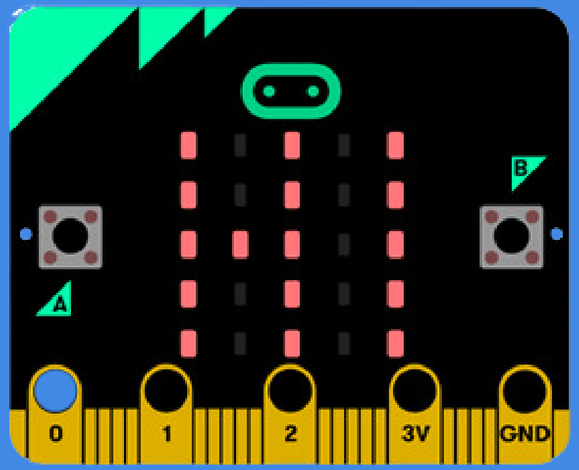


Micro:Bit Mind

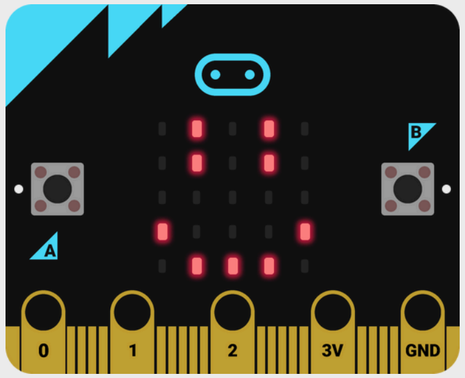
When Learning Meets Micro:Bit

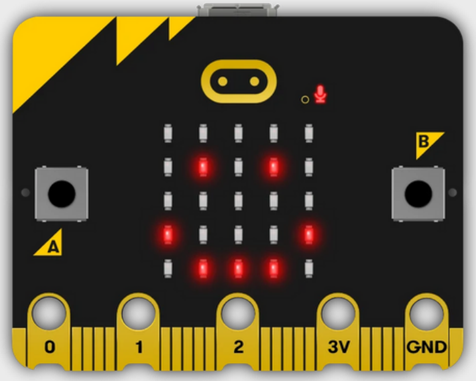
ALIGNMENT

New To Micro:Bit?

The micro:bit is a tiny computer that makes coding tangible and promotes digital creativity.

If you are new to Micro:bit, I made a Micro:bit learning book for makers. The activities in the learning book are specifically designed to help learners practice and comprehend how Micro:Bit works, based on its features and functions.





