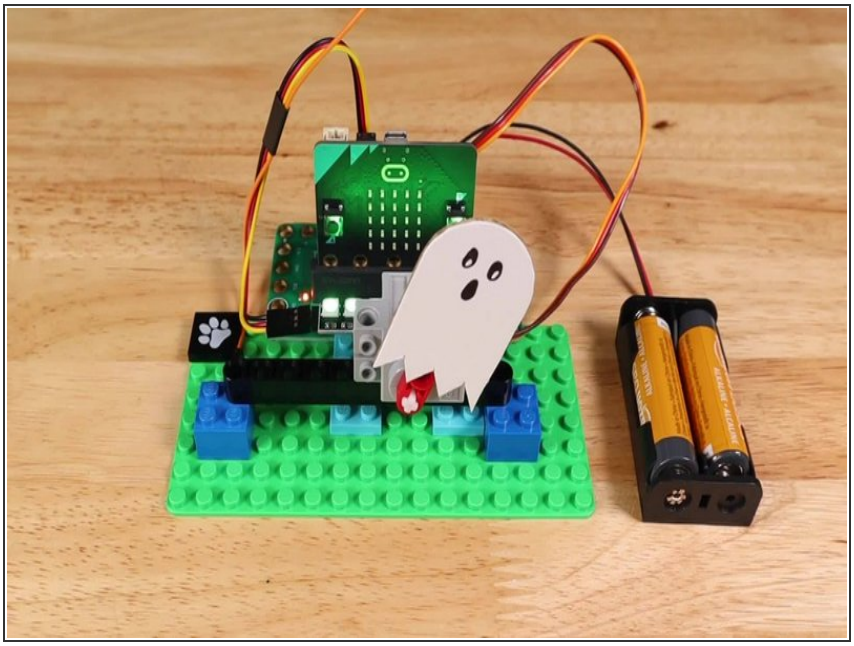
ⓘ Once code is added to your build, the placement of the half beam on the servo may need to be adjusted. You can simply pull the beam off the shaft and reconnect it once the servo is oriented correctly.

Step 9 — Load the Code



- If you've never used a micro:bit before you'll want to check out this guide: Bit Board V2 Setup and Use
- We're going to load the following code for our **Haunted House**: https://makecode.microbit.org/S57411-058...

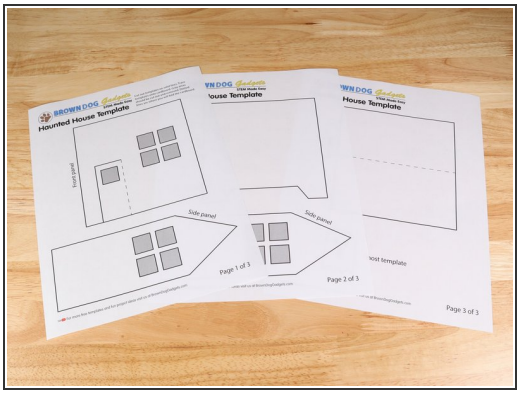
Step 10 — Test the Code

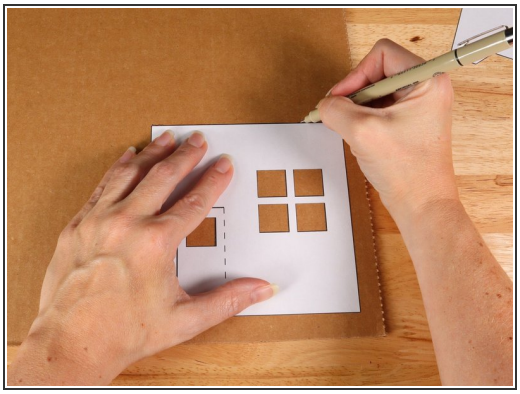


- Once the code is loaded onto the micro:bit and power is supplied to the project there will be a 5 second delay.
- After the delay, music will begin to play directly from the onboard speaker, the NeoPixel Strip will rotate through 3 colors, and the servo will switch between two distinct positions.

ⓘ You can modify the code in many different ways to meet your needs. Some options for modifications are the colors on the NeoPixel, the music playing, or the pauses for servo.

