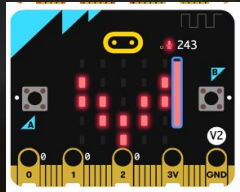


Week 7: MakeCode_micro:bit_UnitProject

EDTE 194

JBaribeau



micro:bit V2 Virtual Cat & Pal

micro:bit V2

Virtual Cat & Pal Design Brief

EDTE 194 Jbaribeau 10/17/2023



Overview

The micro:bit V2 virtual Cat & Pal is a great opportunity for students work with a partner. This project uses two micro:bits to create an interactive cat with an option to add a third micro:bit for the cats pal using sensors on the micro:bit to display words and/or icons.

Objectives

Students will be able to create a project that

- combines output using two micro:bit V2s
- seamlessly integrates the micro:bit V2 with a holder/shell/case
- use the following Blocks: Basic, Input, Variables, Logic, Radio, and Pins.

Target Audience

The micro:bit Virtual Cat & Pal project would be for 10th - 12th grade students who are enrolled in Art 2: Studio Crafts & Design and/or Elective: Exploring Computer Science courses



Prompts

The micro:bit Virtual Cat & Pal should include the use of:

- Sounds
- Icons
- External LED light
- External equipment (push buttons, 3rd micro:bit, extension board, motor,



Timeline Deliverables

The micro:bit Virtual Cat & Pal

- Introductions, Supplies, Design Brief, MakeCode, microbit V2 Download, Making the Shell/Case, Visual Diagram, Instructions, Video, Write-up with Reflection, and Feedback



Discussion

- Self-Reflection
- Gallery Walk
- Peer Feedback
- Instructor Feedback
- Think-Pair-Share



