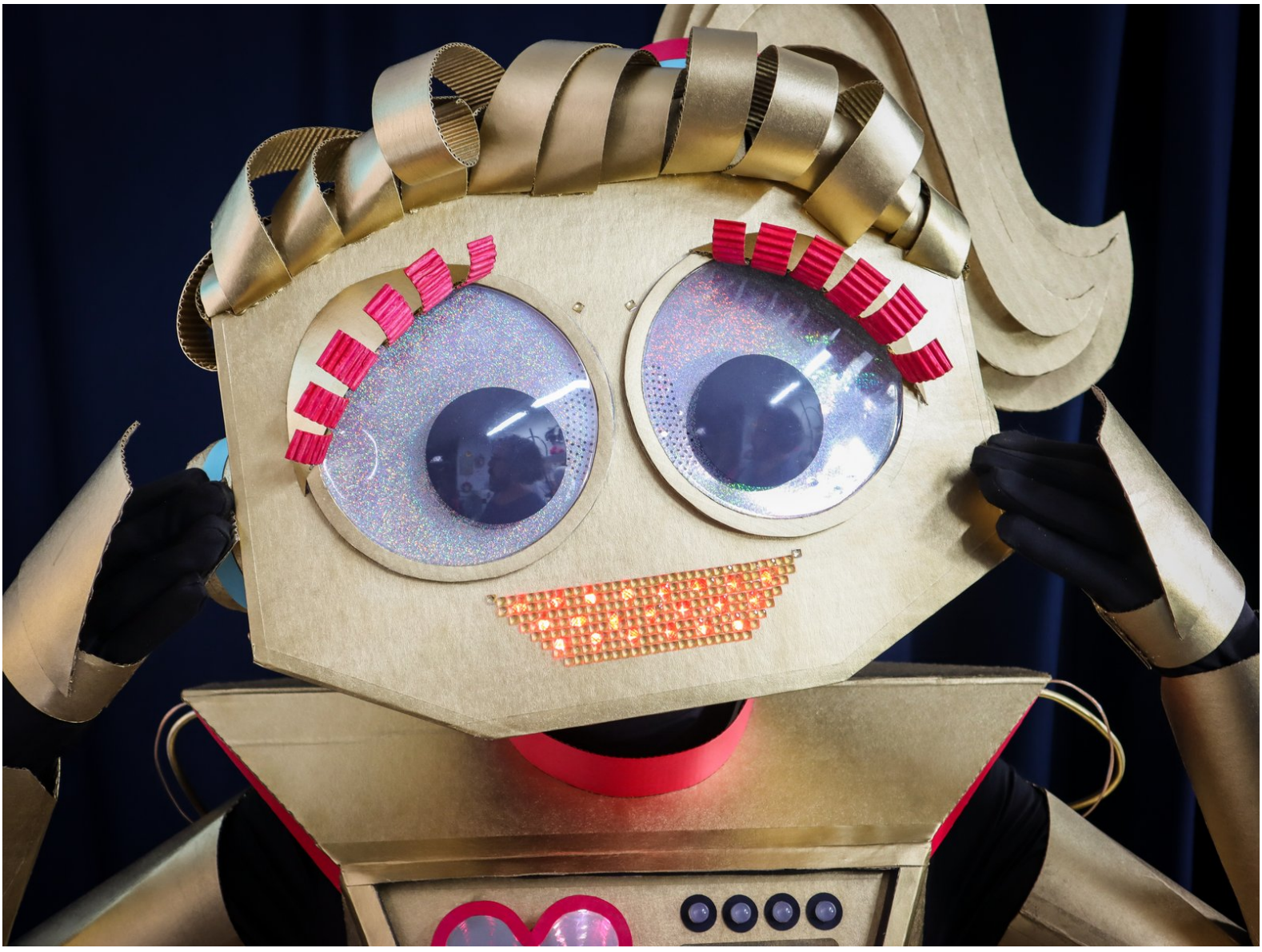
Really Robotic Robot Costume - Robotic Googly Eyes

Googly eyes are the best - but we made them better! This tutorial shows you how to make googly eyes that are controllable by simple servo motors.

Written By: Natasha Dzurny



INTRODUCTION

Meet Sally Servo - the Really Robotic Robot. :)

In this tutorial, you'll learn how to make robotic googly eyes like Sally's. Googly eyes are the best - but we made them better! This tutorial shows you how to make googly eyes that are controllable by simple servo motors. This is an easy project and a great introduction to micro:bit with a big impact!