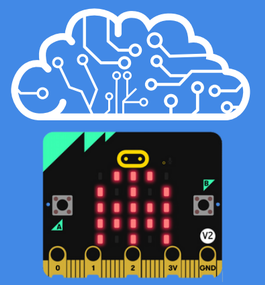
V1 Learning Book

V2 Learning Book

ALIGNMENT

Project Ideas

When Learning meets Micro:Bit



Artificial Intelligence



Robotics



Storytelling



Math



Kindness Project



MakerEd

ALIGNMENT

Give Your Micro:Bit AI Super Power

AI & Micro:Bit

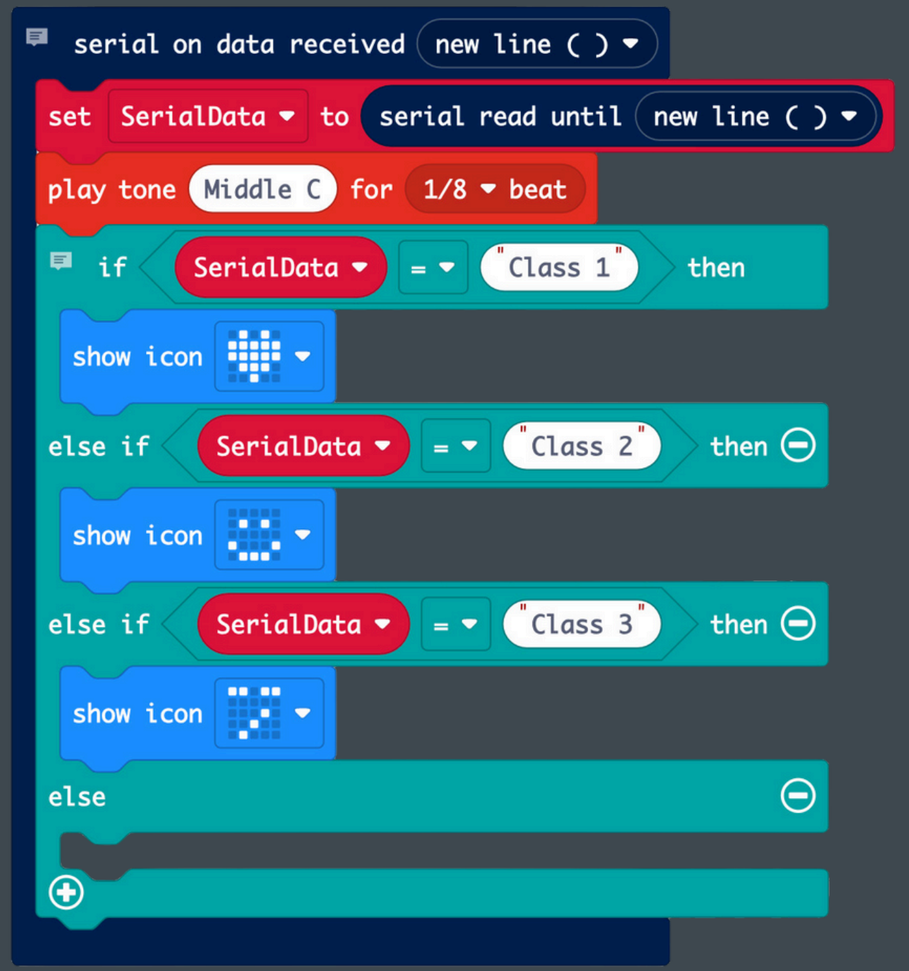
Access Make:AI Robots site

1. Google Teachable Machine AI Model

2. Starter micro:bit code

3. Connect your micro:bit to your AI!

https://makeairobots.com/



How it looks like in MakeCode:
Your data will be categorized by a few classes so Micro:Bit can react based on the date you input.

ALIGNMENT

Color Indicator

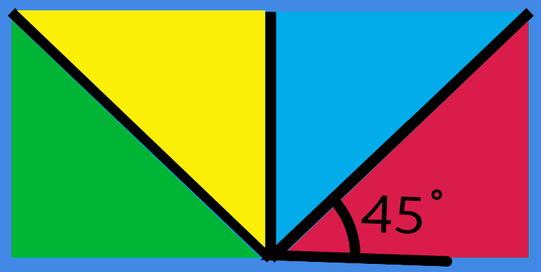
Use micro:bit and AI to create a color indicator that helps people who struggle to recognize colors by giving real-time feedback and making it easier to distinguish between colors.

1 Angle Calculation

We split the cardboard into four parts to display four colors. We use a positional servo (180) to ensure that each section is at a 45 degree angle.



Positional servo (0-180 deg)



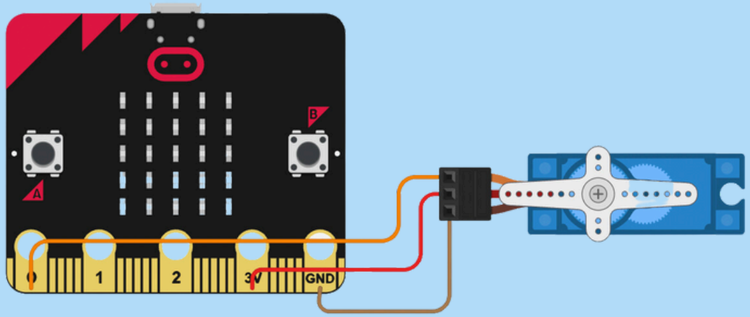
Red: 22.5°

Blue: 67.5°

Yellow: 112.5°

Green: 157.5°

2 Physical Setup



Connect to Pin 0



ALIGNMENT

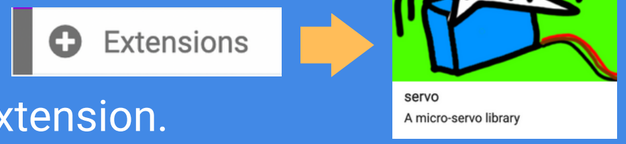
3 Code

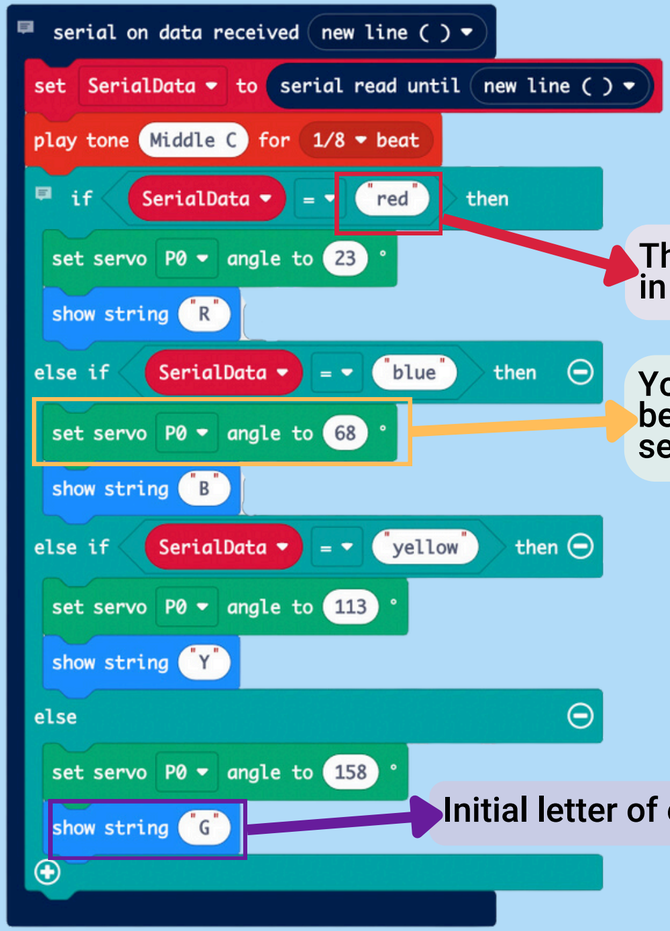
Step 1:
Create an image recognization model via Google Teachable Machine Site.

Step 2:
Go to the provided MakeCode Starter to adjust the code. The class names should be aligned with your AI model.

Step 3:
Follow instructions on Micro:Bit AI site and connect to your AI models.

Step 4:
Add ‘Servo’ extension.







