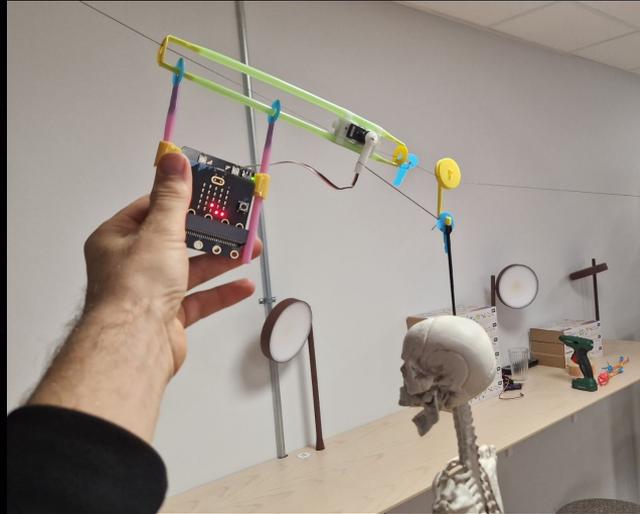


# Remote zipline

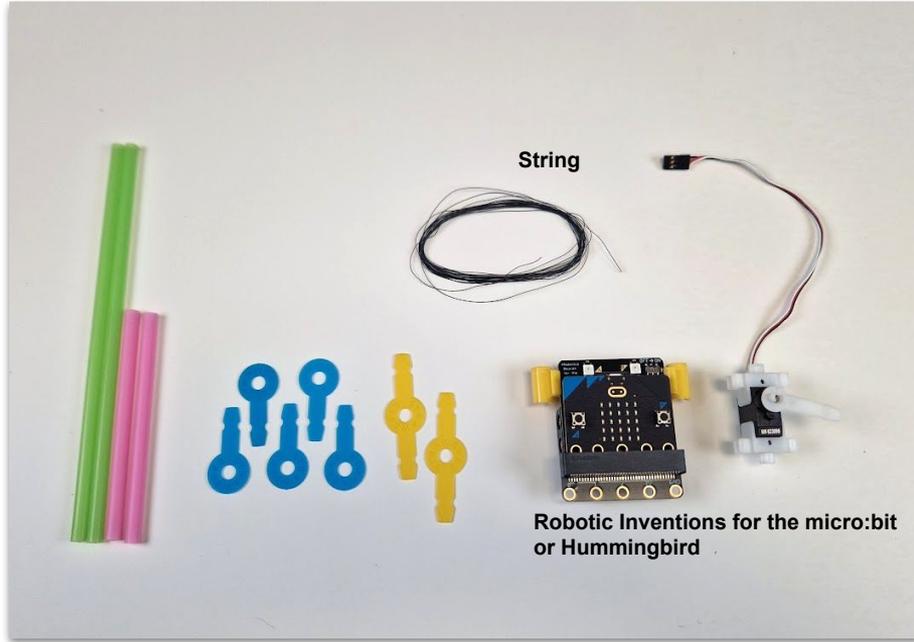


**HALLOWEEN  
WEBINAR**

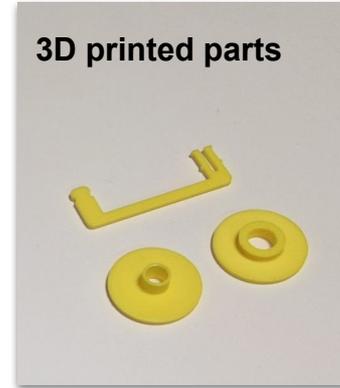


# Remote zipline

For robotic inventions for the micro:bit\*



## 3D printed parts



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

**HALLOWEEN  
WEBINAR**

\*see page 17 for code & construction for the Hummingbird



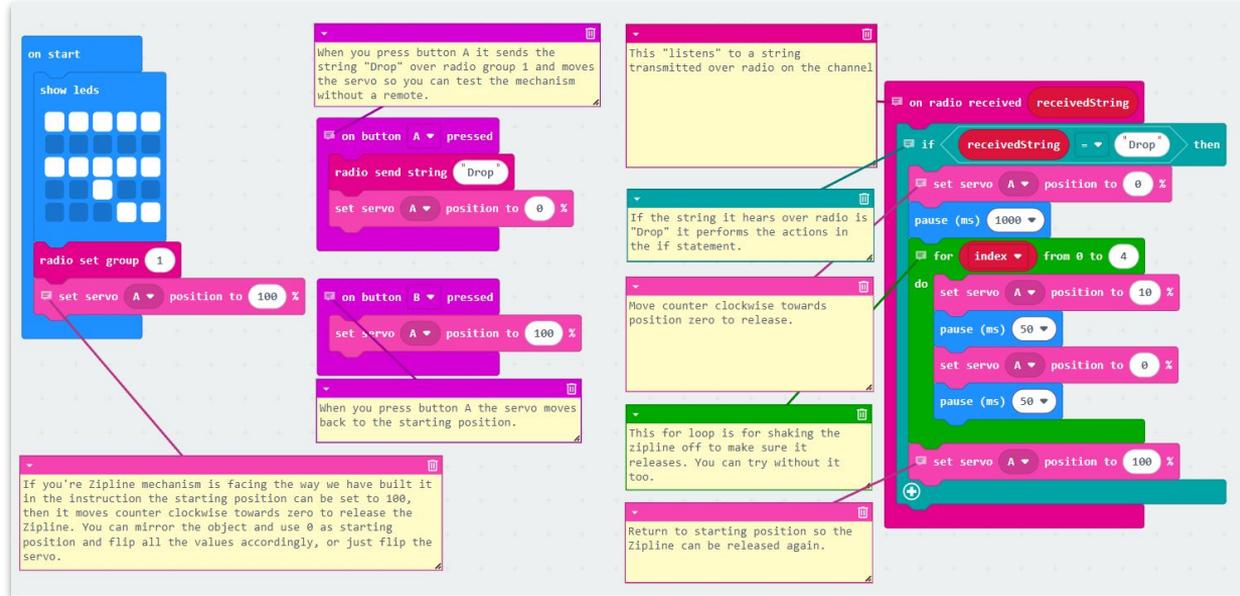
# Remote zipline

## 1. Program the micro:bit

1

Download the following code to your micro:bit or challenge your students to figure out the code.

<https://makecode.microbit.org/S61663-17038-72062-09404>



The code is written in the MakeCode editor and consists of the following blocks:

- on start**:
  - show leds
  - radio set group 1
  - set servo A position to 100 %
- on button A pressed**:
  - radio send string "Drop"
  - set servo A position to 0 %
- on button B pressed**:
  - set servo A position to 100 %