TOOLS:

- Utility Knife (1)
- Hot Glue Gun (1)
- Scissors (1)

PARTS:

- Crazy Circuits Bit Board (1)
- micro:bit (1)
- Extra Large Googly Eyes (1)
- Black Paper (1)
- Glitter Cardstock (1)

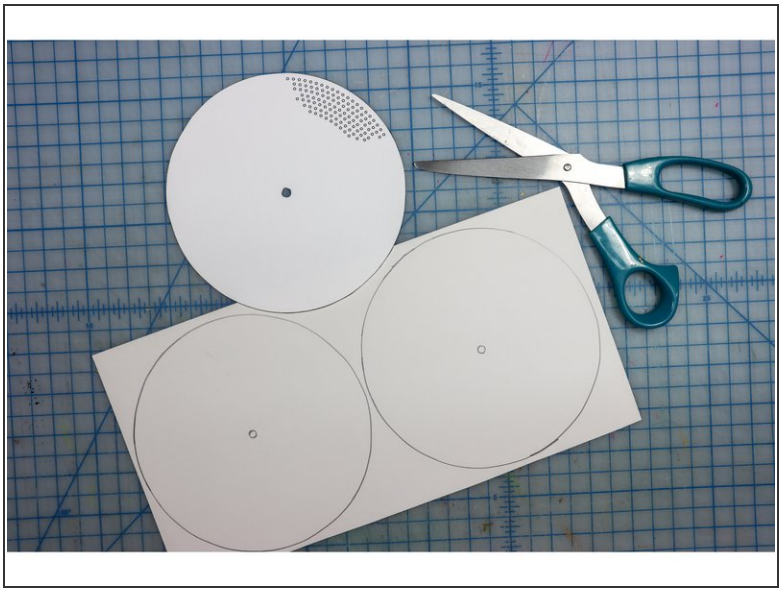
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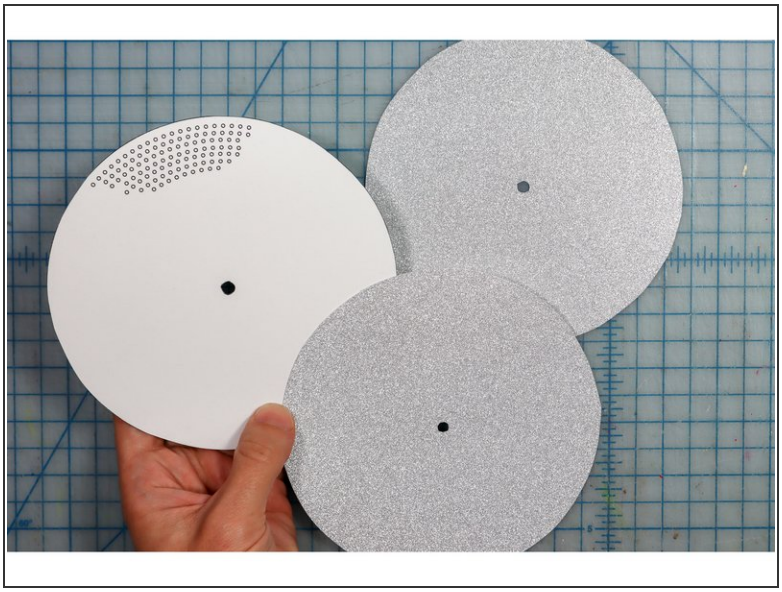
Step 1 — Gather Supplies



- Gather supplies. You will need a pair of extra-large googly eyes. If the size of your eyes is different from the template, enlarge or reduce the size of the large circle to match.