The names should be the same with class names in your AI models.

You need to add the servo extension. Angles have been calculated based on four different color sections.

Initial letter of each color showing on Micro:Bit

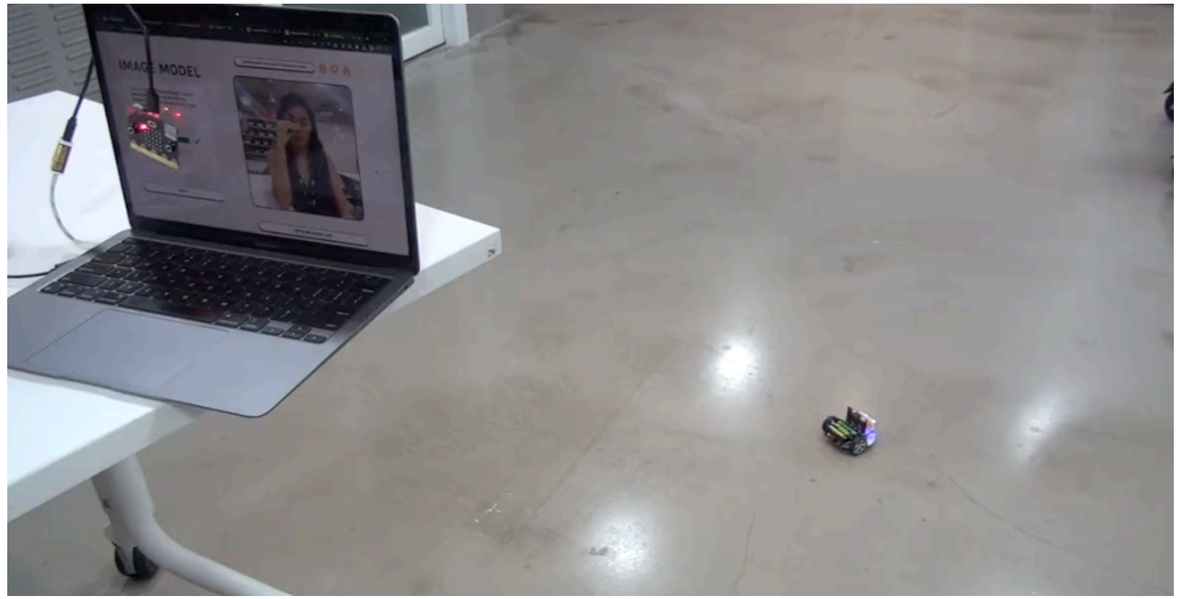
Artificial Intelligence

AI-Controlled Car

Project Intro

Using AI with the Micro:bit and Cutebot, this project translates sign language into actions. Signing "food" directs the car to move left, while "drink" makes it move right. This innovative use of technology creates meaningful interactions, showcasing the potential of AI in educational and assistive applications.

Setup:



Project Overview

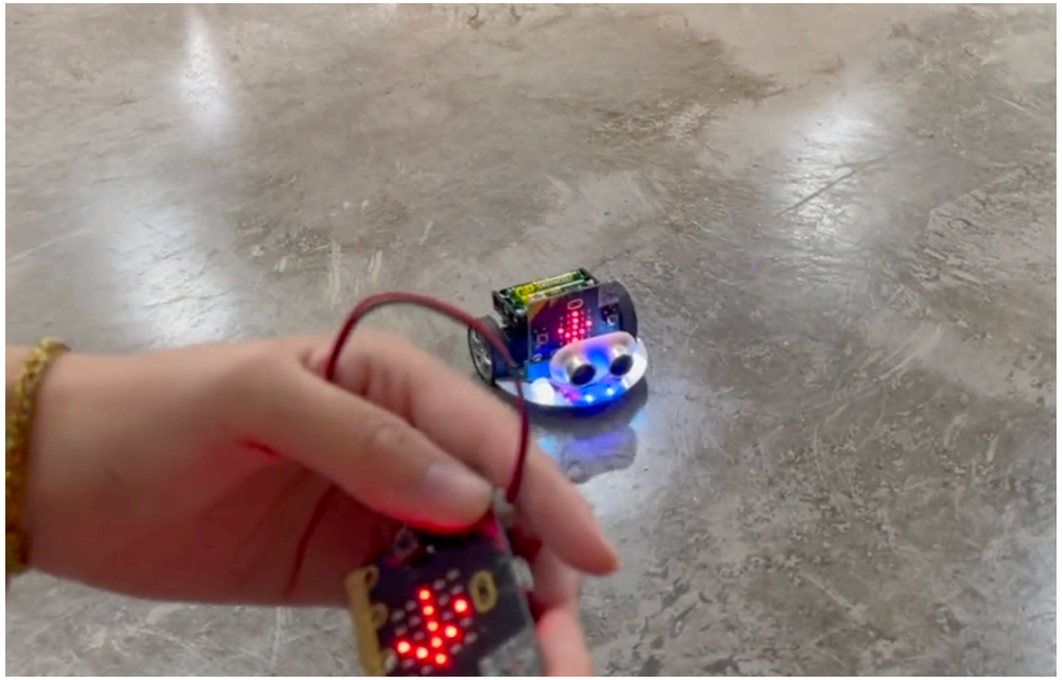
Robotics

Remote-Controlled Car

Project Intro

I developed a remote-controlled vehicle using the Cutebot and Micro:bit.
The car is operated with buttons and resistive pins, incorporating angle calculations for control. This project offers an engaging way to integrate math into tech education, highlighting the fun of hands-on learning with Ed Tech.