- on radio received receivedString**:
  - if receivedString == "Drop" then:
    - set servo A position to 0 %
    - pause (ms) 1000
    - for index from 0 to 4:
      - do:
        - set servo A position to 10 %
        - pause (ms) 50
        - set servo A position to 0 %
        - pause (ms) 50
    - set servo A position to 100 %

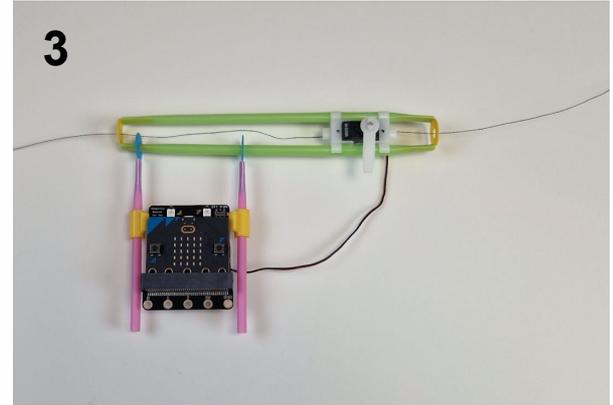
- Comments**:
- "When you press button A it sends the string 'Drop' over radio group 1 and moves the servo so you can test the mechanism without a remote."
- "This 'listens' to a string transmitted over radio on the channel"
- "If the string it hears over radio is 'Drop' it performs the actions in the if statement."
- "Move counter clockwise towards position zero to release."
- "This for loop is for shaking the zipline off to make sure it releases. You can try without it too."
- "Return to starting position so the zipline can be released again."