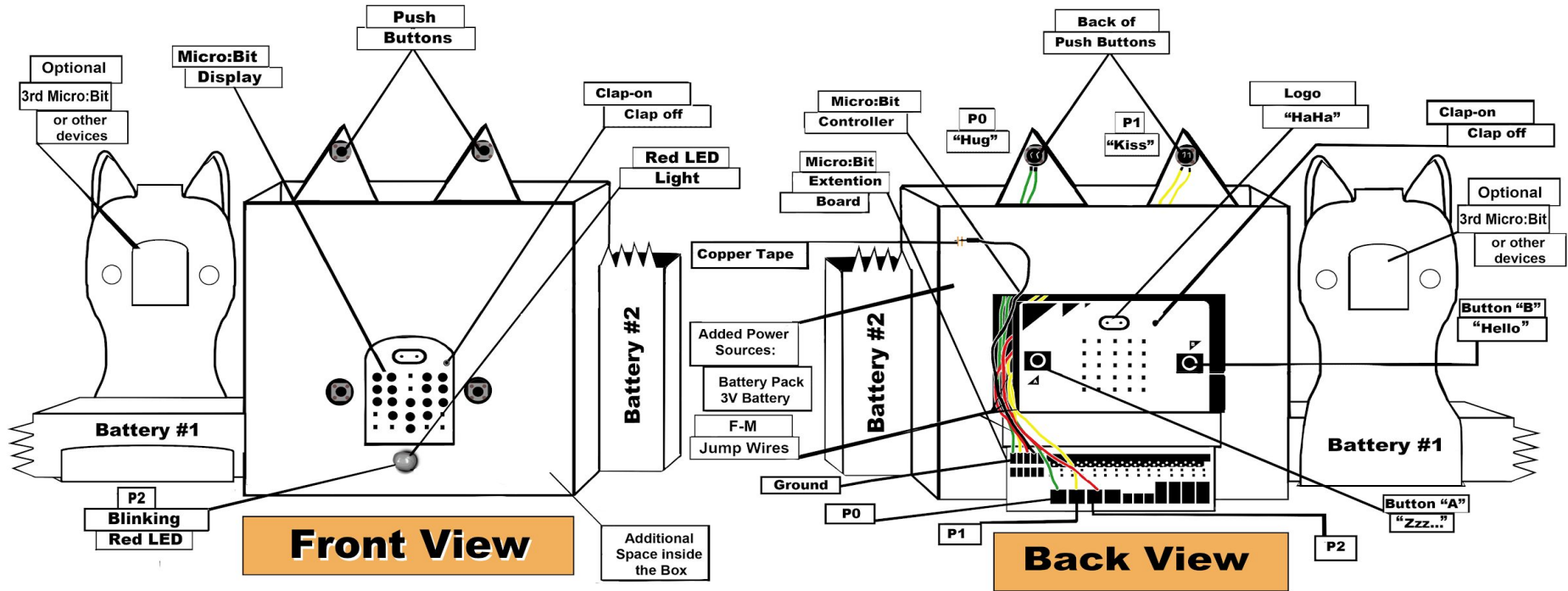
Budget

- 34 micro:bit starter kits - \$1,200
- 4 micro:bit ultimate kits - \$200
- 4 rolls of copper tape - \$30
- 100Pk legal file folders - \$25
- Class Pk color pencils - \$120
- 6 rolls of tape - \$20

- 60 glue sticks - \$20
- 30 rulers - \$20
- 36 black Sharpies - \$20
- 200Pk AA batteries - \$60
- 50Pk 9Volt batteries - \$60
- 60 piece alligator clips - \$80

Virtual Cat & Pal

micro:bit V2



EDTE 194
Micro:Bit Unit Project
JBaribeau



Video
Micro:bit
V2
Virtual
Cat & Pal

```
on start
  radio set group 1
  show leds
  set loud sound threshold to 128
```

```
on pin P0 pressed
  radio send string "Hug"
  play slide until done
```

```
on button A pressed
  radio send string "Zzz..."