Setup:



Project Overview

ALIGNMENT



Light-Controlled Car

Project Intro

Using the Micro:bit's built-in sensor, the robot responds to light to perform different motions. I plan to develop it into a drawing bot for my Year 8 math class, showcasing innovation in Ed Tech.

Setup:



Project Overview

Storytelling

Interactive LED Art

Project Intro

I transformed a student's painting into interactive urban art that responds to movement. The LEDs change color based on the angle of the artwork. I'm excited for all students to use Micro:bit and elevate their paintings with this creative technology.

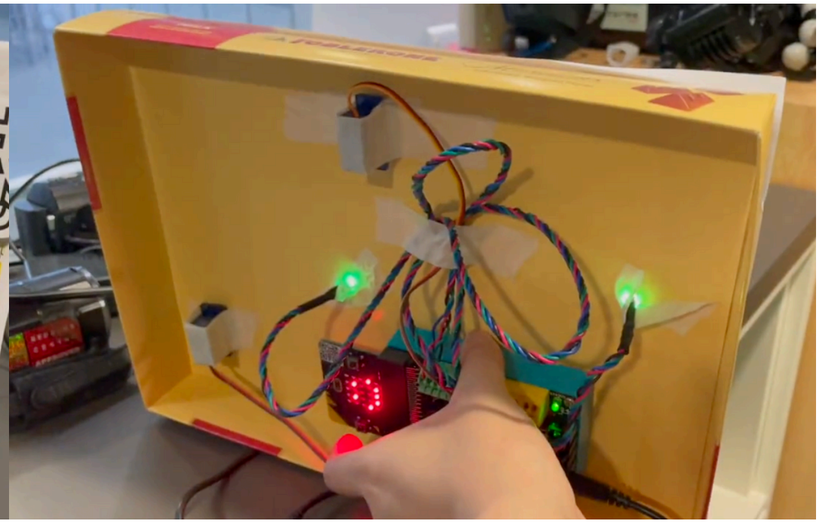


HummingBird:Bit

Setup:



Front Setup



Back Setup

Project Overview

ALIGNMENT

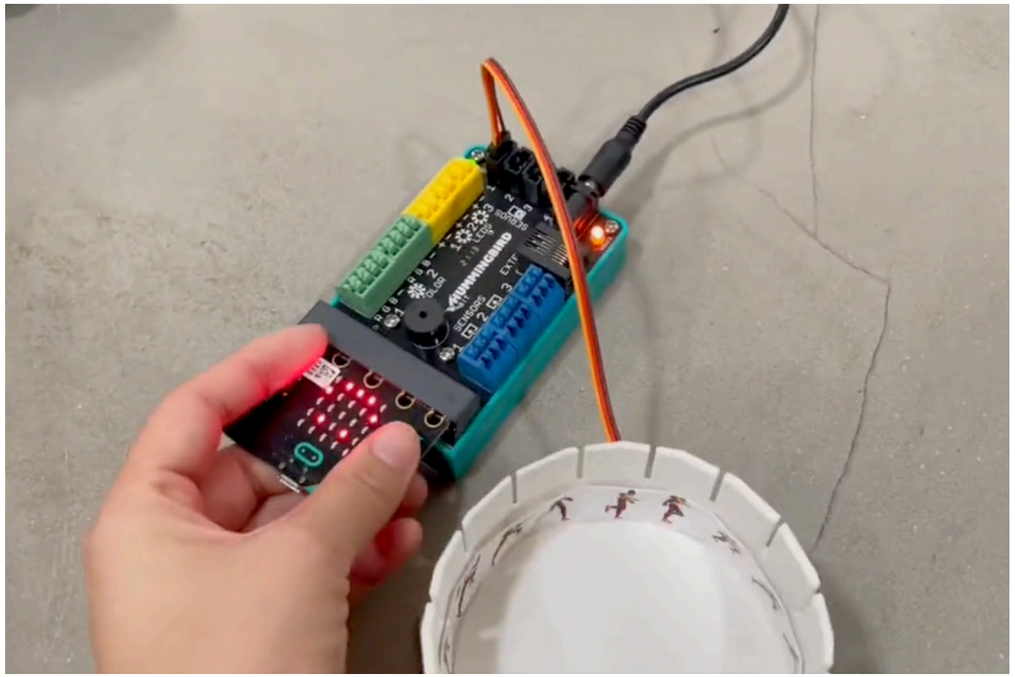
Spinimation

Project Intro

This project involved creating a praxinoscope using Tinkercad, Micro:bit, and BirdBrainTech. It was exciting to see the pictures come alive as animation. This could be a new innovation for art lessons!