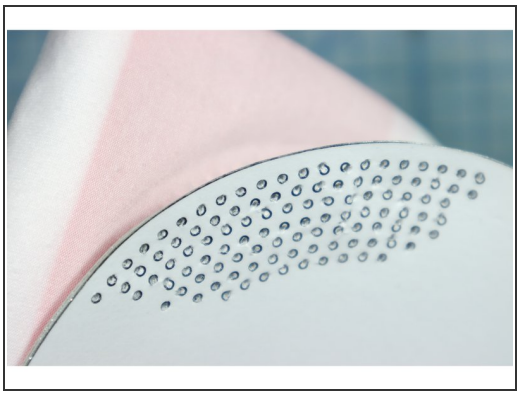
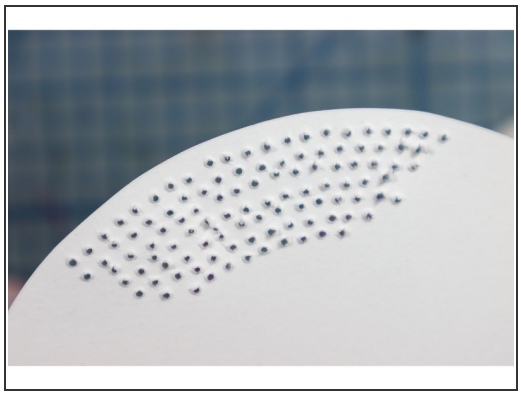
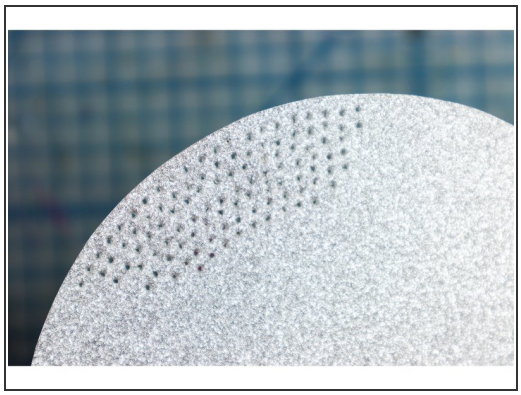
Step 2 — Cut out the large circles





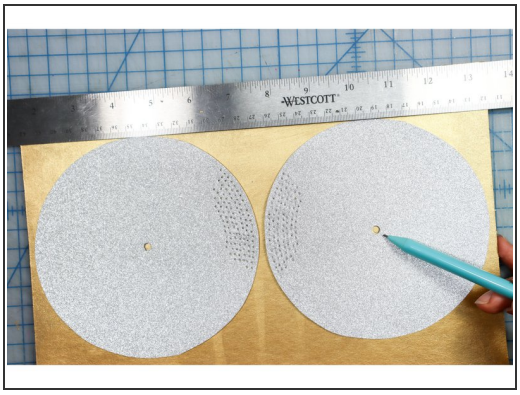
- Cut out the large circles from glitter paper.
  - We've found that the shinier/glitterier the paper, the better the eye holes are hidden. This way, you can see out of the mask while hiding the eye holes!

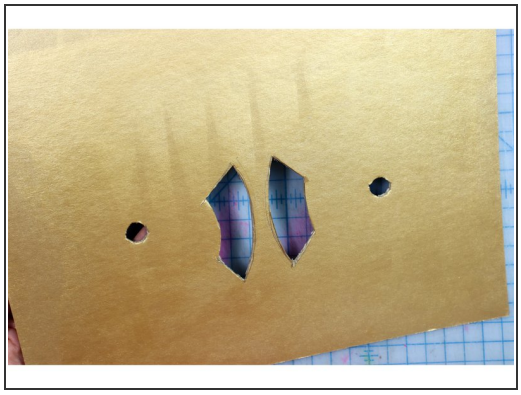
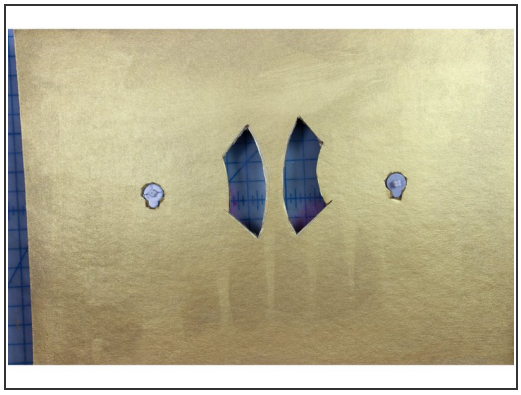
Step 3 — Poke the tiny holes

- Using an awl, poke out all the tiny holes according to the template. To make it easier, use an old piece of cloth under the paper to allow the awl more room to move through.