*HALLOWEEN  
WEBINAR*



# Remote zipline

## 2. Assemble launcher mechanism



Assemble the structure and attach the robotic inventions clip and servo. Thread the string through the yellow Strawbees. Make sure the servo arm is facing down in the starting position. Try pressing the a button so you can see that the arm moves counter clockwise so the zipline will be released towards the right.

**HALLOWEEN  
WEBINAR**

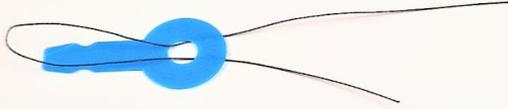


# Remote zipline

## 3. String ends



1



2



1. Fold the string ends and push through a single Strawbee.
2. Pull the loop over the Strawbee leg and then back across the Strawbee body and pull tight.
3. Secure with an extra knot if you want too.

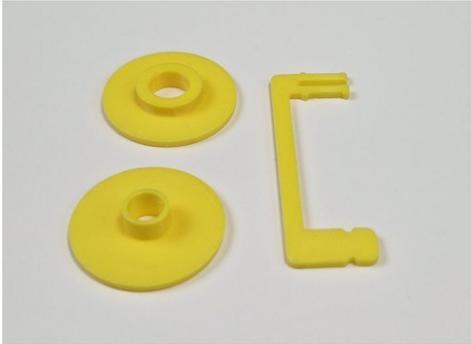
Do this for both ends of the String once you know how long the distance will be. If you don't have access to a 3D printer put a yellow straw on the right side of the string where the zipline is going to move.