  play sad until done

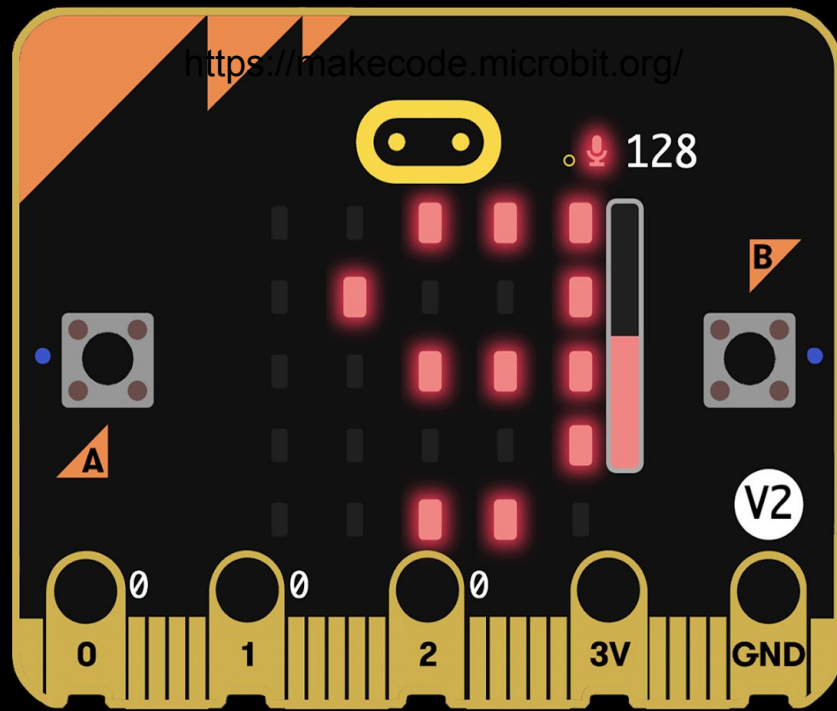
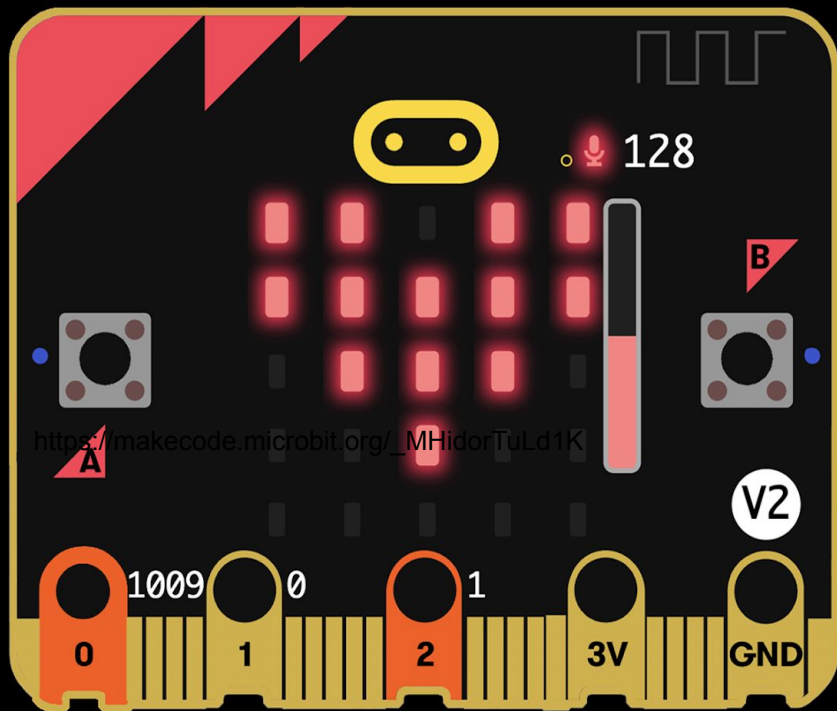
on radio received receivedString
  show string receivedString
```

```
on pin P1 pressed
  radio send string "Kiss!"
  play happy until done
```

```
on button B pressed
  radio send string "Hello"
  play hello until done
```

```
forever
  digital write pin P2 to 1
  pause (ms) 1000
  digital write pin P2 to 0
  pause (ms) 2000
  digital write pin P2 to 1
  pause (ms) 2000
  digital write pin P2 to 0
  pause (ms) 3000
```

```
on loud sound
  set lightsOn to not lightsOn
  if lightsOn then
    show leds
    on logo pressed
      radio send string "HaHa"
      play giggle until done
  else
    clear screen
```