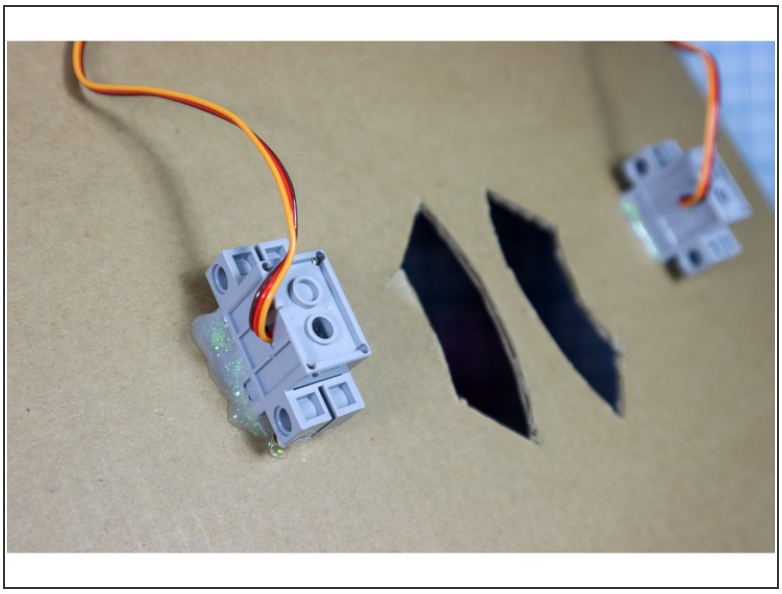
Step 4 — Mark & cut the eye locations

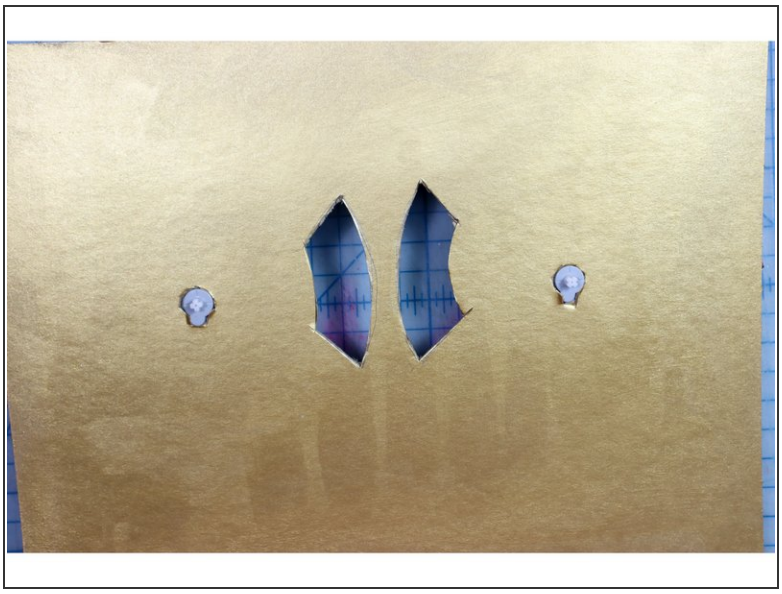


- Place the large circles onto the cardboard where the eyes will go. Mark the center of the circles and also the location of the tiny holes.
- Cut out the section under the perforation holes. Make sure you don't cut too far outside the area so that the eye pieces cover the hole completely.
- Cut holes for the motors to go through. The center is about 1/2 inch, and a small notch needs to be cut from the bottom to account for the shape of the plastic, as shown.