**HALLOWEEN  
WEBINAR**



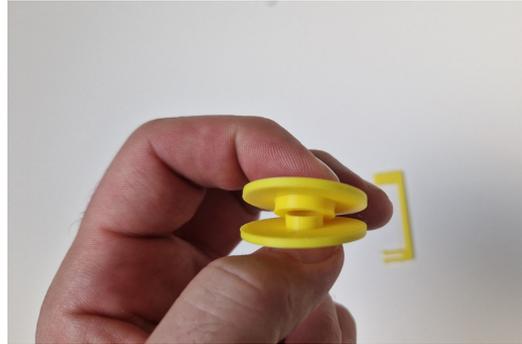
# Remote zipline

## 4.A 3D printed zipline pulley wheel



1. 3D print parts

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



2. Assemble the pulley wheel



3. Attach the body to pulley wheel.

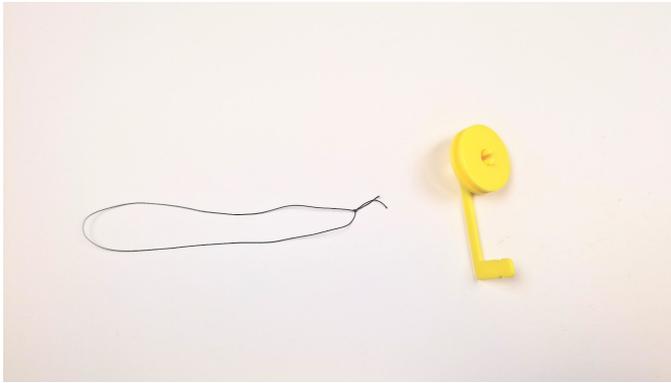


**HALLOWEEN  
WEBINAR**

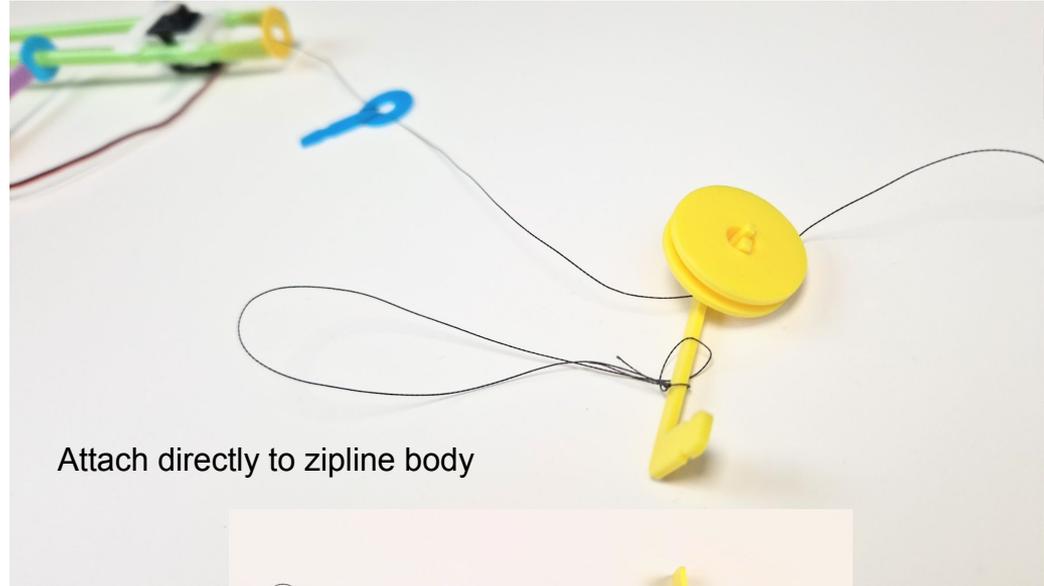


# Remote zipline

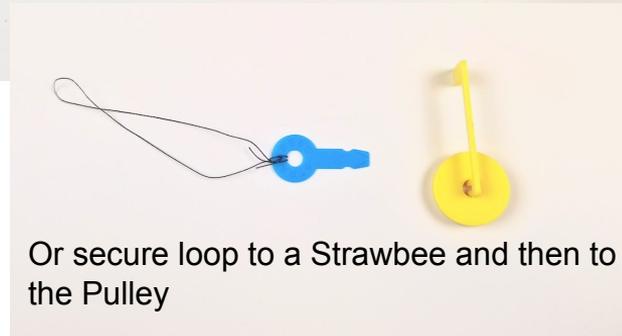
## 4.A 3D printed zipline pulley wheel



1. Make a string loop



Attach directly to zipline body



Or secure loop to a Strawbee and then to the Pulley

**HALLOWEEN  
WEBINAR**

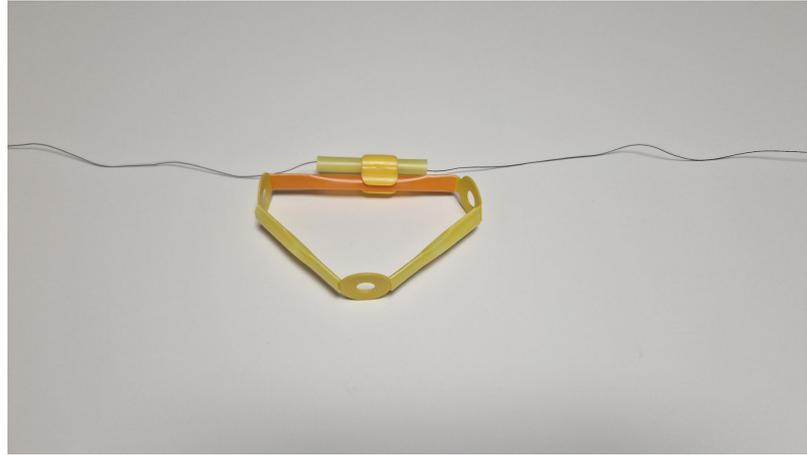


# Remote zipline

## 4.B Simple zipline slider



If you don't have a 3D printer you can make an OK zipline by putting a yellow straw on the string and making a structure to hang your scary objects from and connect it with a double sided clip.

