

Strawbees.®



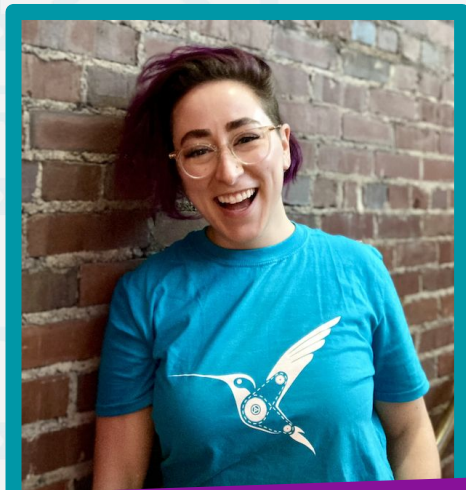
# ***HALLOWEEN WEBINAR***





# HALLOWEEN WEBINAR

Spooky Smart Halloween Fun with Strawbees & BirdBrain Technologies



**Sarah FitzHenry**



**Erik Thorstensson**

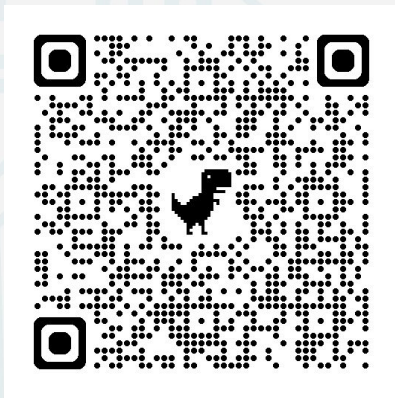
@birdbraintech @Strawbees



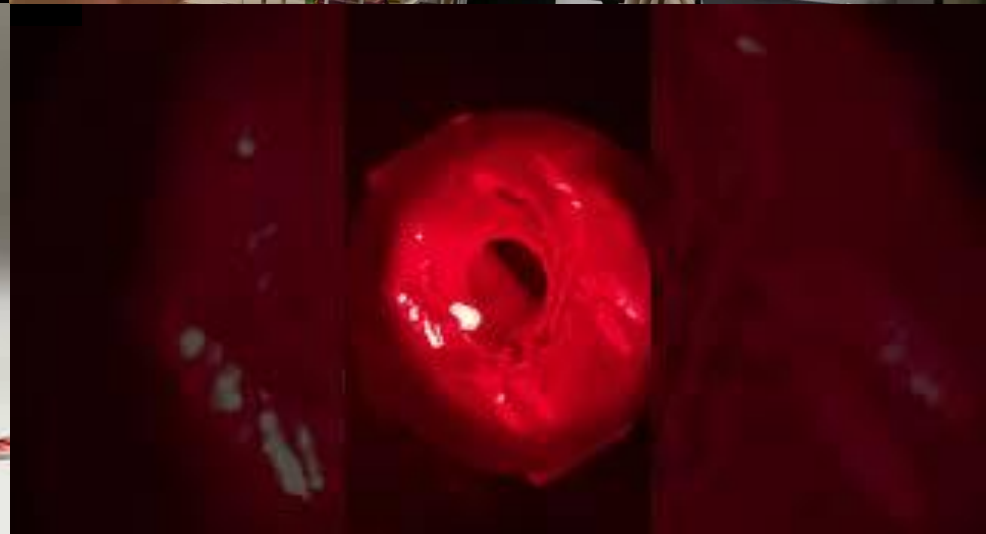
# Outline

- Meet BirdBrain Technologies and the Hummingbird Kit
- Meet Strawbees
- Strawbees + Hummingbird
- Spooky inspiration time 🎃 👻 🕷️
- Lots of free resources!
- Giveaway announcement
- Questions

Link to slides:









# What is a robot?





# Sense-Think-Act Robot

Sense the environment...

Plan how to react...

Do something!



SENSE



?

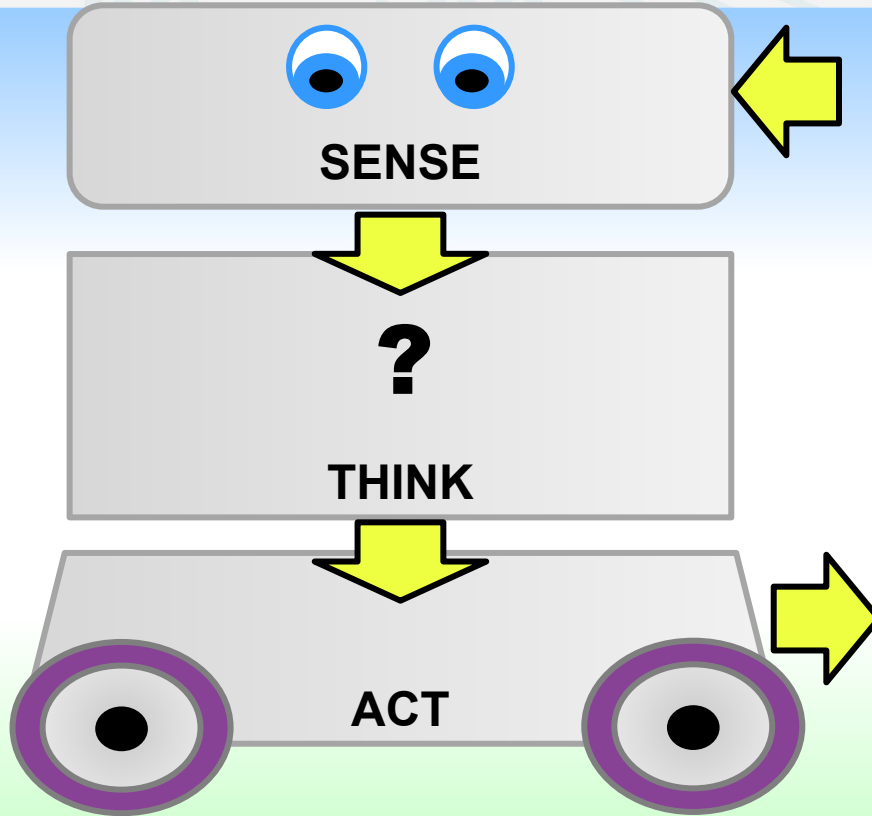
THINK



ACT



The Environment





# MEET THE HUMMINGBIRD ROBOTICS KIT

@birdbraintech @Strawbees







BirdBrain Technologies' mission is  
to inspire **deep and joyful**  
hands-on learning in **all students** .

@birdbraintech



# Hummingbird Robotics Kit

Flexible - Creative - Reusable



Design, build, and program a personally meaningful robot out of any materials, with any device, in multiple programming languages.

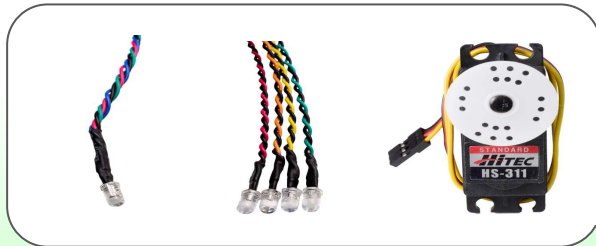
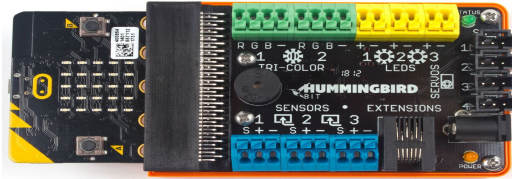


# Take a peek inside

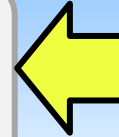




# Sense-Think-Act Robot



SENSE



?

THINK



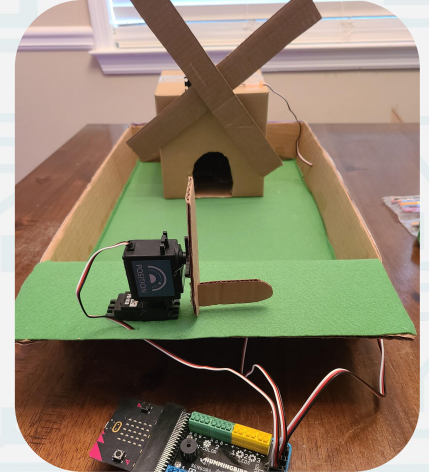
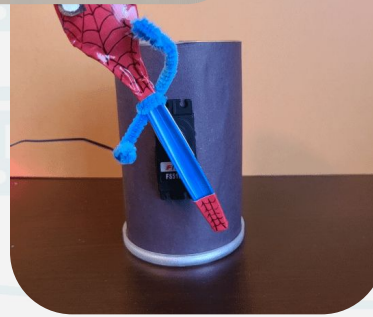
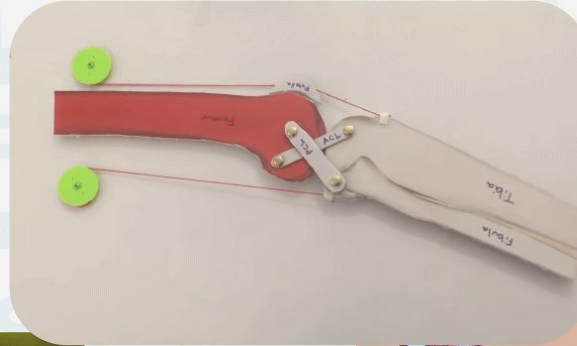
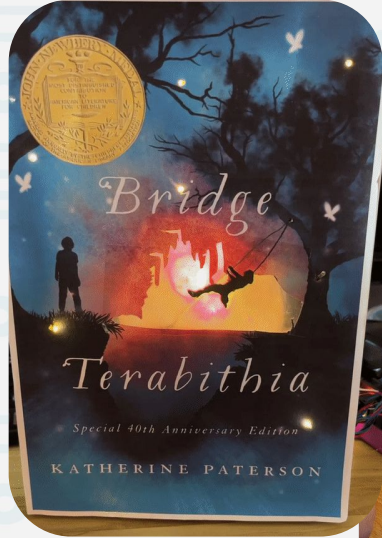
ACT



The Environment



# What can you make with the Hummingbird Kit?





# Hummingbird Resources

**Hey Teachers! Are you the proud new owner of a Hummingbird Kit? You're in the right place!**

This guide has everything you need to start teaching. Open up your kit and let's get started!



## Start Teaching

### Tri-Color LED

Steps 1 2 3 4 5 6 7

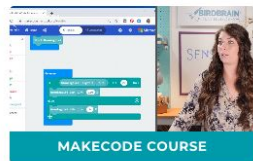


This module will show you how to use a tri-color LED with the Hummingbird Bit. A tri-color LED is a small light with four wires. The tri-color LED actually has three tiny lights inside it. One is red, one is green, and one is blue. You can combine different amounts of red, green, and blue light to make different colors.

Please note that there is no sound in these videos.