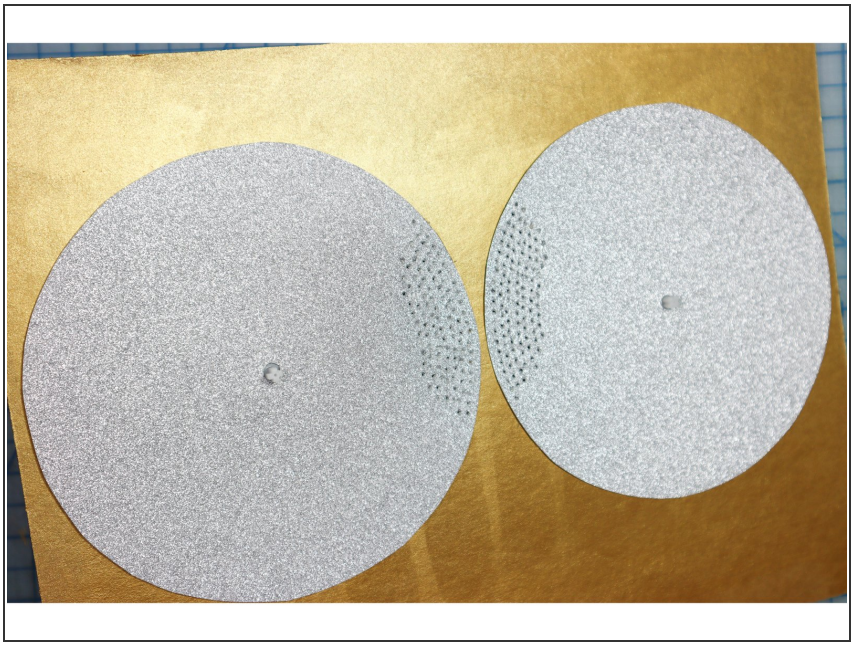
Step 5 — Glue the motors in place





- Glue the motors in place from behind. Both motors should be facing the same direction. This will make the angles easier to code.

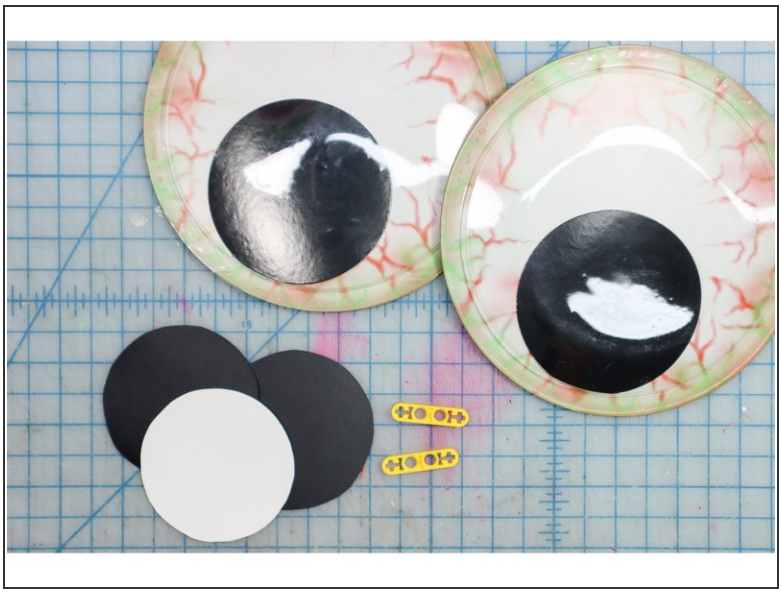
Step 6 — Glue the pieces

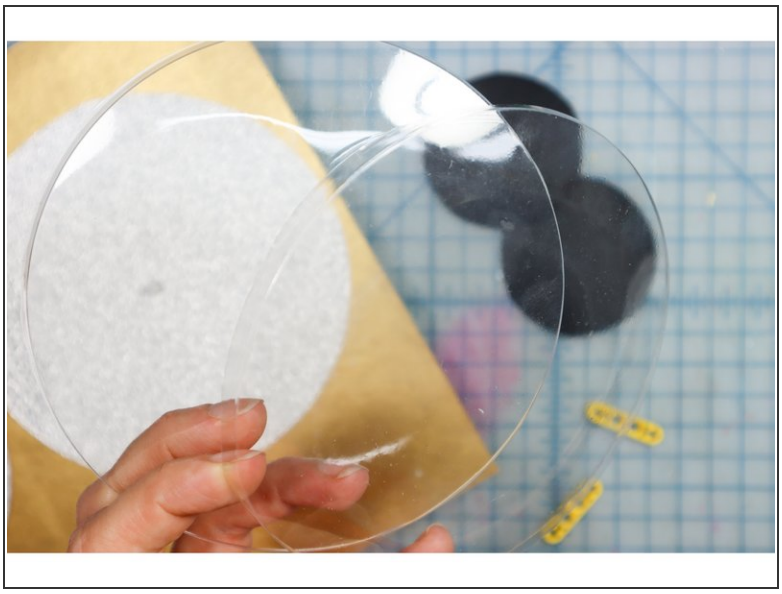


- Glue the eye pieces in place, aligning the holes with the cutouts.