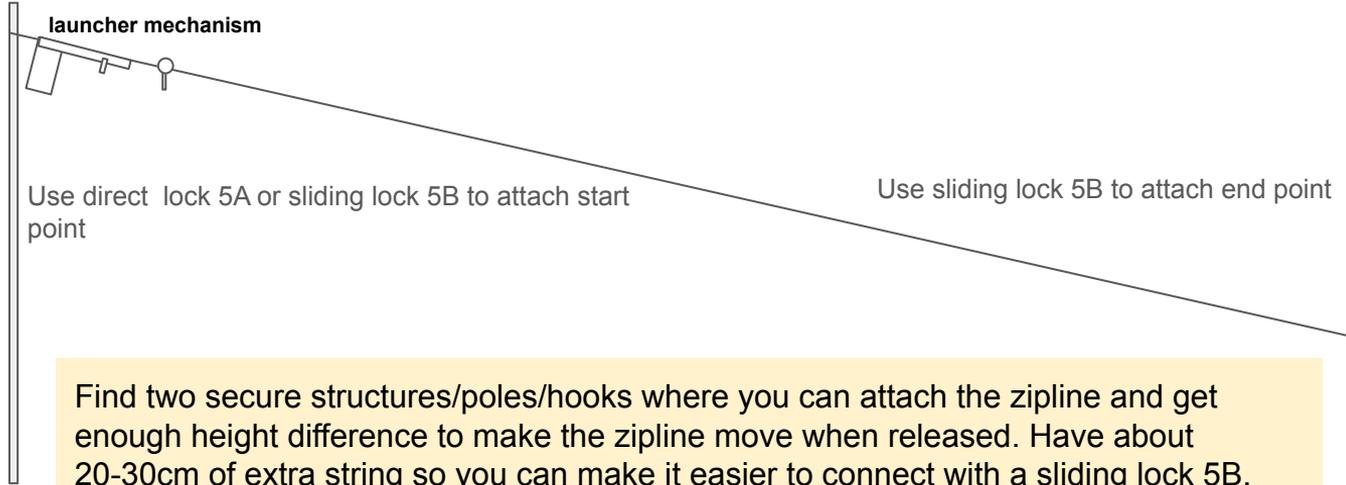


***HALLOWEEN  
WEBINAR***



# Remote zipline

## 5 Put the zipline up



**HALLOWEEN  
WEBINAR**



# Remote zipline

## Part 5B Direct lock



If you can reach the highest point you can directly connect the launcher mechanism end like this.

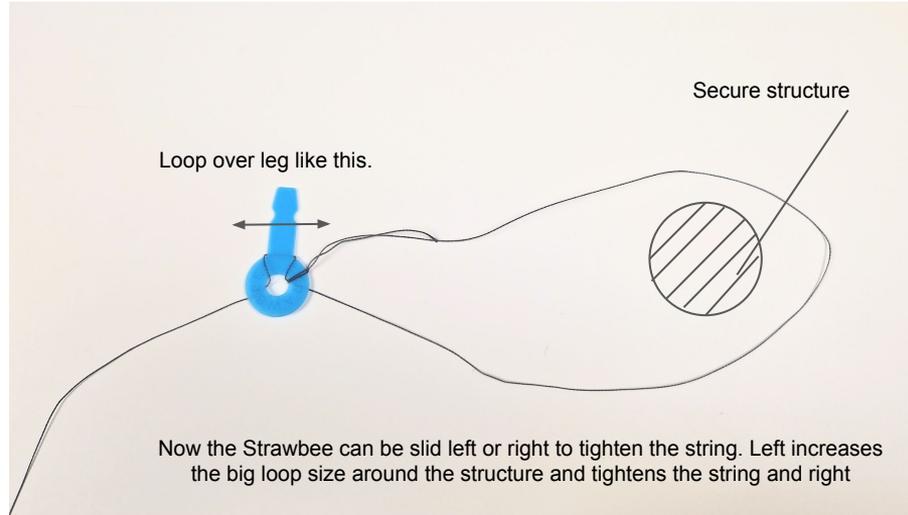
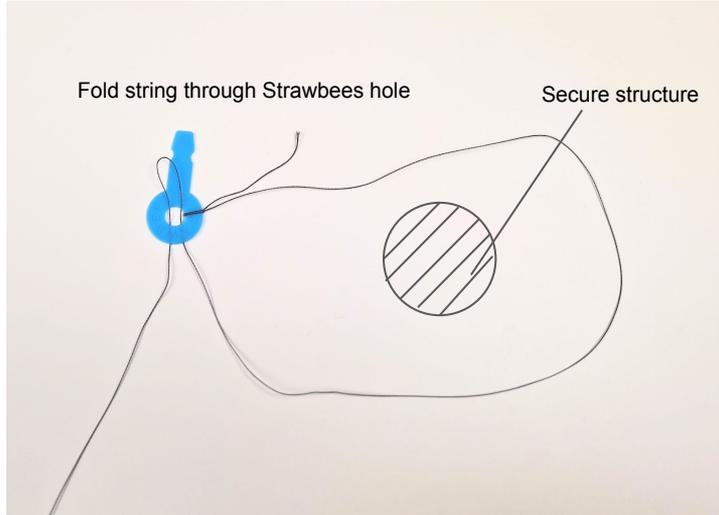
Otherwise use the sliding lock 5B