## Programming Tutorials

Introduction to programming, building, and teaching creative robotics



MAKECODE COURSE



BIRDBLOX COURSE



SNAP! COURSE

## Professional Development

**Borrow  
a Kit for  
FREE!**

@birdbraintech @Strawbees



# More Hummingbird Resources

Borrow HB Kit Free

[birdbraintechnologies.com/demo](http://birdbraintechnologies.com/demo)

Purchase HB Kit

[store.birdbraintechnologies.com](http://store.birdbraintechnologies.com)

HB Project Library

[learn.birdbraintechnologies.com/  
hummingbirdbit/projects/](http://learn.birdbraintechnologies.com/hummingbirdbit/projects/)

[Flocking Amazing Podcast](#)

[Facebook Educators Group](#)

@birdbraintech



The background of the slide features a light gray, stylized circuit board pattern with various lines, nodes, and square components. A teal-colored rounded rectangle is centered on the slide, containing the text "What questions do you have?".

**What questions do you have?**

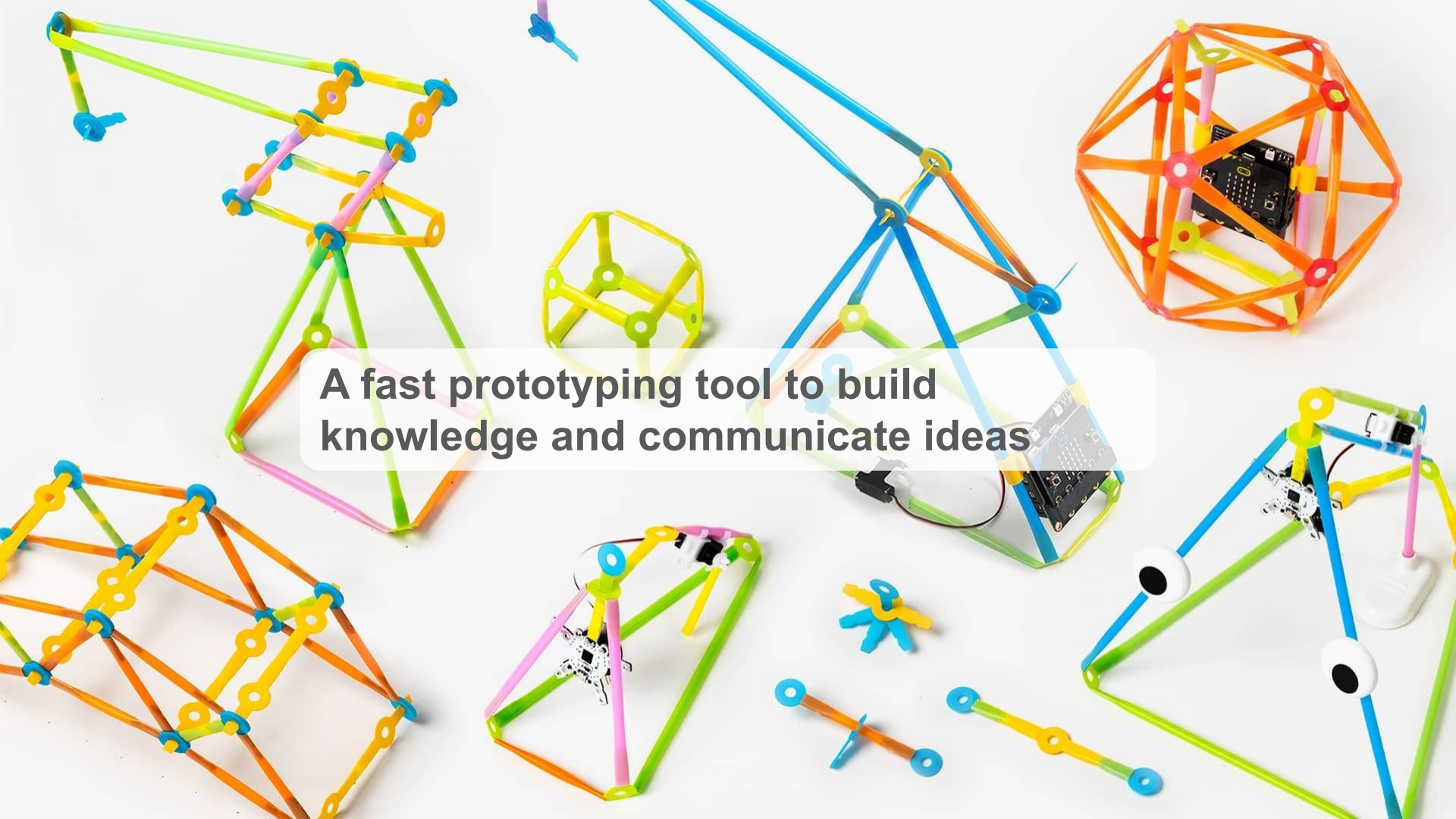


# MEET STRAWBEES

@birdbraintech @Strawbees







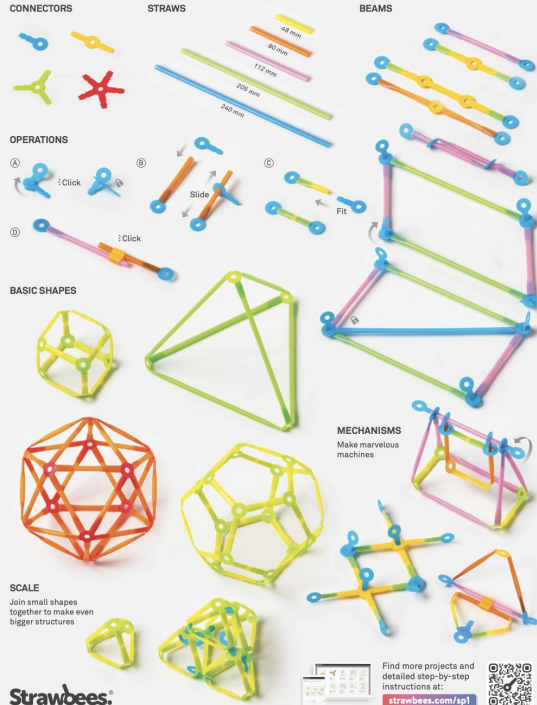
**A fast prototyping tool to build  
knowledge and communicate ideas**



# Strawbees introduction

## STRAWBEES SYSTEM INTRODUCTION

Strawbees is a construction set for hands-on exploration. Use the versatile connectors and straws to build structures and mechanical projects for inventive stories!




You and your best friend have developed a secret language. Create the letters of your name in this new language!



@birdbraintech @Strawbees




# Classroom content & Collaborative Builds


 **Strawbees**  
CLASSROOM

DASHBOARD

LIBRARY

VI

 LIBRARY → LESSONS → CRANE AUTOMATION (MICRO:BIT)




LESSON


### Crane Automation (micro:bit)


By Strawbees Team

Explore in this lesson the reasons for automation and improvements to the quality of human life with the Sustainable Development Goals of infrastructure, industry, innovation with good health. In many robotic and automated creations, the movement of the motor matches the expected result will not be perfect the first time. Explore how to get different results of

ASSIGN TO STUDENTS


 Add to course

 Add to favorites





 Share


1. Overview and Objectives (0...
2. Materials
3. Facilitation and Collabo...
4. Preparation (30:00)
5. Warm-up (10:00)
6. Imagine (15:00)
7. Create (30:00)
8. Build (45:00)
9. Reflect (30:00)
10. Challenges (30:00)
11. References and Extra R...


### STEP-BY-STEP


 1 2 3 4 5 6 7 8 9 10  
11 12 13 14 15 16 17 18 19 20  
21

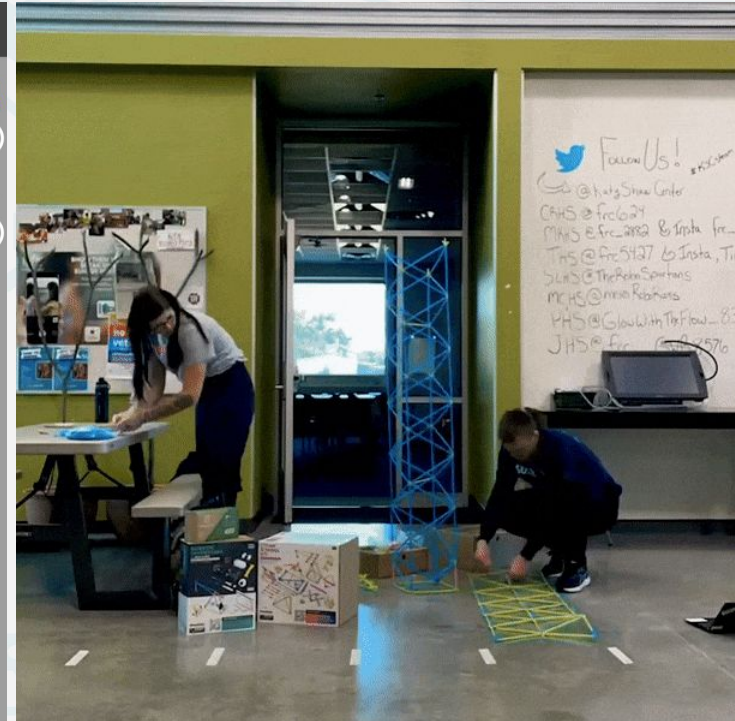
#### 1 Make a trapezoid base

 × 4    × 1    × 1    × 2

 × 4











@birdbraintech @Strawbees



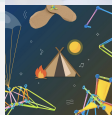
# Strawbees Resources



Free Access to Strawbees Classroom - sign up 👉 [Link](#)



Strawbees Classroom Walkthrough [Link](#)



Strawbees Summer Camp Course [Link](#)



Simple STEAM Ideas Downloadable PDFs [Link](#) (no Strawbees needed!)