Platform/Tool Need For This Project

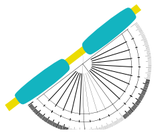
Setup:



Project Overview

ALIGNMENT

Math

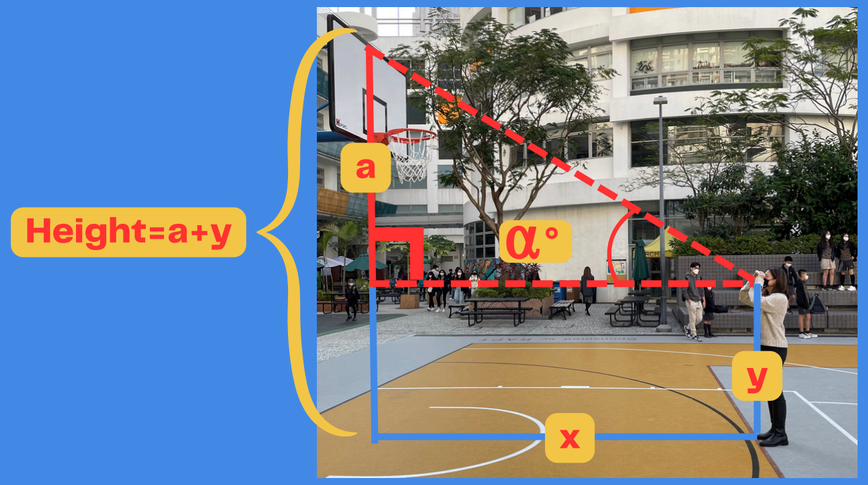


Clinometer

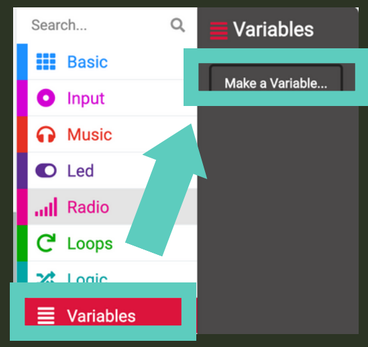
A clinometer is a tool that is used to measure the angle of elevation, or angle from the ground, in a right - angled triangle.

1 How it works

The micro:bit has a part called the accelerometer that can check how the micro:bit is moving. In this project, micro:bit senses the angle of rolling and show the angle on the LED screen.

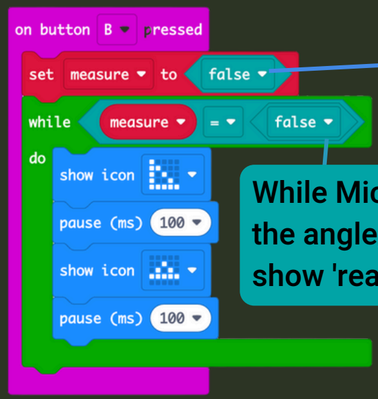


2 Code



Create two variables named 'measure' and 'dataLog'.





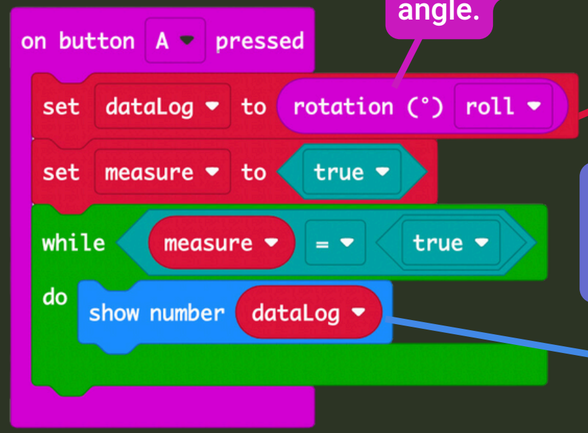
Use measure to define Micro:bit is NOT measuring the angle.

While Micro:bit is not measuring the angle, it has the animation to show 'ready to measure'.



Those two icons show up on the LED screen with 100 ms intervals.

Use measure to define Micro:bit is measuring the rolling angle.



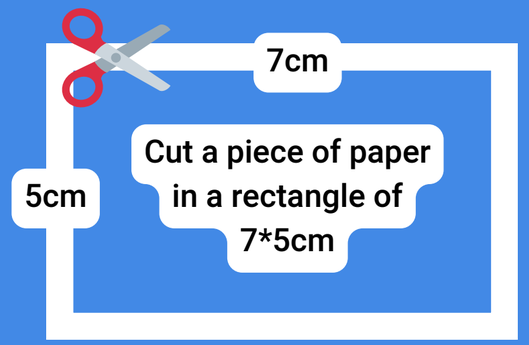
Set the dataLog value as the rolling angle of Micro:bit.

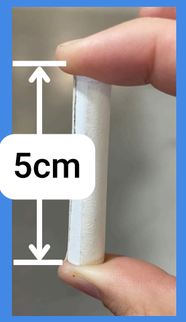
Every time when button A is pressed, the angle will be recorded by Micro:bit and you can retrieve the data later.

While Micro:bit is measuring the angle, it shows the number of the angle.

ALIGNMENT

3 Make a lens and assemble

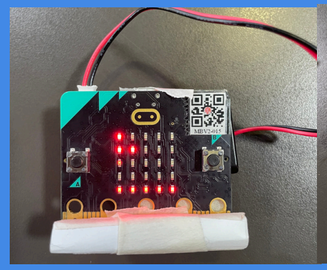




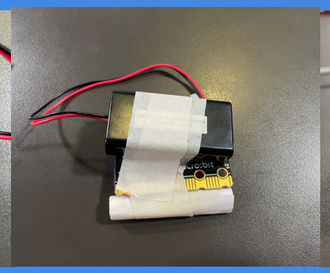
Make it a paper roll.
Tape it with masking tape.

Use masking tape to tape the paper roll on top of the pins.
Tape the batter pack with micro:bit.

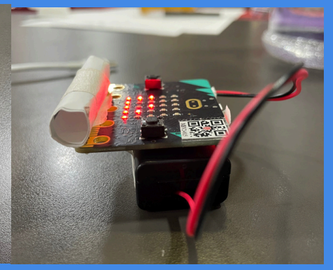
Front



Back



Side



4 Record Your Data



Get a pencil and paper ready, and record your measurement.