***HALLOWEEN  
WEBINAR***



# Remote zipline

## Part 5B Sliding lock



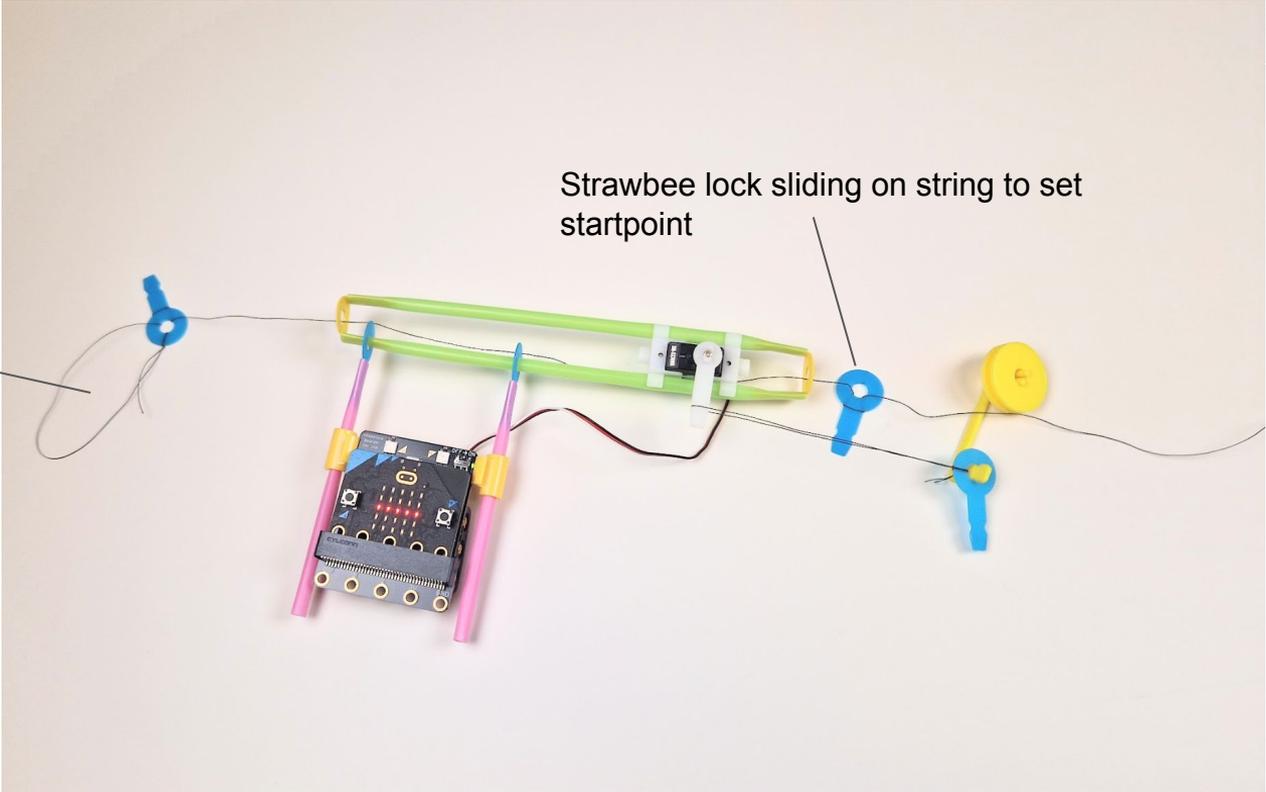
**HALLOWEEN  
WEBINAR**

Loop string around structure. Fold the string that goes towards the launcher mechanism and push over the leg. This is why it is good to have some extra length on the string. If it is too short it is quite hard to fold it over the leg.