Deep Learning Free Downloadable PDF [Link](#)



Teacher Support [Link](#)



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**What questions do you have?**



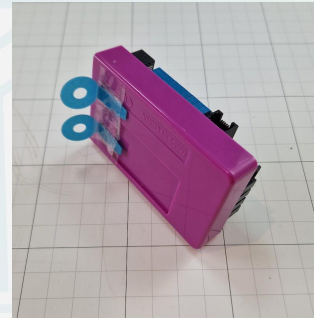
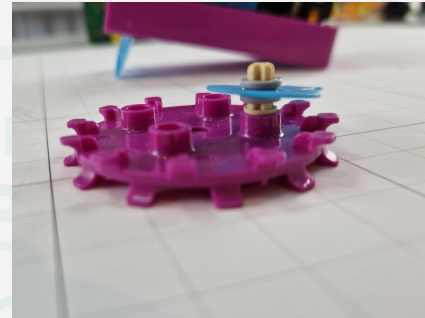
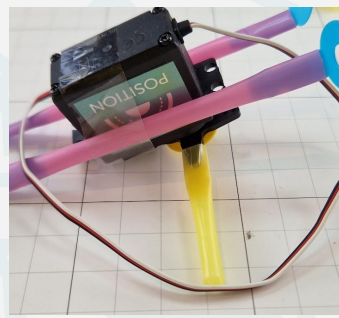
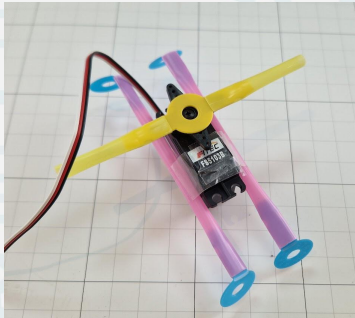
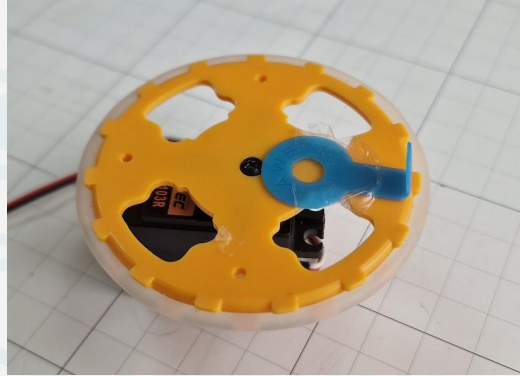
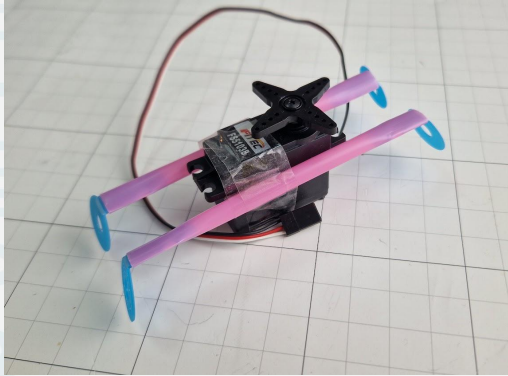
# STRAWBEES + HUMMINGBIRD

@birdbraintech @Strawbees





# Strawbees + Hummingbird basics





Servomounts

Hummingbird clip

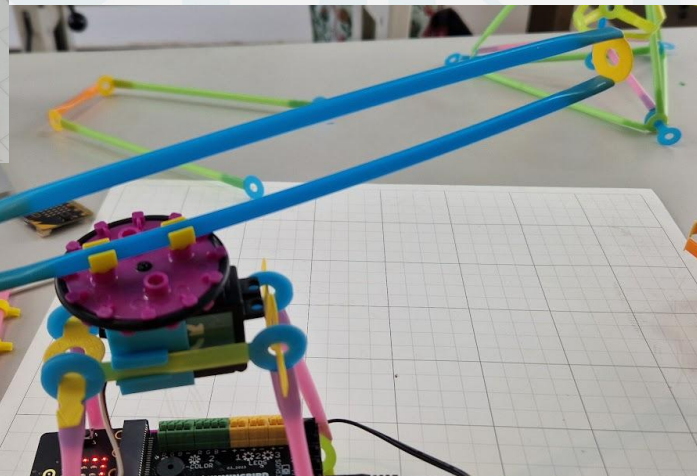
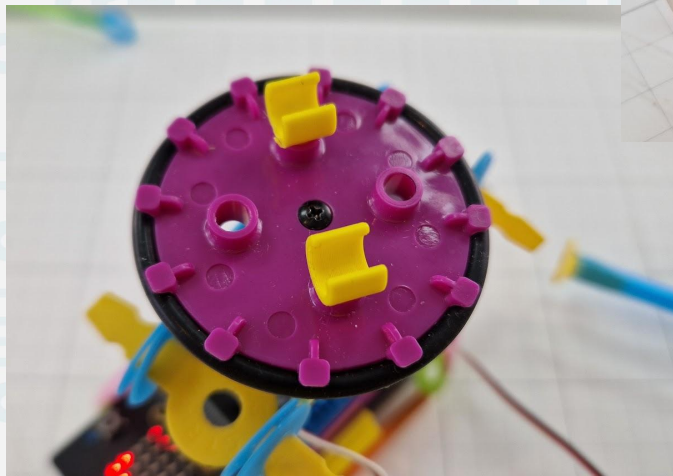
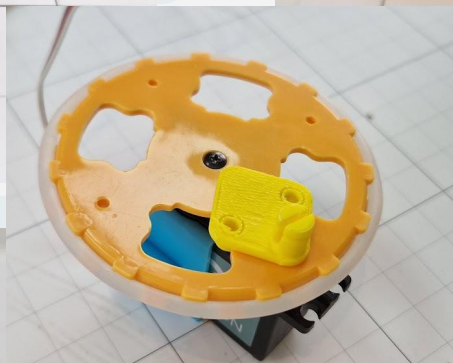
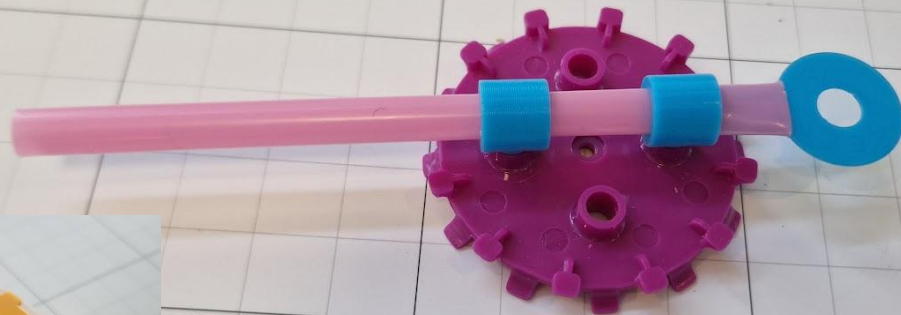
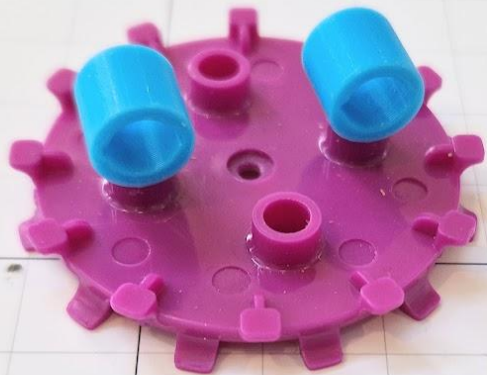
Purple wheel  
attachments