Target	X	Y	Angle

Math

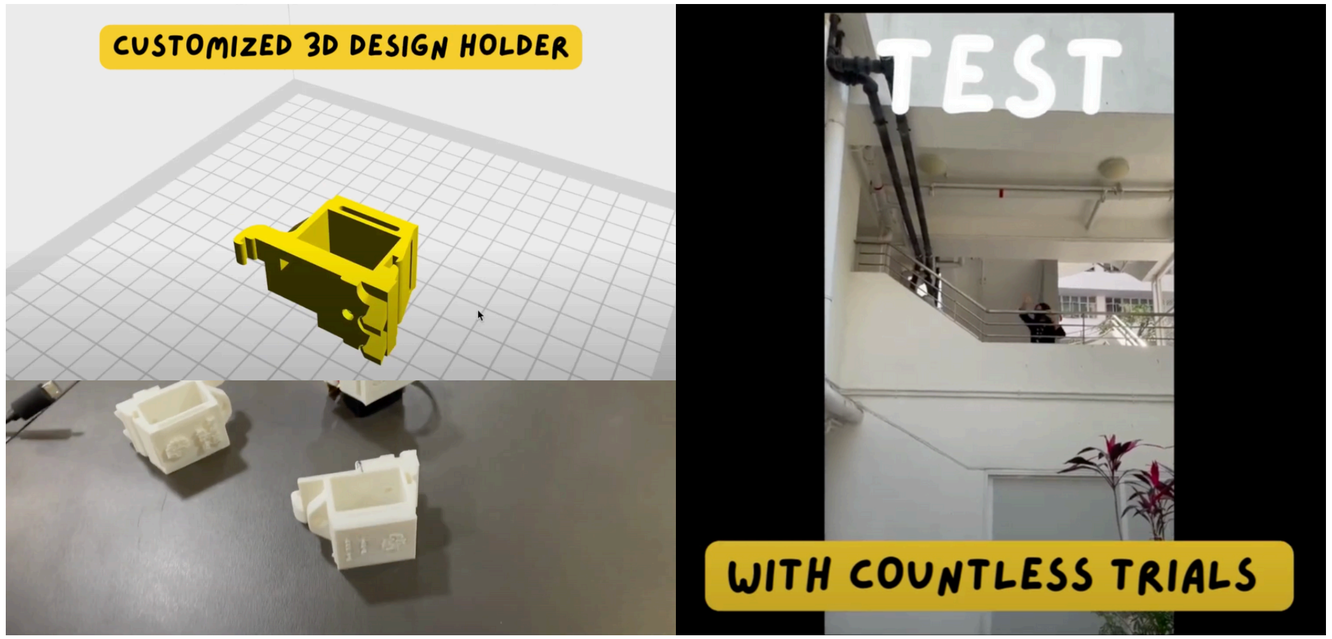
Digital Egg Drop Challenge

Project Intro

One fun activity that utilizes the Micro:bit is the digital egg drop challenge. In this activity, students use the device's built-in sensors to collect data on the timestamps of free falling objects. The goal is to create a protective device that will prevent an egg from breaking when dropped from a certain height. This activity is used in MYP math classes as a way for students to learn about quadratics and the physics of motion.

By analyzing the data collected from the Micro:bit, students can apply mathematical concepts to design and improve their egg-drop devices.

Setup:



Project Overview

ALIGNMENT

Math



Weighing Scale

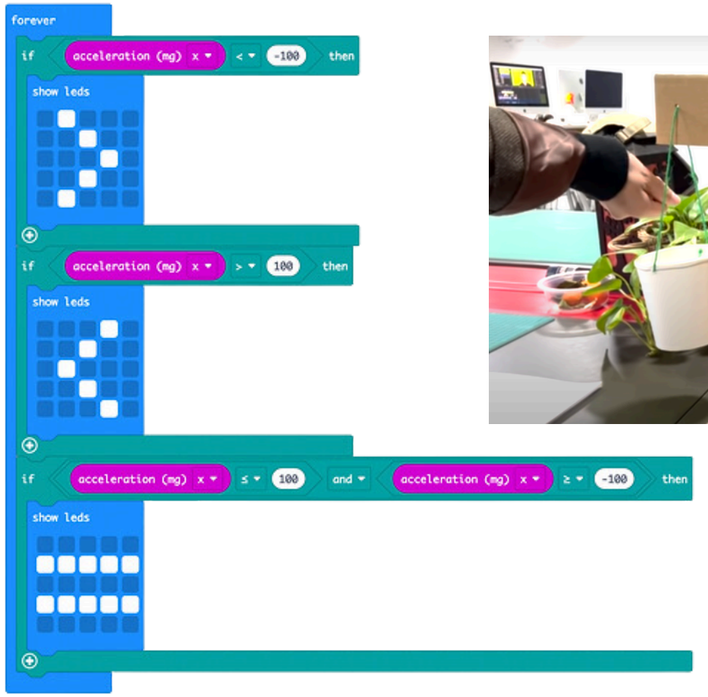
Project Intro

One exciting project that you can do with it is making an intuitive weighing scale. By using the built-in accelerometer on the Micro:bit, you can measure the force of gravity acting on an object and calculate its weight. This is a fun and straightforward way to learn about the principles of weighing scales.