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Step 7 — Prepare the eye balls

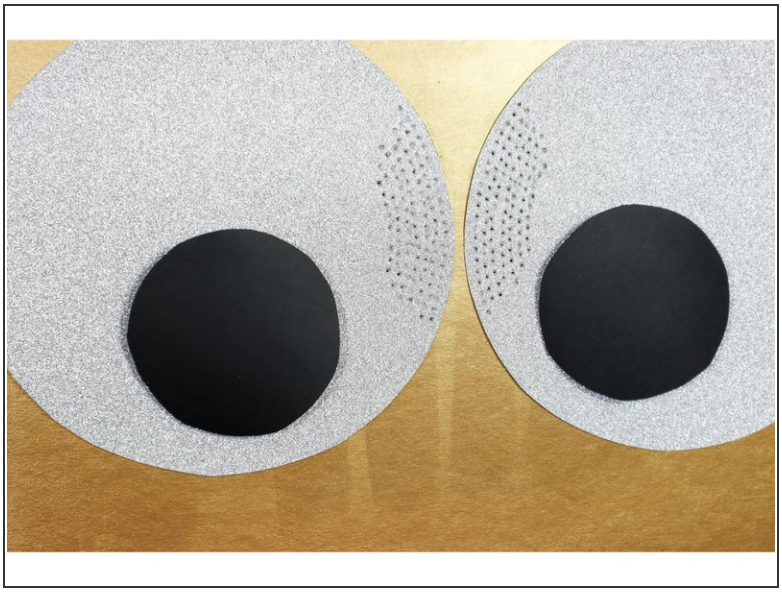




- Cut the small circles from black paper (or reuse the pupils from the large googly eyes.)
- Remove the plastic covers from the googly eyes. Discard the backing.

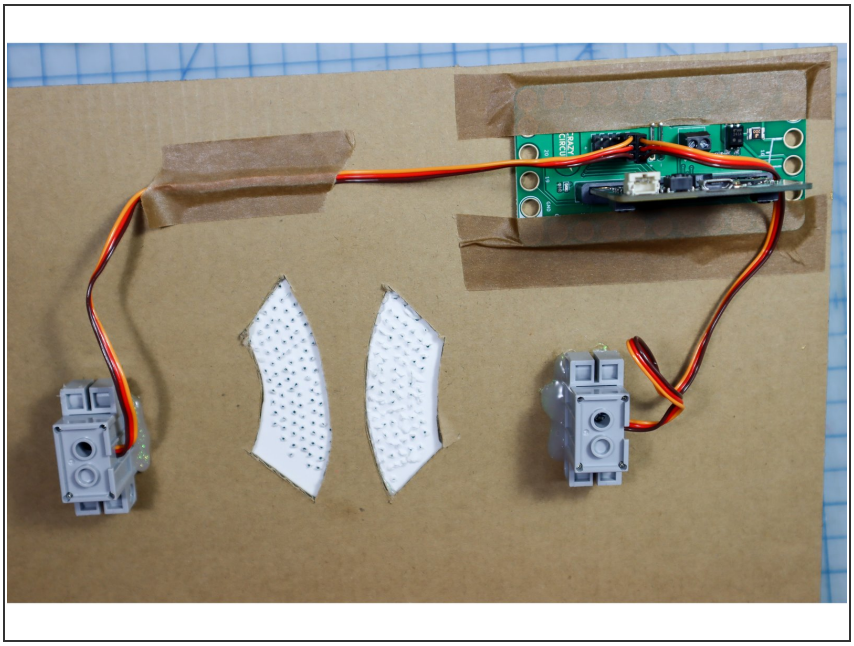
Step 8 — Glue the motor heads





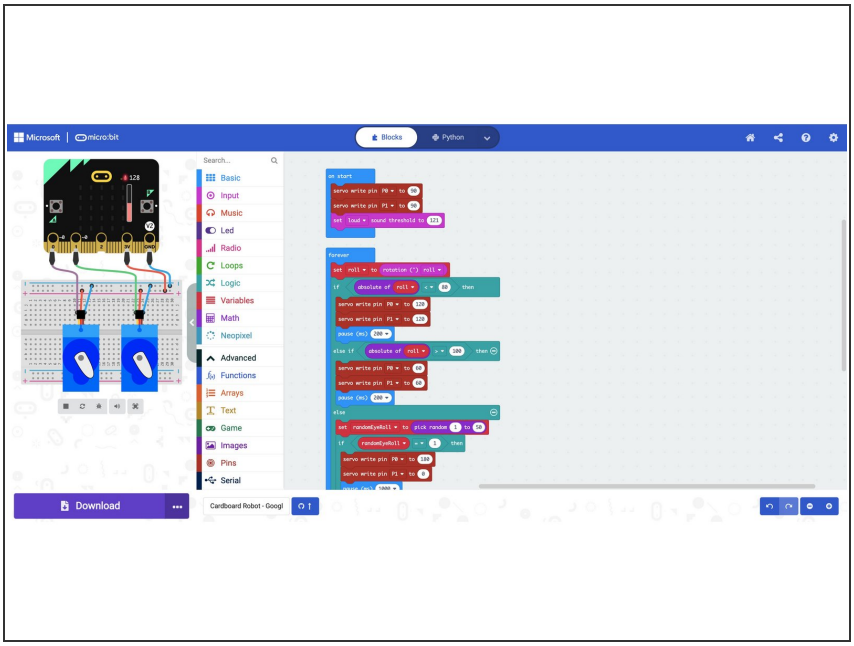
- Hot glue the LEGO pieces to the pupils as shown with the "+" part at the edge.
  - Tip: Avoid getting glue into the "+" area near the edge so that the motor head will fit inside.