# Remote zipline

5C Sliding lock start point



Sliding lock

Strawbee lock sliding on string to set startpoint

**HALLOWEEN  
WEBINAR**

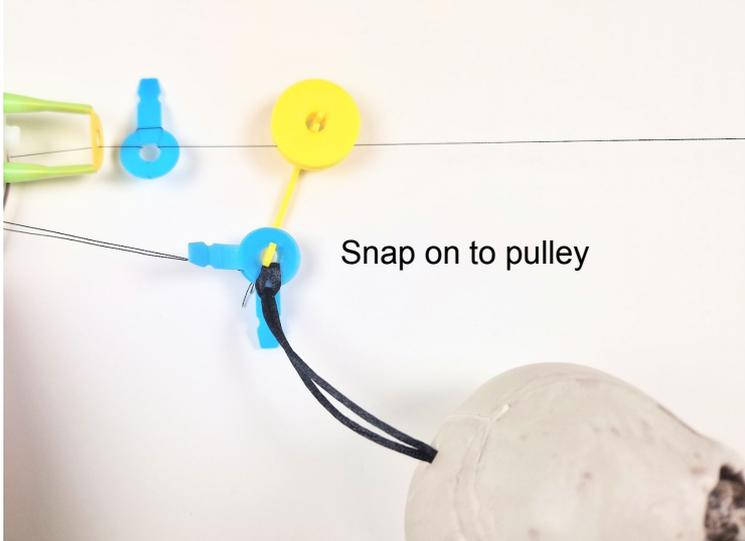


# Remote zipline

6 Attach spooky thing to zipline pulley



Secure Strawbee to spooky thing



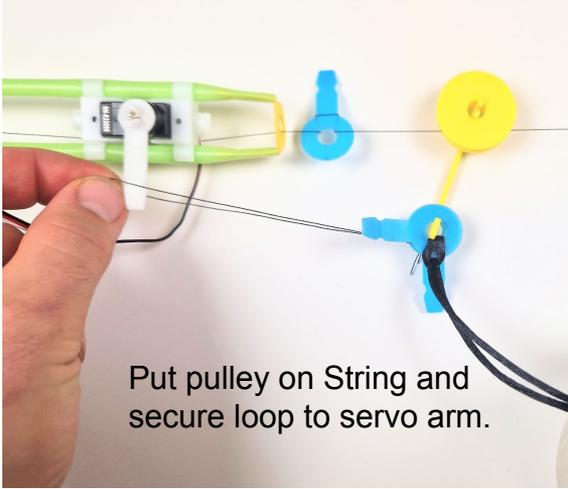
Snap on to pulley

**HALLOWEEN  
WEBINAR**

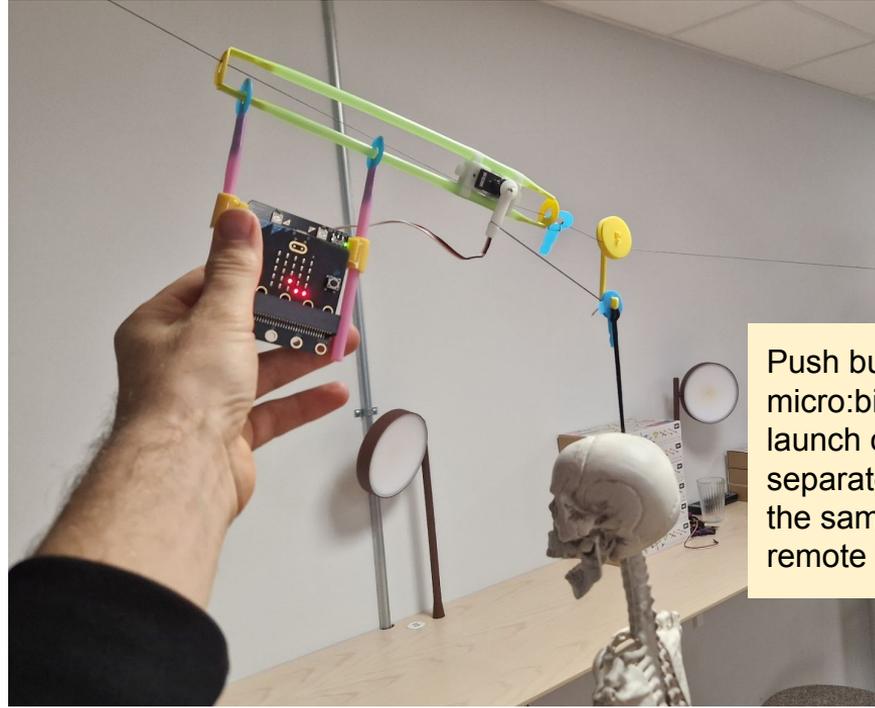


# Remote zipline

## 7 Test



Put pulley on String and secure loop to servo arm.



Push button A on micro:bit to use local launch or use a separate micro:bit with the same code to do remote launch.



***HALLOWEEN  
WEBINAR***



# Remote zipline

## 8 Scare someone



Remember to set it up somewhere where the “spooky object” can be hidden and then wait for the unsuspecting friend to arrive and use the remote to have some fun scaring them a bit.

If you are up for it replace the remote with a computer and teachable machine so you don't have to be there yourself and make it even more spooky..

***HALLOWEEN  
WEBINAR***



Strawbees®



Have fun & happy scaring!

***HALLOWEEN  
WEBINAR***



# Remote zipline

\*For the Hummingbird



## What you need



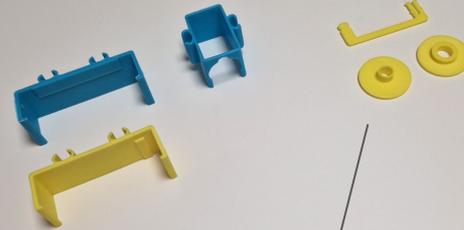
String



## Hummingbird & Position servo



## 3D printed parts



**HALLOWEEN  
WEBINAR**

<https://www.thingiverse.com/thing:6530669>