What's more, this project is a great way to incorporate maker education and technology into your learning. You get to explore the Micro:bit's capabilities, apply math and physics principles, and develop your problem-solving skills.

So, if you're interested in learning more about the Micro:bit and want to try your hand at creating your own weighing scale, then this project is perfect for you!

Setup:





Project Overview

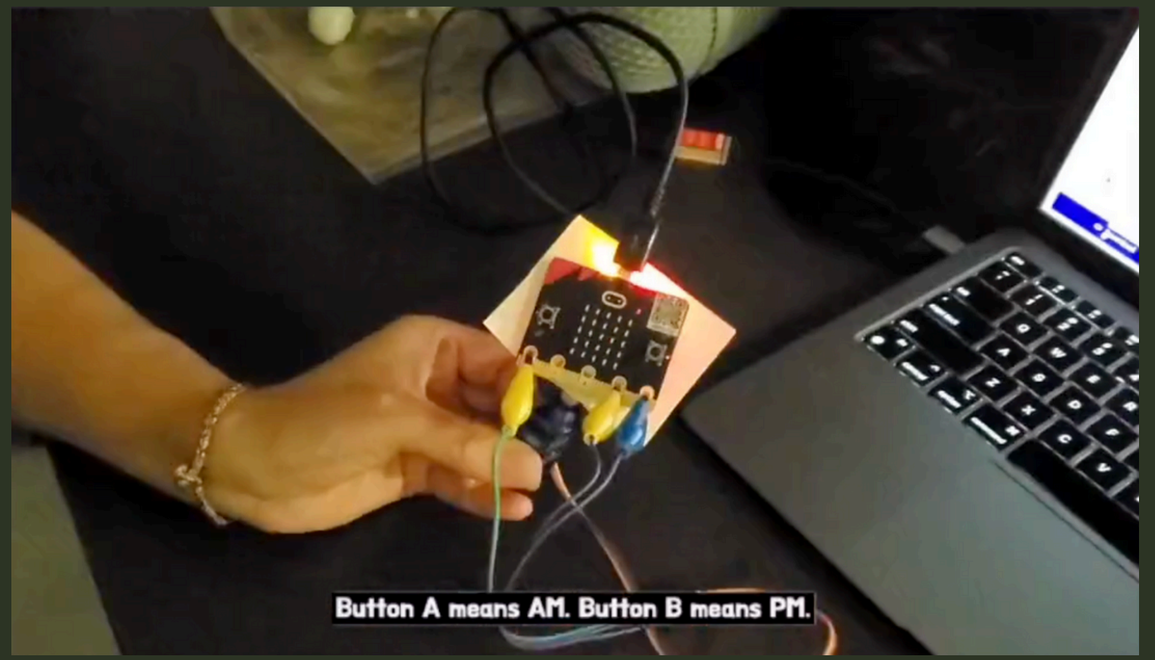
ALIGNMENT

Solar Optimizer

Project Intro

Maximizing solar power with a Micro:bit and servo, my sun tracker uses the built-in light sensor to follow the sun's path. Buttons A and B distinguish AM and PM. With a solar panel attached, this self-sufficient system optimizes energy collection throughout the day!

Setup:



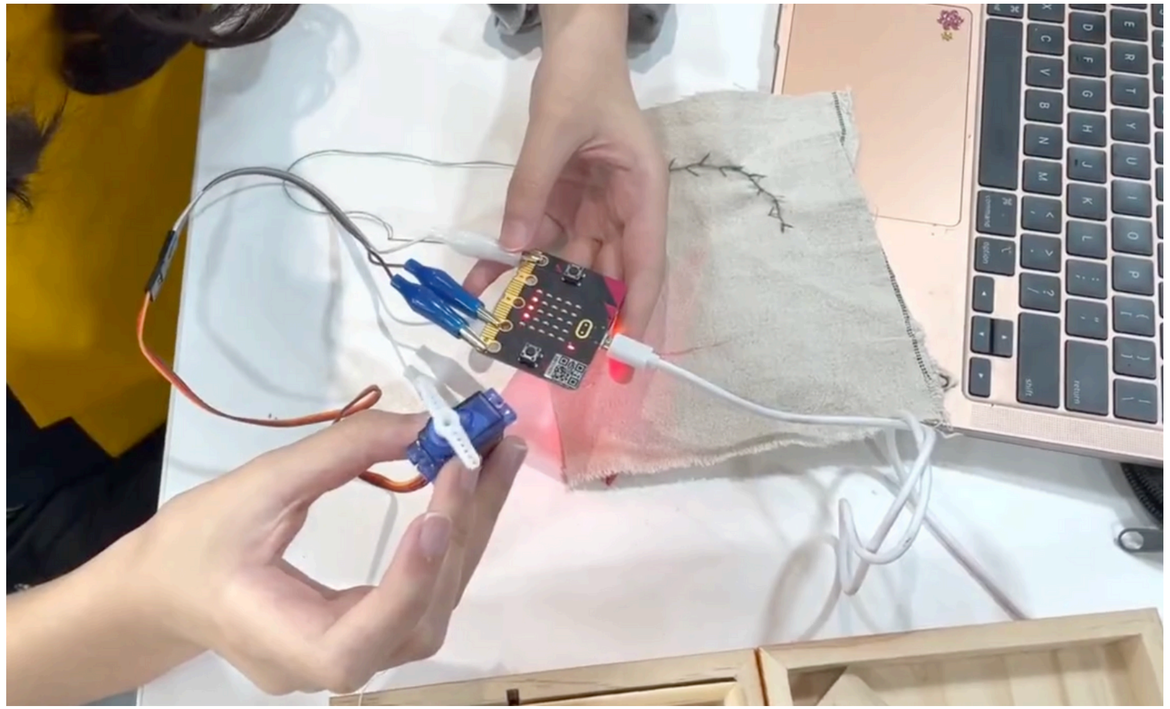
Project Overview

Anxiety Detector

Project Intro

I used a sound sensor to control a servo's speed on the Micro:bit! An anxiety detector helps people manage noise and care for others' well-being. A good example that could inspire students to use Micro:Bit to create tools that can be used in daily life to help others.