Step 9 — Connect the Circuit



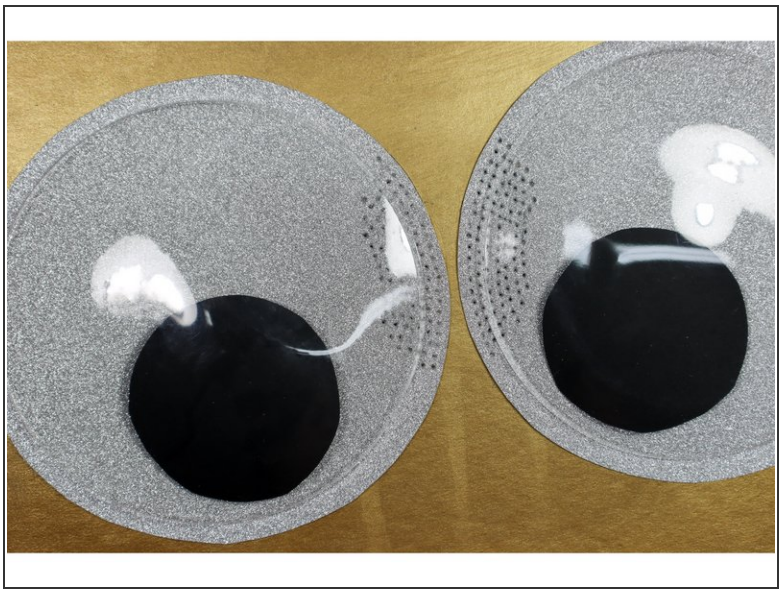
- Connect the motors to Pin 0 and Pin 1 on the bit board.
- Connect the micro:bit.

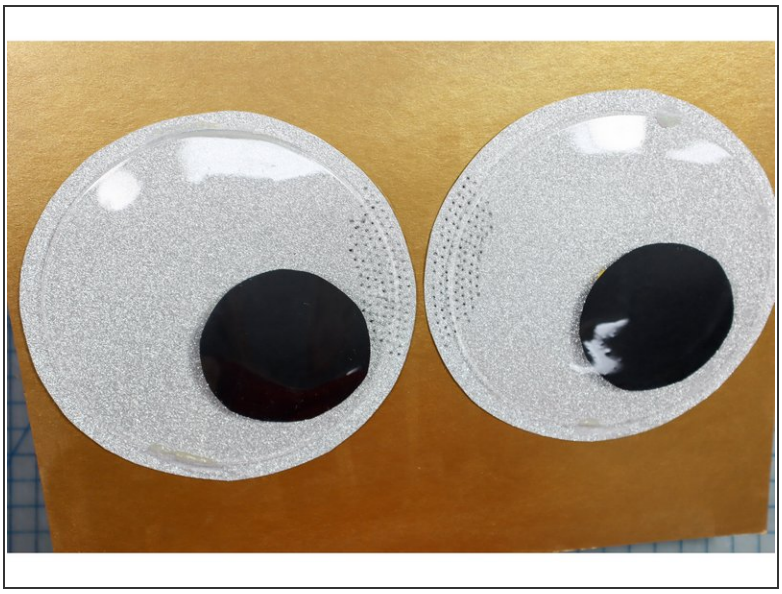
Step 10 — Code the micro:bit



- Download the code to micro:bit, available here.
- This code moves the eyes when the head is tilted, and randomly rolls the robot eyes for dramatic effect.