Batterybox clip

Yellow wheel  
attachments

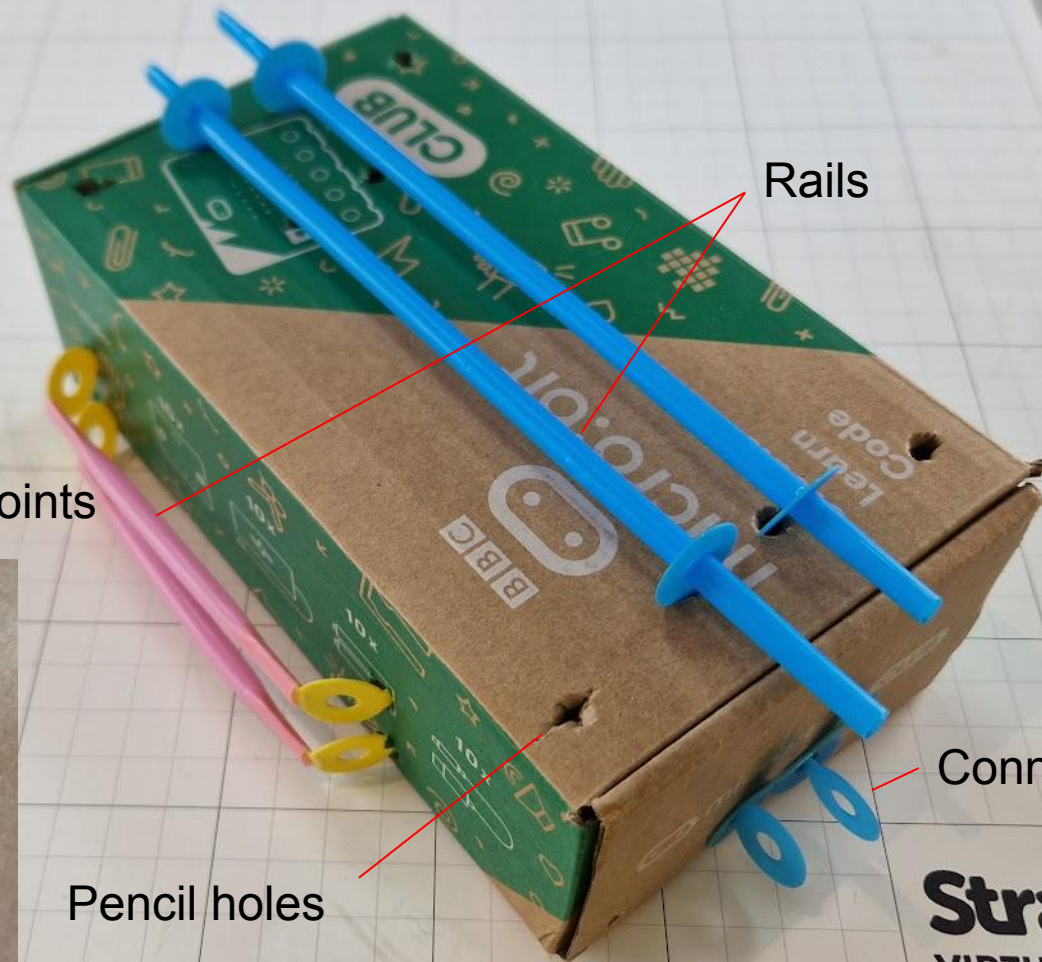
Bonus stop clip





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Rails

Locks or connection points

Connection points

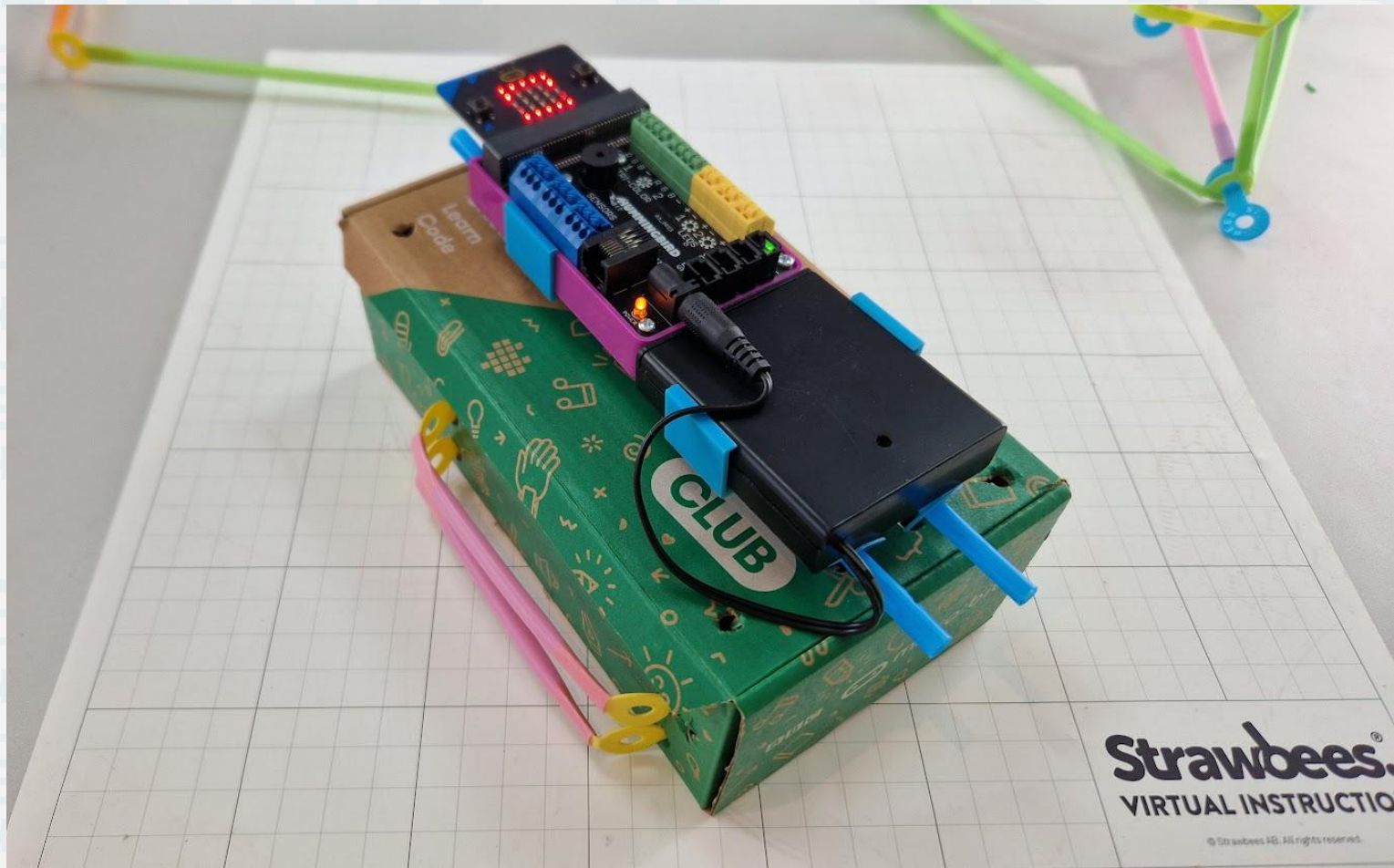
Pencil holes



**Strawbees®**  
VIRTUAL INSTRUCTION

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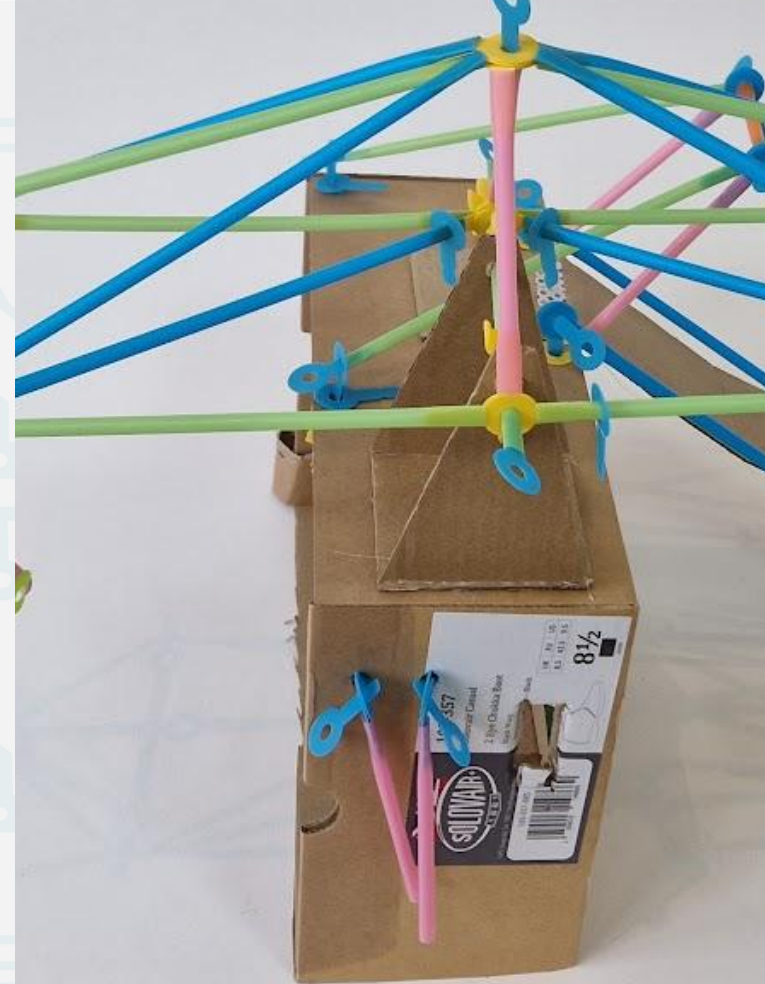
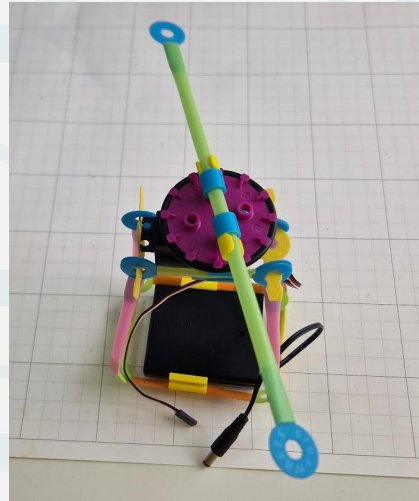
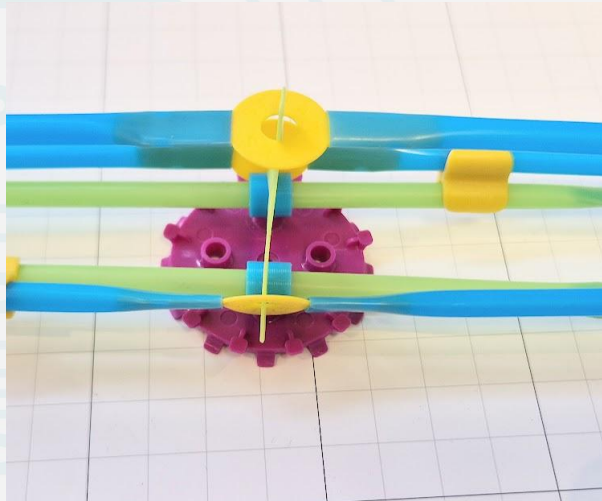
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VIRTUAL INSTRUCTION

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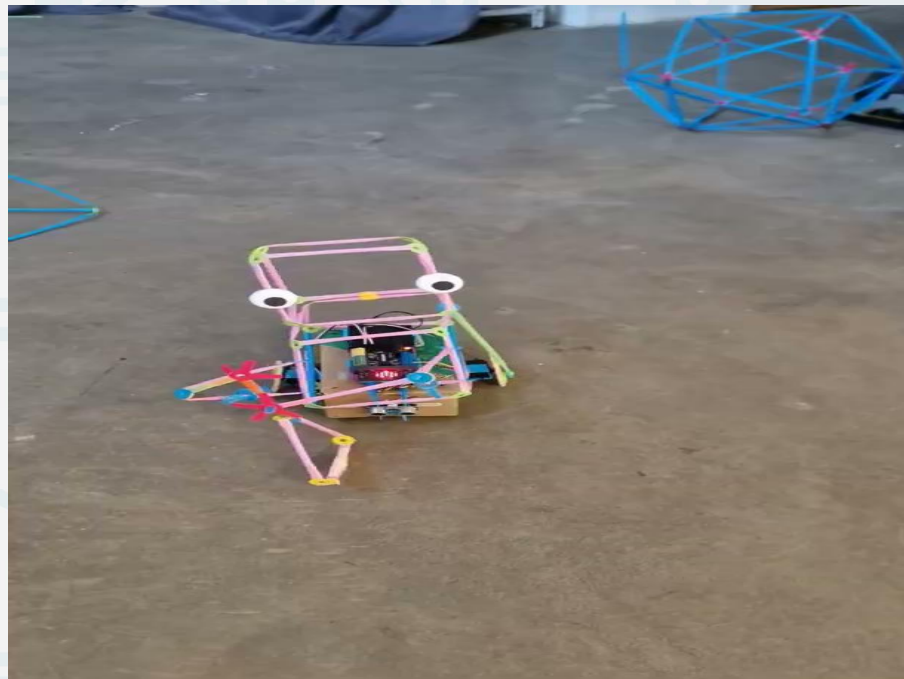
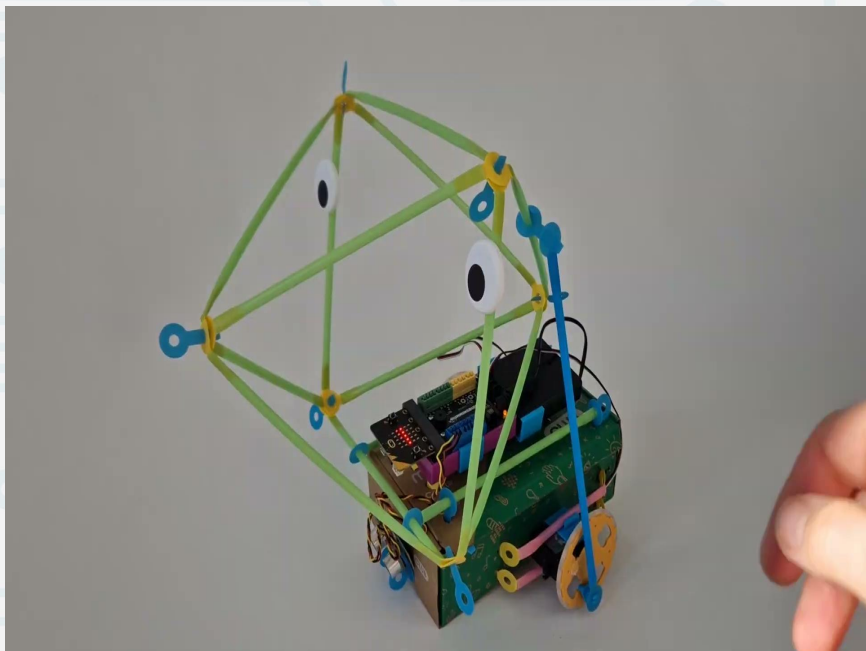
@birdbraintech @Strawbees