Step 11 — House Template






- Cut out the template parts.
- There are two different ways that we have found helpful when cutting out the house parts:
  - You can trace the template parts onto the cardboard with a pen or marker.
  - You can also tape the template right onto the cardboard and cut around the edges of the template.

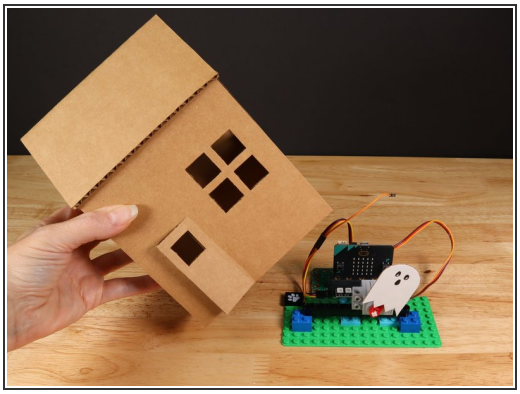
Step 12 — Cut Sections and Assemble House

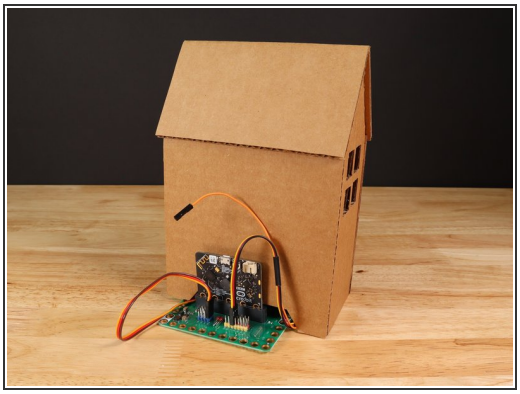




- Carefully **cut** out all 5 panels for the house and **assemble** using hot glue.

Step 13 — Place Haunted House Over Baseplate

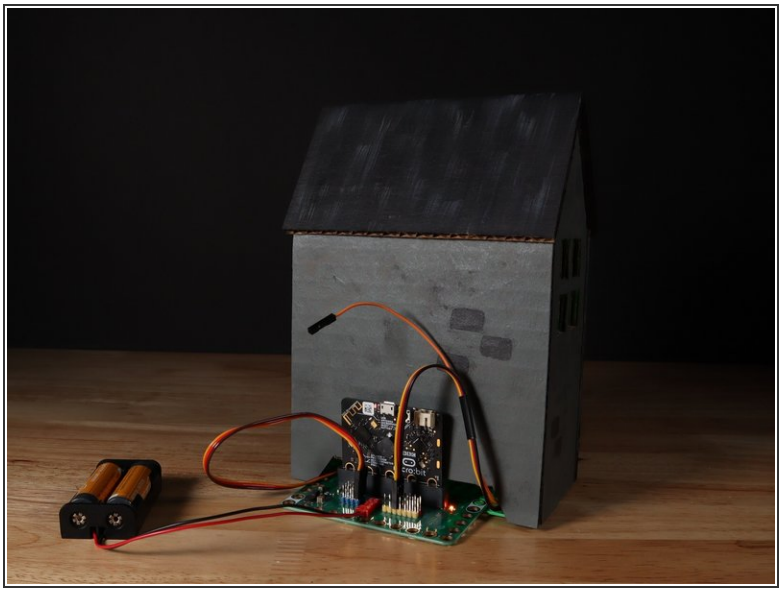




- The house should fit around the perimeter of the baseplate.
- You may need to adjust the wires so they fit under the back panel of the house.
- The micro:bit and Bit Board will be on the outside of the Haunted House in the back.

ⓘ If you can't see the ghost through the window or door adequately, you can change the location of the servo on the beam as a quick adjustment.

Step 14 — Decorate Your Haunted House

- Use paint, markers, or colored pencils to **decorate your Haunted House**!

ⓘ The inside of the Haunted House is not painted. The brown of the cardboard is a great backdrop for the different colors we are using on the NeoPixel Strip.

Step 15 — Display Your Haunted House!



- Show off your Haunted House with spooky pride!