Setup:



Project Overview

ALIGNMENT

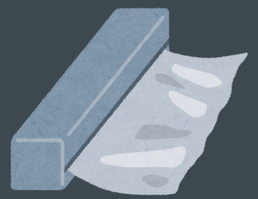
MakerEd



Ring Toss

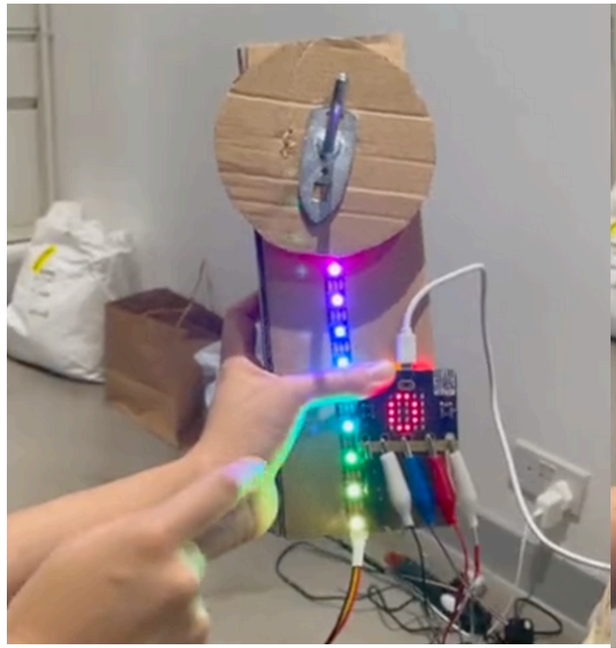
Project Intro

I created a Micro:bit ring toss game with some recycled materials.
Press buttons A and B to adjust the difficulty. Score points and watch the LED lights change colors.



Use the fact that tin foil is conductive

Setup:





Project Overview

ALIGNMENT

MakerEd

Elsa's Dance Box

Project Intro

I created a music box with a dancing Elsa for my 2-year-old Frozen fan using Micro:bit! The Micro:bit senses the music, making Elsa spin while a snowflake animates. This project involved laser-cutting, 3D design, digital design, and coding skills.

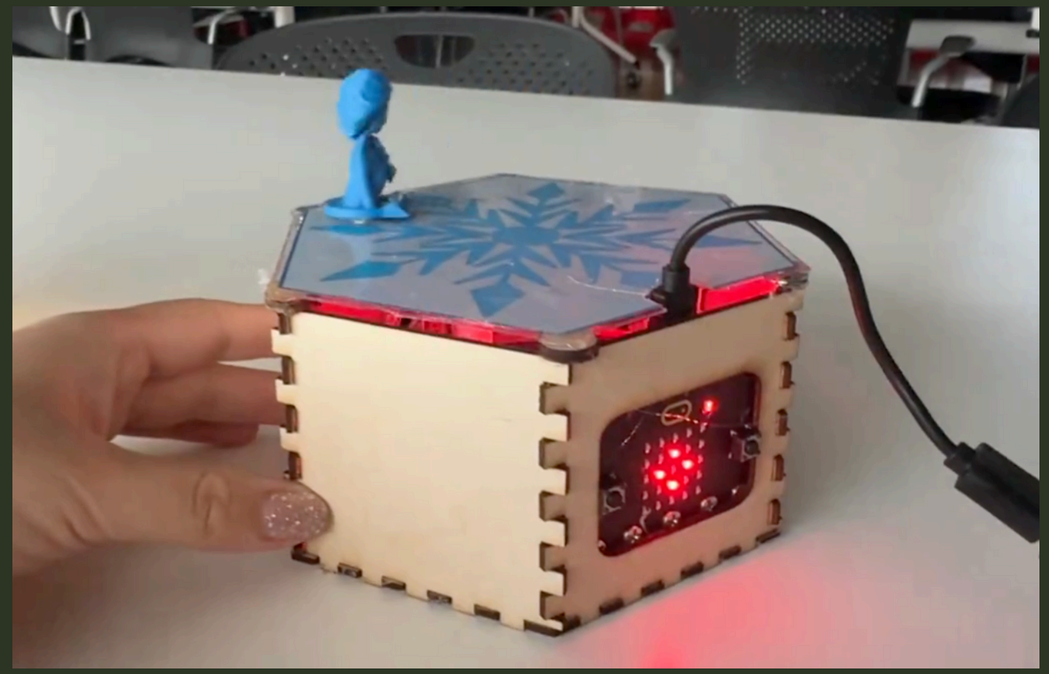
Platforms I Used In This Project:

MakerCase

TINKERCAD

MakeCode

Setup:



Project Overview

ALIGNMENT