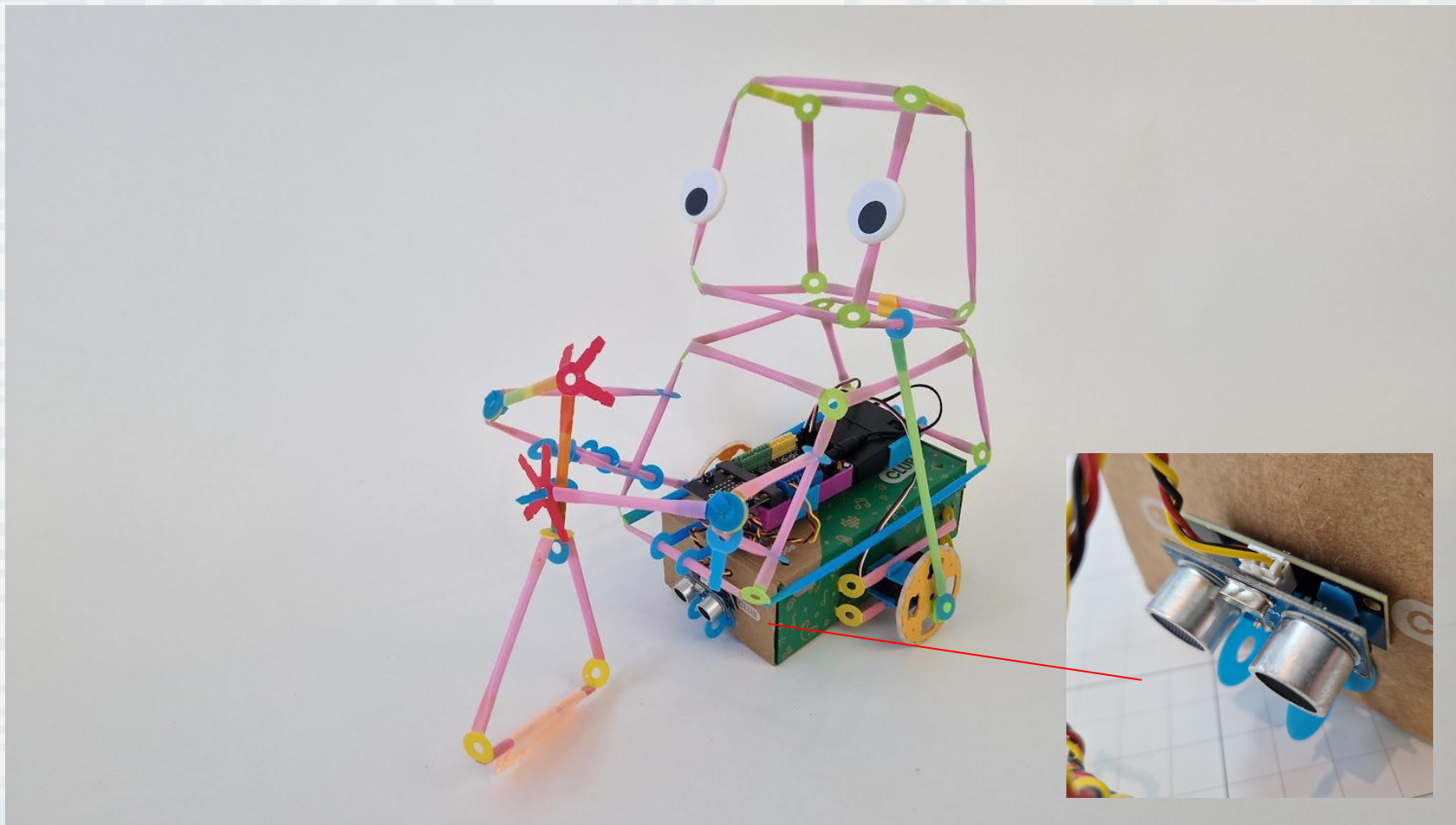
Combining 3D prints, cardboard hacks on [birdbraintechologies.com](http://birdbraintechologies.com) with rails holes and connection points makes for a highly iterative and creative design process.











@birdbraintech @Strawbees



The background of the slide features a light gray, stylized circuit board pattern with various lines, nodes, and square components. A teal-colored rounded rectangle is centered on the slide, containing the text "What questions do you have?".

**What questions do you have?**



# LET'S GET SPOOKY!

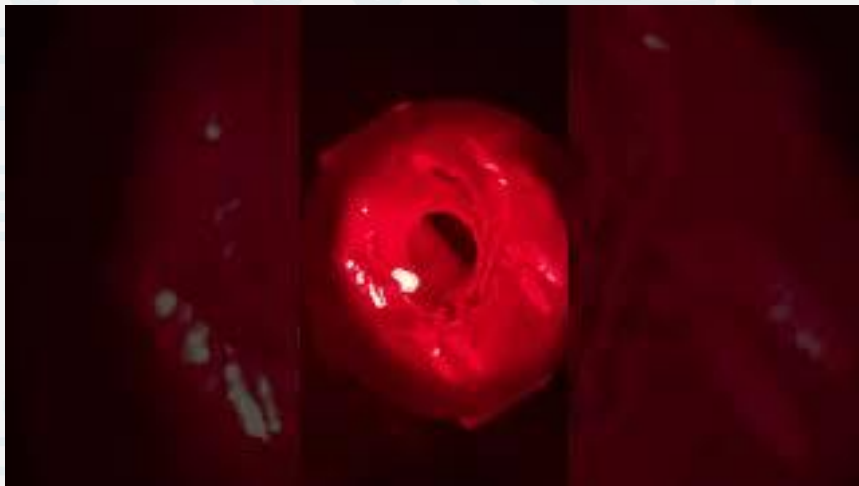


@birdbraintech @Strawbees

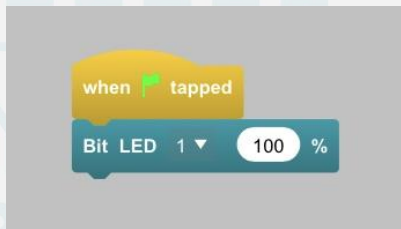





# Shadow Thrower




Sample Code:




## SHADOW THROWER




1. Draw a circle on a piece of paper by tracing the end of the cardboard roll. Cut that circle out.



2. Design or trace the shape you would like your shadow thrower to project. Cut the spooky shape out of the center of your circle.
3. Tape a sheet of aluminum foil to the inside of your cardboard roll; lining it completely.



4. Tape your paper circle to one end of your cardboard roll.
5. Insert your single or tri-color LED light through the opposite end of the cardboard roll.



6. Program your LED light.





Take your shadow thrower into a dark room and enjoy!



# Wicked Window

## WICKED WINDOW

1



Prep your window:

1. Cut a "window" into the lid of your shoebox. Be careful to leave enough of a border that the cardboard does not fall apart.
2. Attach parchment or wax paper to the inside of your box lid so that it covers your whole "window". Set the lid aside.
3. Grab the body of your box. Tape a sheet of aluminum foil to the bottom and sides of your box, lining it completely.
4. Poke two small holes in the bottom of your box. Place one LED light (single or Tri-Color, whatever color you choose) in each hole.


## WICKED WINDOW

2

Create your scene:

1. Draw, trace, or print a simple spooky scene on black paper. The scene should be the same size as your "window."
2. Carefully cut out your scene.
3. Flip your scene over. Grab your window lid.
4. Attach your spooky scene to the inside of your window lid via the wrong side. Place the lid, with the scene in place, back onto your box.
5. Program your LED lights to glow or flicker.

Add sensors, sounds, or other spooky effects. Enjoy!





Sample Code:

```
when tapped
repeat forever
  Bit Th-LED 1 Y R 0 % G 0 % B 0 %
  Bit Th-LED 2 Y R 0 % G 0 % B 0 %
  wait pick random 0.5 to 3 secs
  Bit Th-LED 1 Y R 100 % G 100 % B 100 %
  Bit Th-LED 2 Y R 100 % G 100 % B 100 %
  wait 0.1 secs
  Bit Th-LED 1 Y R 0 % G 0 % B 0 %
  Bit Th-LED 2 Y R 0 % G 0 % B 0 %
  wait 0.1 secs
  Bit Th-LED 1 Y R 100 % G 100 % B 100 %
  Bit Th-LED 2 Y R 100 % G 100 % B 100 %
  wait pick random 0.1 to 0.3 secs
```



# Jump Scare



## JUMPSCARE BUILD

Share your work!  
@CodeJoyEdu

### Step 1:

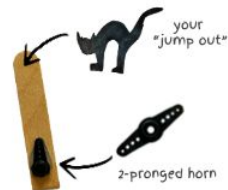
- Create the front layer
- Create the "jump out" element

The front layer should be big enough to completely hide the element that "jumps out."



### Step 2:

- Attach the "jump out" element to a popsicle stick
- Attach the popsicle stick to the servo horn with hot glue or tape



### Step 3:

- Snap on the servo horn with the "jump out" popsicle stick to the motor
- Attach the servo to the back of the front layer near the bottom with hot glue

Why should it be attached near the bottom?  
What range of motion should the popsicle stick have?

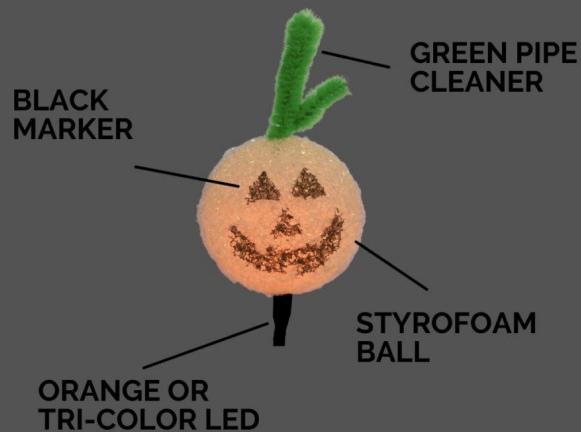




# Jack-O-Lantern

## PUMPKIN 1

WITH THE HUMMINGBIRD KIT

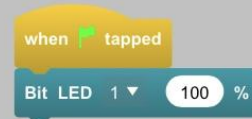


## PUMPKIN 2

WITH THE HUMMINGBIRD KIT

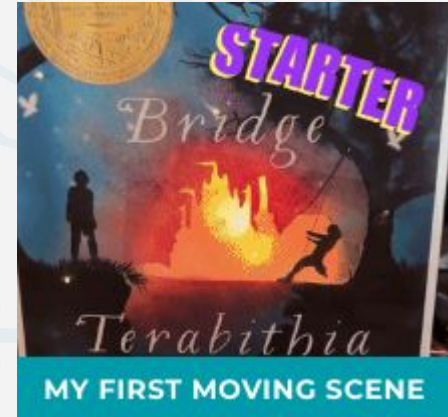


Sample  
Code:





# Haunted Halloween Card



Sample  
Code:





# AI Zombie Rover



First:

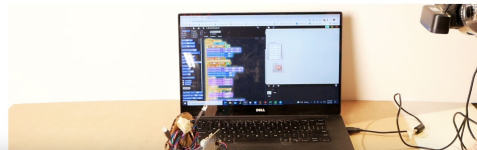


Next:

## AI WITH THE HUMMINGBIRD IN SNAP!

In today's world, artificial intelligence and machine learning are constantly in the news, and we are surrounded by devices collecting and using data about us. While the terms artificial intelligence and machine learning are often used interchangeably, they do mean slightly different things. Artificial intelligence refers generally to any system that enables a machine to make a decision, while machine learning refers to systems that use large amounts of data to create models that make predictions. We are focusing on the latter here, so we will use the term machine learning going forward.

These hands-on activities are designed to enable you to create and test your own machine learning models. You will use your models to write programs with the Hummingbird kit so that you can get a better idea of the power of these models when used in software.