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



# Remote zipline

## 1. Program the micro:bit

### 1

Download the following code to your micro:bit or challenge your students to figure out the code.

<https://makecode.microbit.org/S99503-94347-33002-99494>



***HALLOWEEN  
WEBINAR***



```
on start
  Start Hummingbird
  show leds
  radio set group 1
  Hummingbird Position Servo 1 90

on button A pressed
  radio send string "Drop"
  Hummingbird Position Servo 1 175

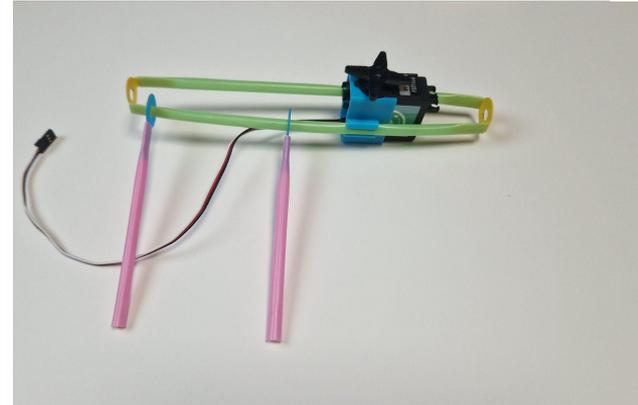
on button B pressed
  Hummingbird Position Servo 1 90

on radio received receivedString
  if receivedString = "Drop" then
    Hummingbird Position Servo 1 175
    pause (ms) 1000
    for index from 0 to 4
      do Hummingbird Position Servo 1 160
      pause (ms) 50
      Hummingbird Position Servo 1 175
      pause (ms) 50
    Hummingbird Position Servo 1 90
```



# Remote zipline

## 2. Assemble launcher mechanism



Assemble the structure and attach the Hummingbird clip and servo. Thread the string through the yellow Strawbees. Make sure the servo arm is facing down in the starting position. Try pressing the A button so you can see that the arm moves counter clockwise so the zipline will be released towards the right. Now you can go to step 3 (slide 5) and continue.

**HALLOWEEN  
WEBINAR**