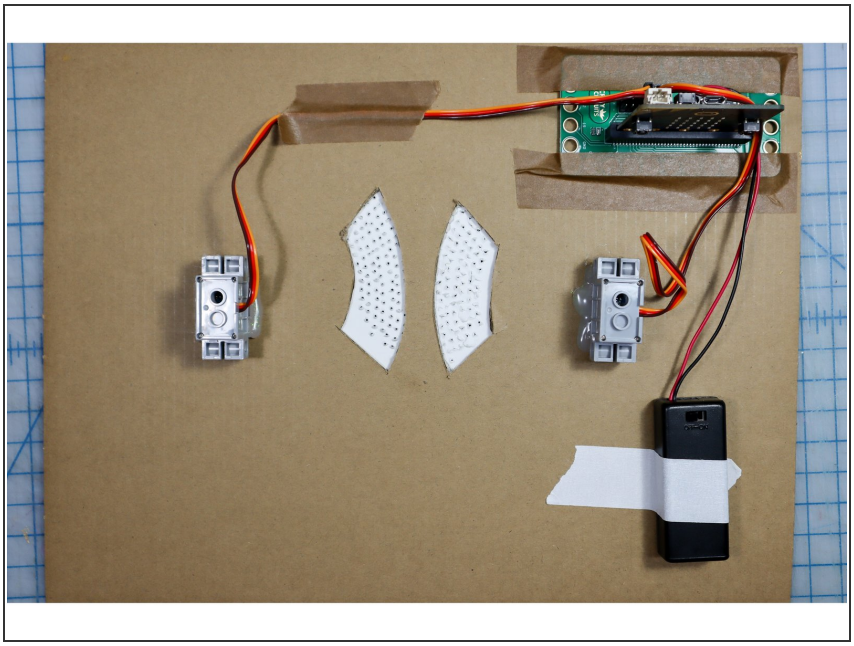
Step 11 — Place the pupils





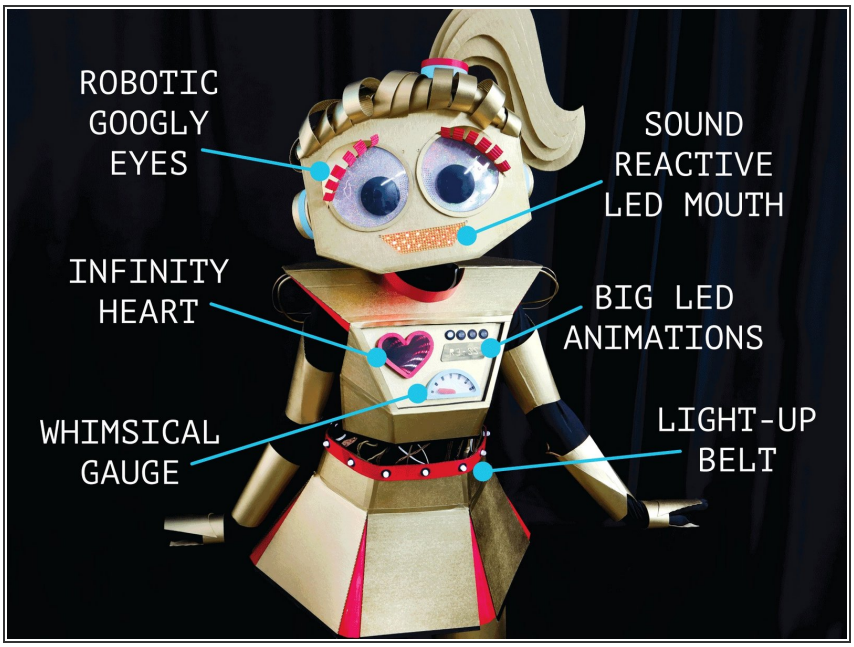
- Place the pupils on the eyes and test the code. Be sure that the pupils are attached to the motors at the correct angle.
- Once the pupils are correct, glue the plastic domes over the eyes.

Step 12 — Add a Battery Pack



- Add a battery pack to make the project mobile.

Step 13 — Create the rest!



- Continue to build your Really Robotic Robot costume! For more, view these guides:
  - LED Belt
  - LED Light Animations
  - Whimsical Robot Gauge
  - Infinity Mirror Robot Heart
  - Sound Reactive Robot Mouth