# Halloween scares

Series of fun Halloween jump scares  
built & prototyped using the same basic  
code with local and wireless trigger.  
Makes prototyping much easier works with  
both Robotic inventions and Hummingbird.

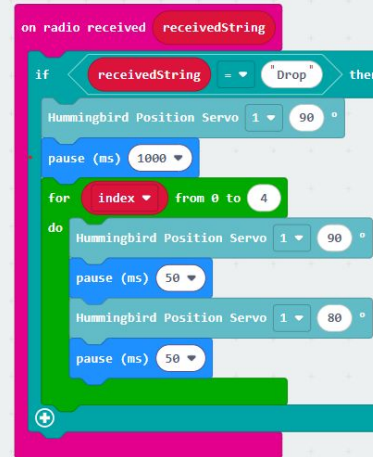
<https://makecode.microbit.org/S18403-78254-12863-03602>

<https://makecode.microbit.org/S18403-78254-12863-03602>

@birdbraintech



# Remote code



<https://makecode.microbit.org/S18403-78254-12863-03602>

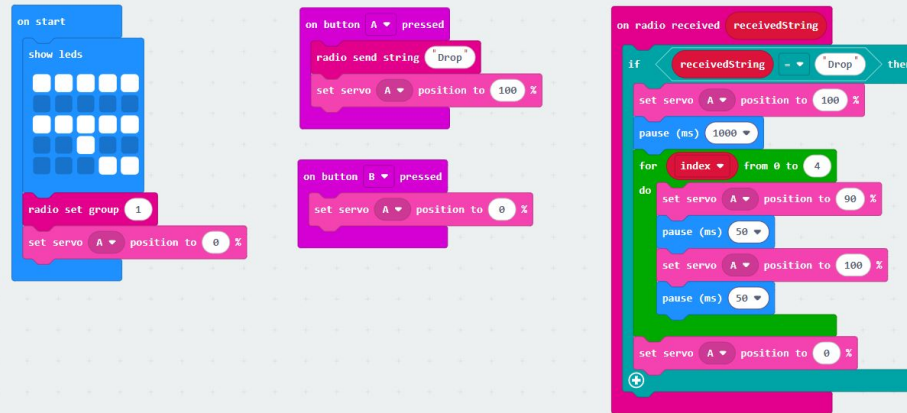
Strawbees code

<https://makecode.microbit.org/S18403-78254-12863-03602>

Hummingbird code



# Remote code



<https://makecode.microbit.org/S18403-78254-12863-03602>

Strawbees code

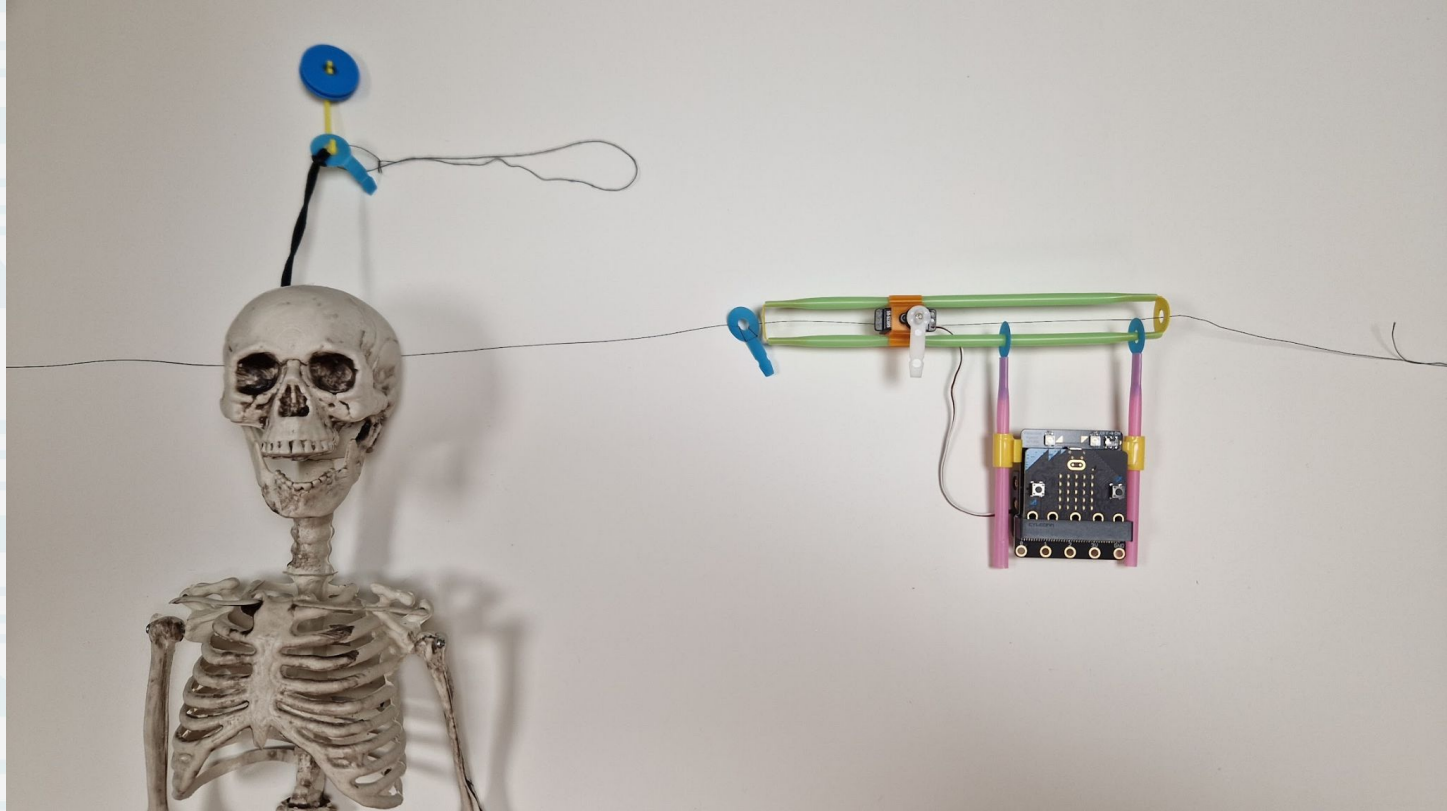
<https://makecode.microbit.org/S18403-78254-12863-03602>

Hummingbird code

@birdbraintech

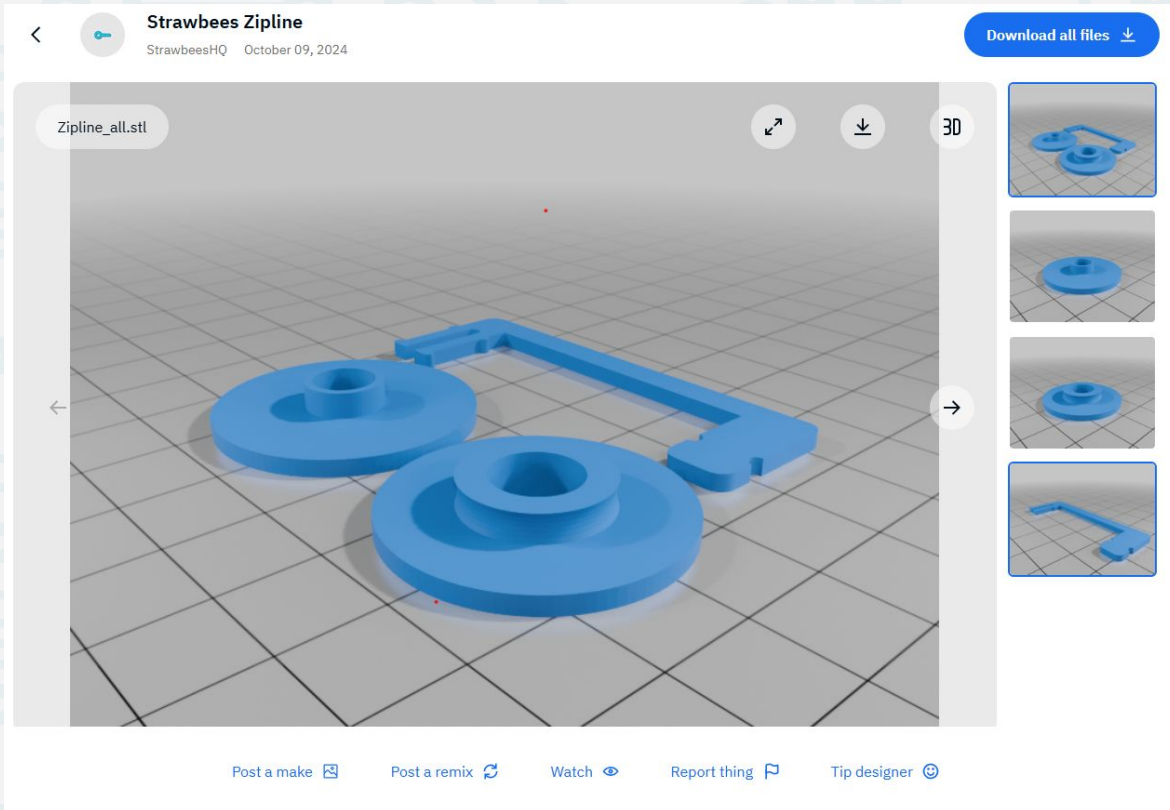


# Zipline launcher





# Zipline launcher



<https://www.thingiverse.com/thing:6792047>

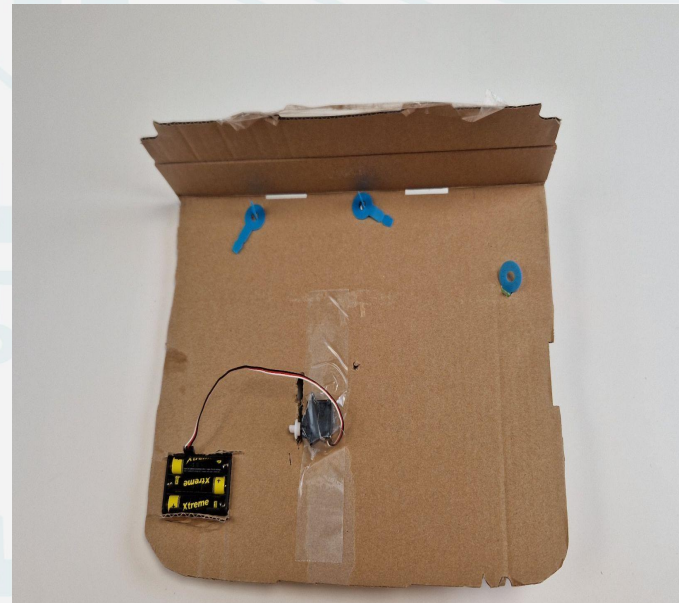
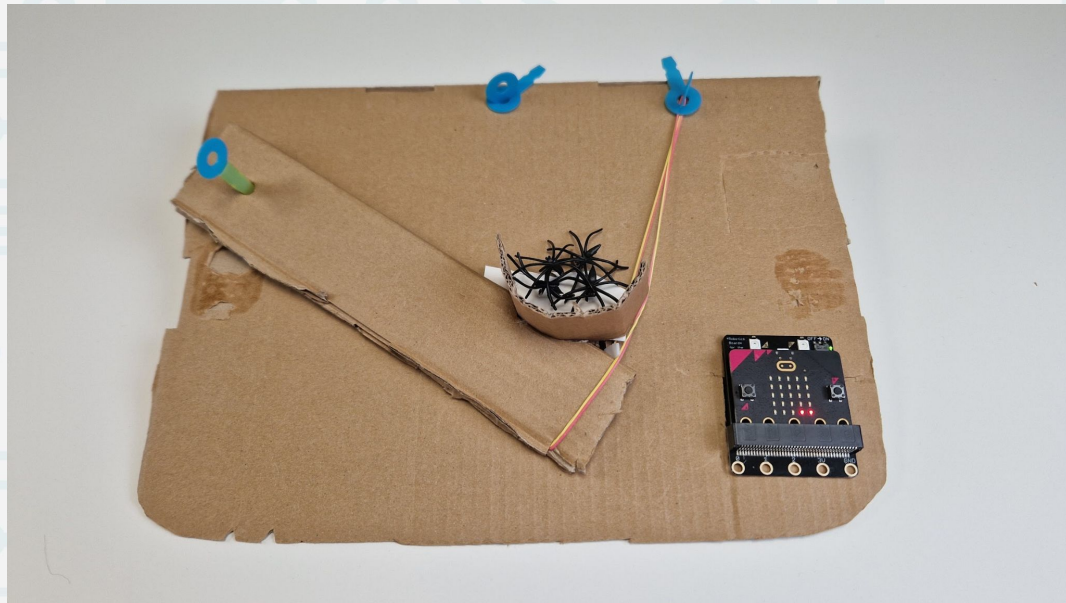


# Zipline launcher



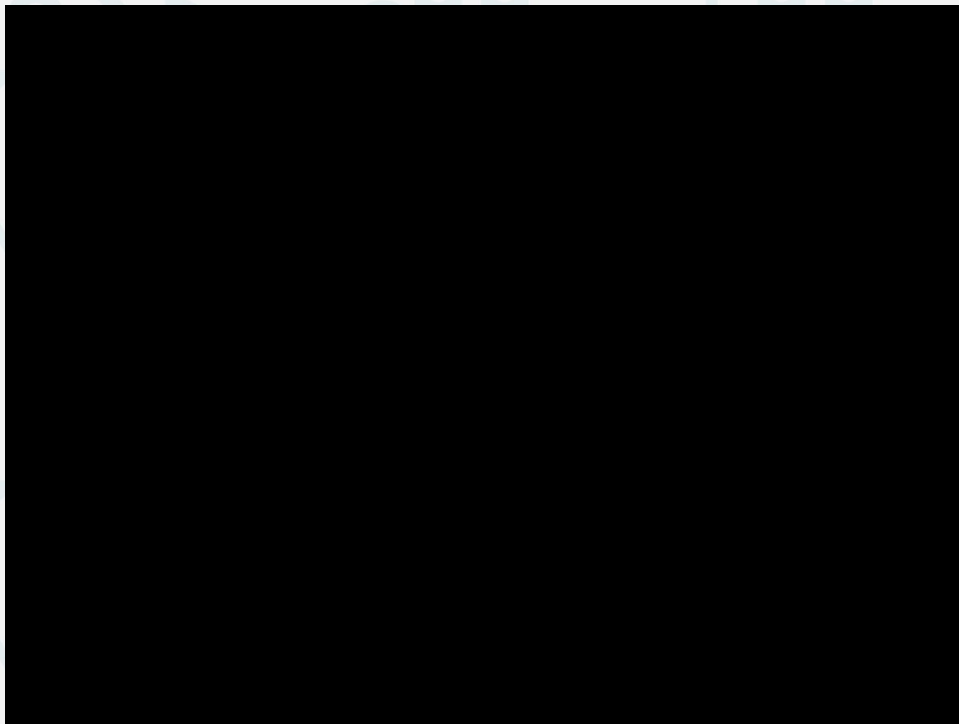


# Spider (small object) launcher



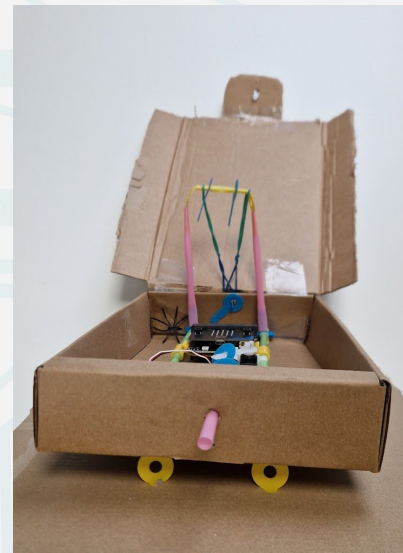
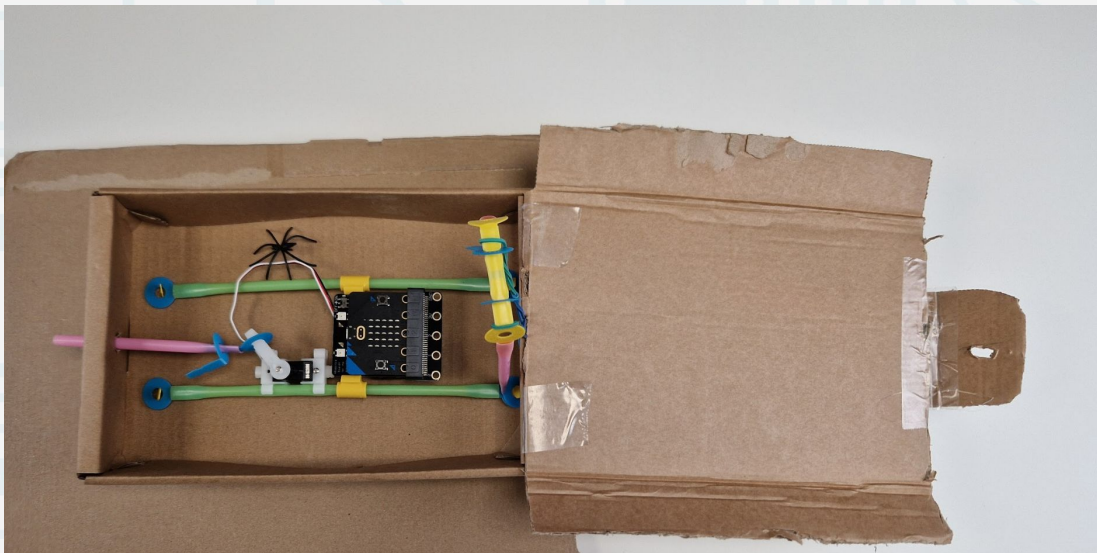


# Spider (small object) launcher



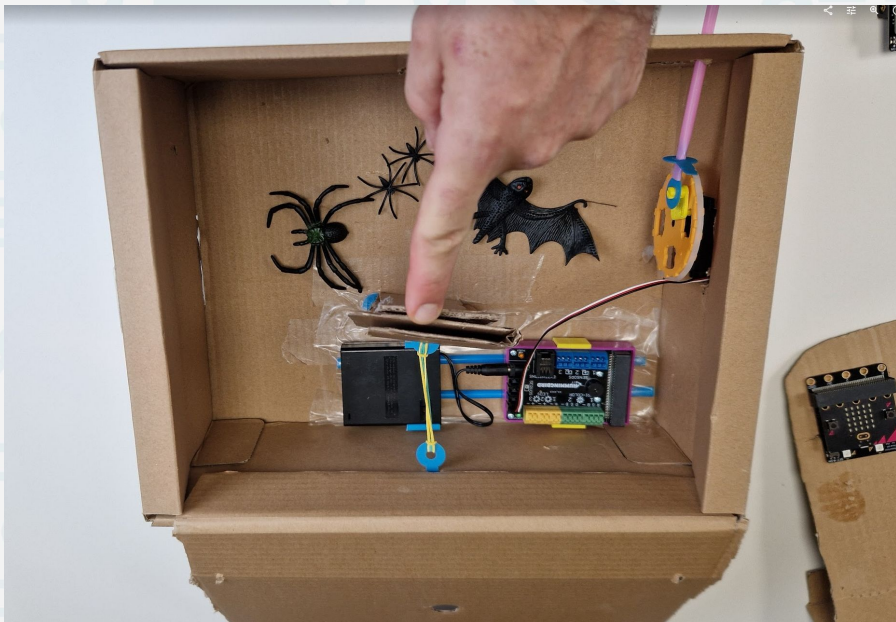


# SMALL SPIDER/BAT DROPOBOX





# BIG SPIDER/BAT DROPBOX





# SPIDER/BAT DROPBOX



@birdbraintech



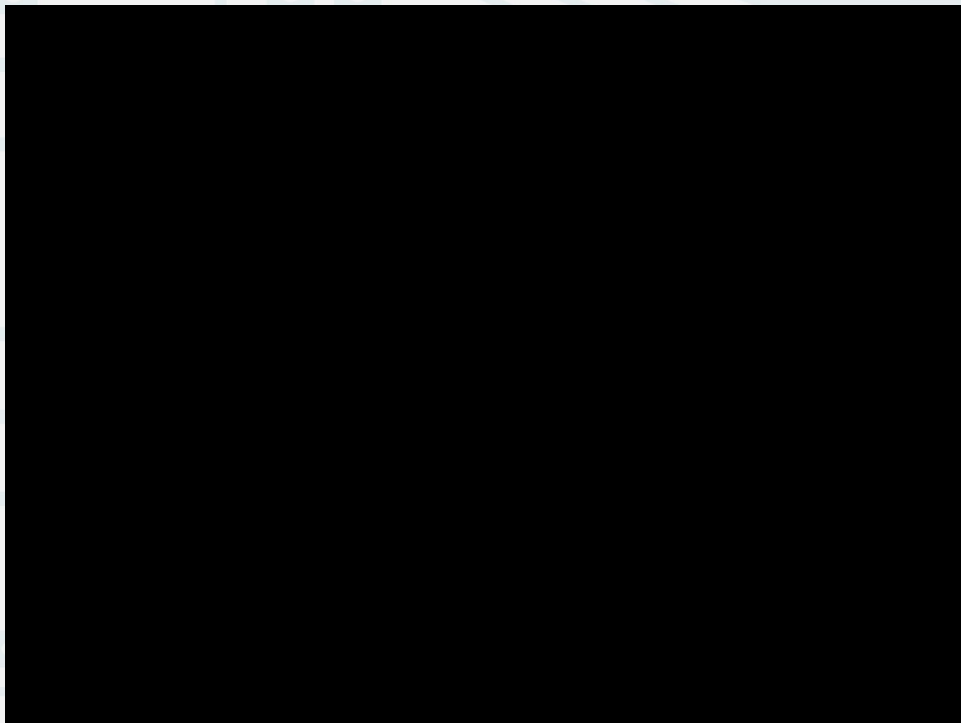
# MOVING EYE PAINTING



@birdbraintech

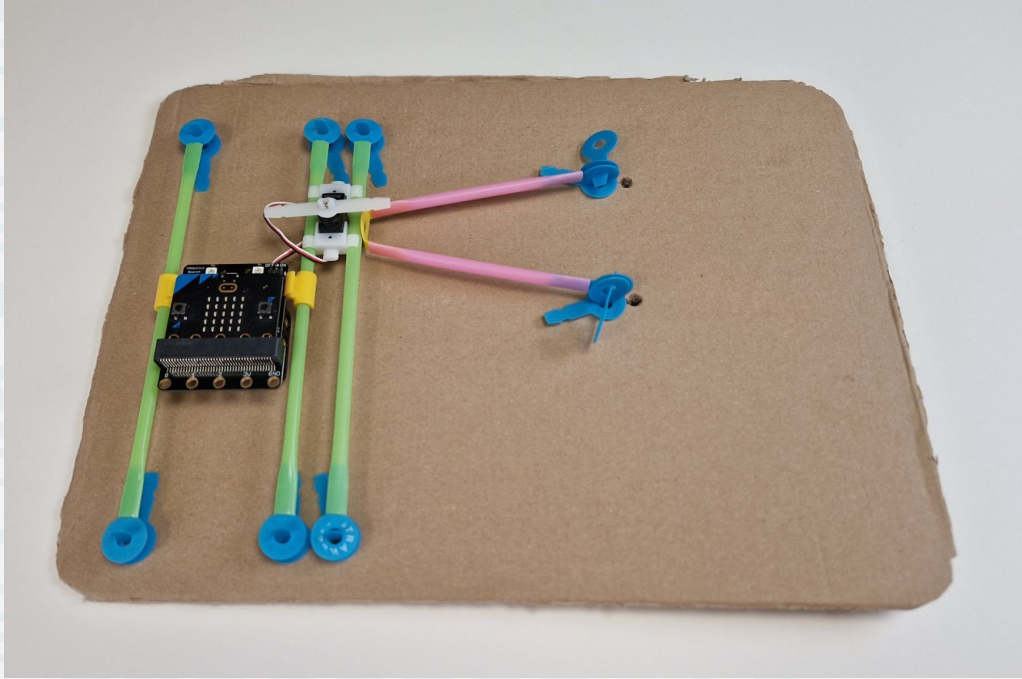


# Remote button press





# SPIDER SWING





# AI triggered jumpscare

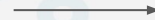
Make teachable  
machine model

[Teachable Machine](#)



Replace remote with  
AI transmitter

[https://makecode.microbit.org/\\_HMfC08esiLUY](https://makecode.microbit.org/_HMfC08esiLUY)



Connect Micro:bit to  
Teachable machine  
using

<https://makeairbots.com/>



# AI triggered jump scares

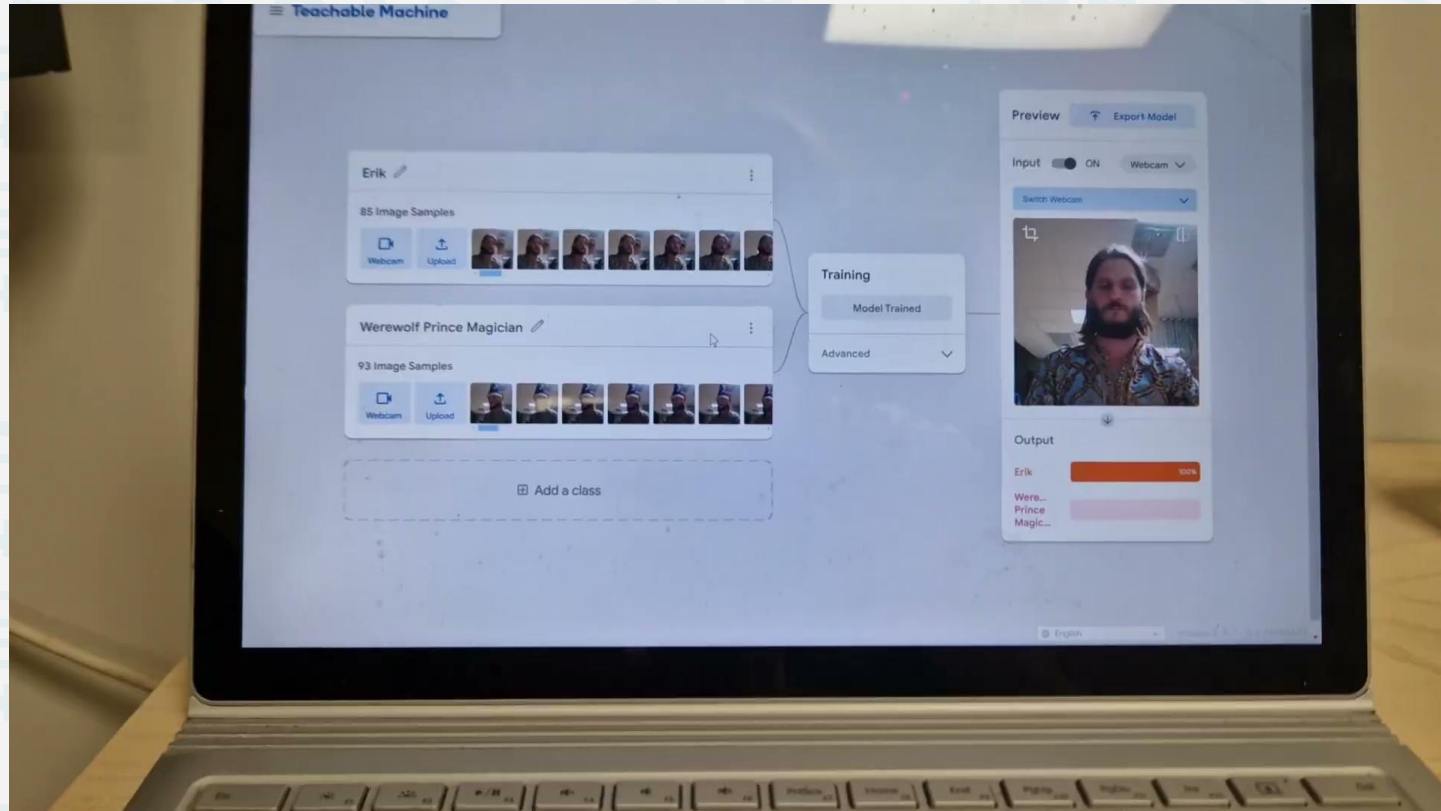
```
on start
  radio set group 1
  serial redirect to USB
```

```
serial on data received new line ( )
  set SerialData to serial read until new line ( )
  if SerialData = "Drop" then
    radio send string "Drop"
  else
    show icon [icon]
```

<https://makecode.microbit.org/S67434-60864-45923-08536>

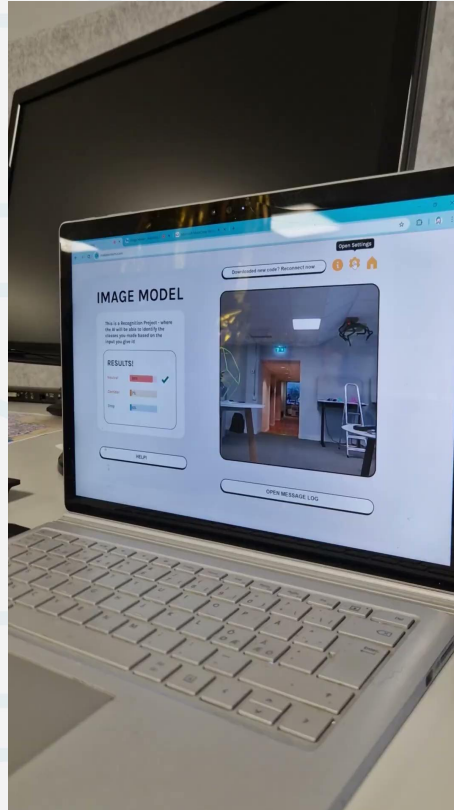


# AI triggered jump scares





# AI triggered jump scares





# Halloween “pranks”

1  
ZIPLINE  
LAUNCHER

2  
SPIDER  
SHOOTER

3  
SPIDER  
SWING

4  
SPIDER/BAT  
DROPBOX

5  
MOVING EYES  
PAINTING



# FREE RESOURCES

@birdbraintech @Strawbees





# Slideshow Links

[Strawbees Halloween Webinar Blog Post](#)  
([all resources included!](#))



- [Shadow Thrower video](#)
- [Wicked Window video](#)
- [Jump Scare video](#), [Jump Scare lesson plan](#)
- [Jack-o-Lantern project materials](#)
- [AI Zombie Rover video](#), [AI with Hummingbird in Snap! activity directions](#)
- [Micro:bit & Teachable machine for Strawbees AI Training \(makeairobots.com\)](#)
- Strawbees AI pdf <https://www.strawbees.com/ai-classroom-activities>
- Strawbees Zipline 3D print <https://www.thingiverse.com/thing:6792047>



# BirdBrain Resources

- [BirdBrain website](#)
- [Borrow a Hummingbird Kit free for 60 days](#)
- [Buy your own Hummingbird Kit](#) (or a [Flock](#))
- Hummingbird Resources:
  - [Start Teaching](#): This guide has everything you need to start teaching with the Hummingbird Bit Robotics Kit
  - [Programming Page](#): Step-by-step video tutorials to program your Hummingbird Kit
  - [Build Page](#): Instructions and tips for building robots
  - [Projects Page](#): Projects to integrate the Hummingbird Bit with your curriculum
  - [Printables Page](#): Classroom-tested printables, planning tools, and more



# Get started with Strawbees



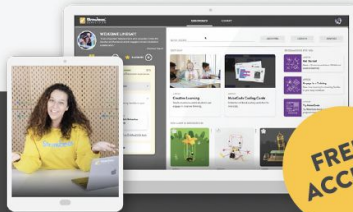
## STEAM Classroom

✔ Suitable for classroom > 30 students



## STEAM Classroom Robotics – micro:bit

✔ Suitable for classroom > 30 students



FREE  
ACCESS



Over 200  
Resources



Curriculum-aligned  
Lessons



Training



Aligned with ISTE Standards for  
Students and Educators

[classroom.strawbees.com](https://classroom.strawbees.com)



Contact us: [info@strawbees.com](mailto:info@strawbees.com)

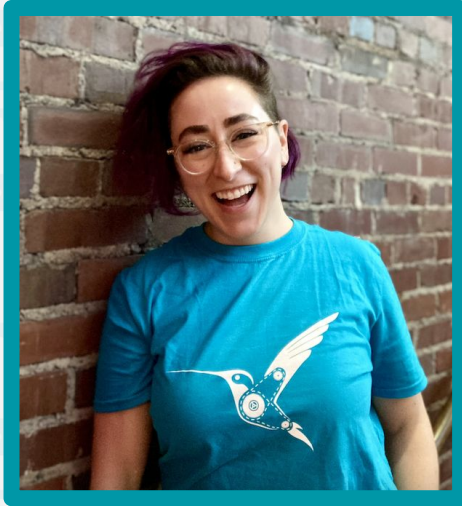
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# Thank you for being here!



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