Project File:

Hex File:

https://drive.google.com/file/d/112t98w2xfddQRoMZzZncDLbAK5zN20tB/view?usp=drive_link

MakeCode:

https://makecode.microbit.org/_CA2iq1Akq4Ku





micro:bit V2

Equipment

2 - micro:bit V2

2 - AA Battery Pack

1 - micro:bit Extension Board

2 - External Push Buttons

1 - External Red Led Light

1 - Copper Tape

7 - Jump Wire F-M

Virtual Cat & Pal

Optional Equipment

9V Battery

9V Battery Cable

3rd micro:bit V2

Segment Display

LCD Module

Additional Jump Wires or

Alligator lips

Materials:

File Folder

Glue

Clear Tape

Painters Tape

Scissors

Pencil

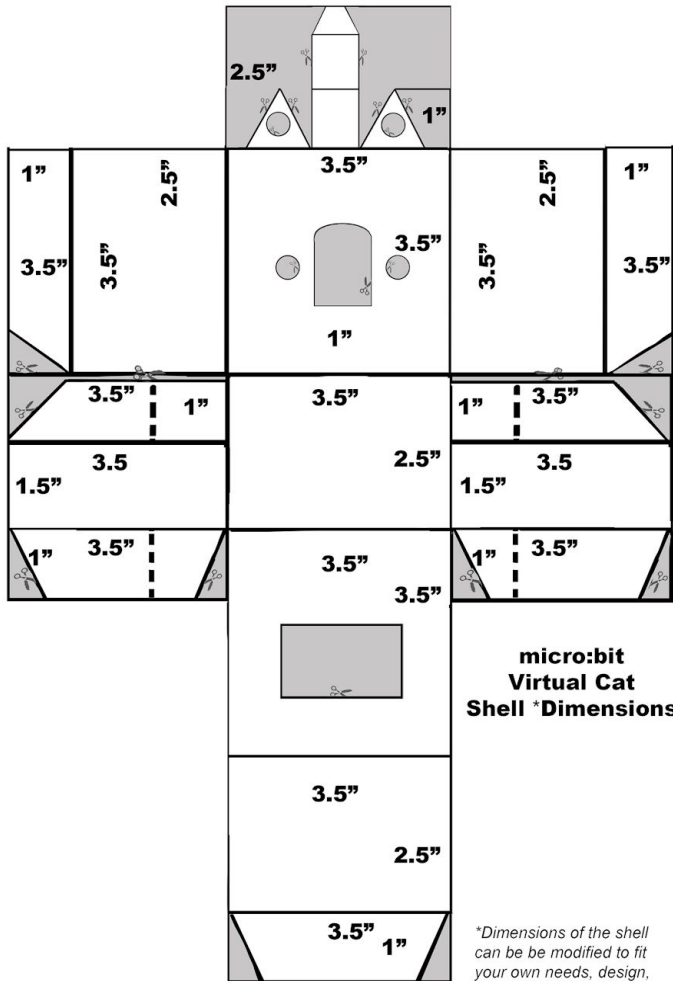
Eraser

Ruler

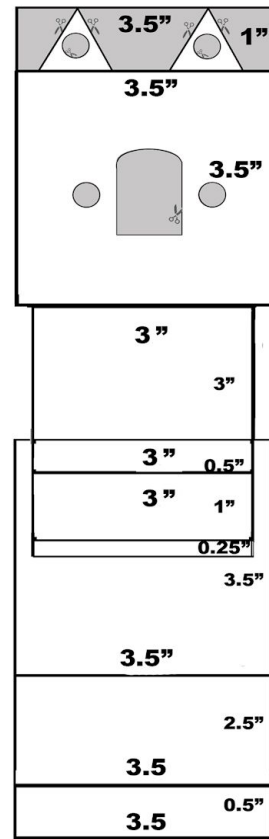
Color Pencils

Black Marker

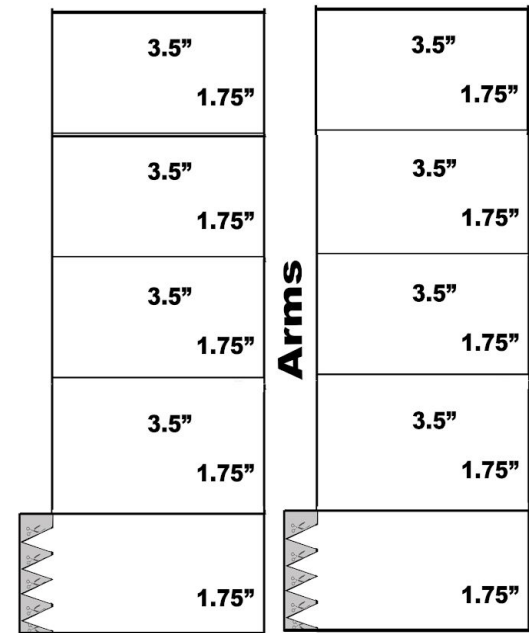


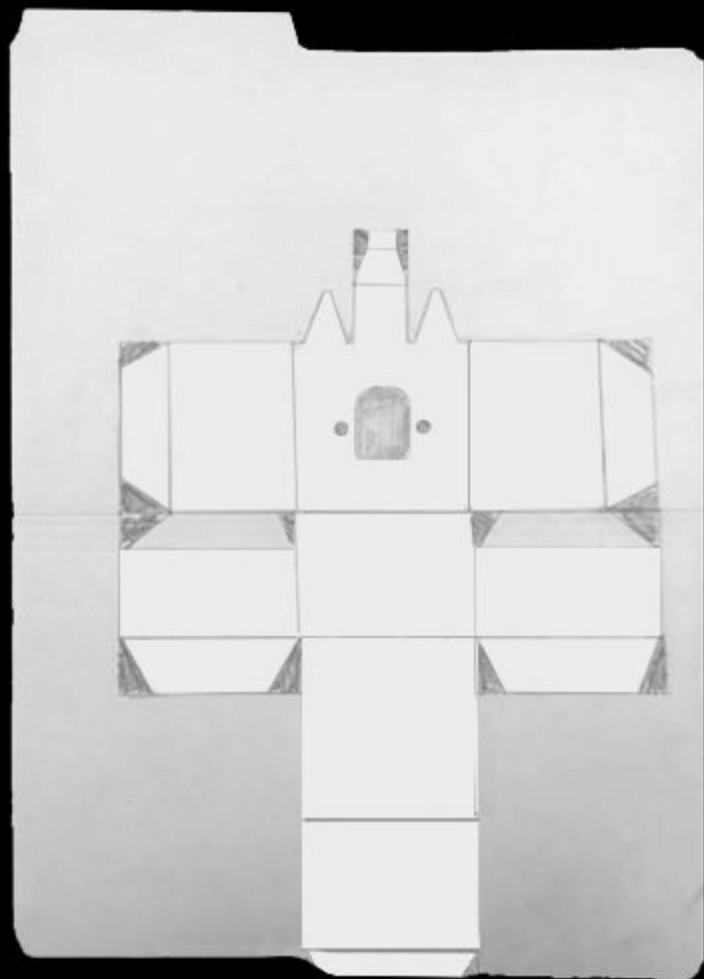


**Dimensions of the shell can be modified to fit your own needs, design, and/or equipment used.*

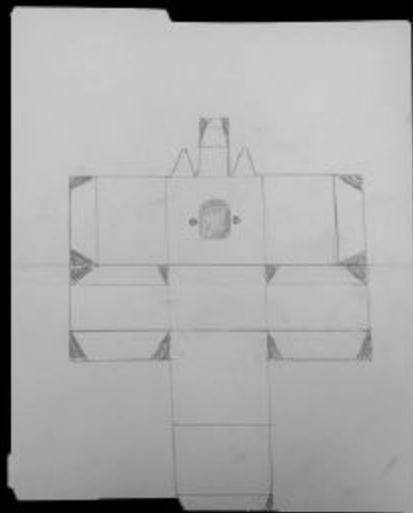


**Optional:
Virtual Cat Pal
Dimensions**





File Folder



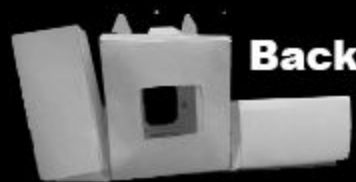
Body



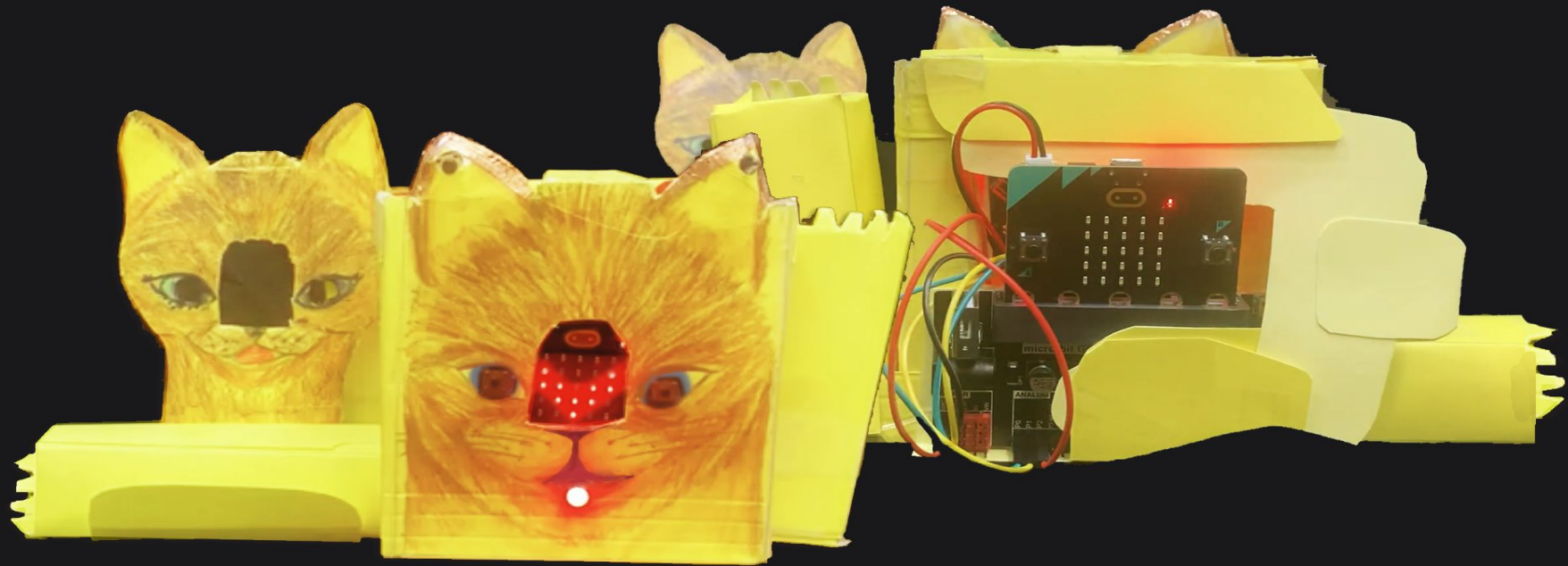
Arms



Front



Back



Instructions:

Use the back micro:bit to connect all jump wires used, and use the back micro:bit as the controller for the front micro:bit's LED Screen, Sound (including the external clap), External Ear Buttons, & External Red Led Light Tongue.

Using the back micro:bit

Press **Button A** to display Zzzz... with sound on the micro:bit LED display

Press **Button B** to display Hello with sound on the micro:bit LED display

Press **Logo** to display HaHa with sound on the micro:bit LED display

On Virtual Cat

Press **Right Ear Button** to display Hug with sound on the micro:bit LED display

Press **Left Ear Button** to display Kiss with sound on the micro:bit LED display

External Sound

Clap Your Hands to display a heart-like shape on the micro:bit LED display

Reflection

What kind of Project did you do?

I chose to do a Virtual Pet for my micro:bit Unit Project

How did you decide what to pick?

If you look at my **Project Idea Resources** section above, you will see that I research a few different types of projects: Games, Radio, Music, Robot, and Virtual Pets. During my research, the virtual pet inspired me. I liked the idea of having two micro:bit that talk to each other. I decided to create my own version. I still have the micro:bits talk to each other, but decided to have the back micro:bit be used as the main controller, so the front one displays the information.

**How does your project use external equipment?
I added the following external equipment to my project:**

- a 2nd micro:bit to be used as a radio. This allowed the back micro:bit to be like a controller for displaying information on the front micro:bit
- an external push button on each ear of the cat to display information on the front micro:bit
- an external red led light to represent a tongue. I programmed the led light to blink on and off for different intervals of time. a Clap function to the programming to turn on and off a heart-like icon on the front micro:bit display
- I added an external extension board because I felt that the alligator clips were too cumbersome and didn't function the way that I thought would work with my design.
- a removable Cat-cutout that could be used for additional external equipment: 3rd micro:bit , Segment Display, LCD Module, etc...

...Continued reflection

Describe something in your project that you are proud of.

Overall, I liked my design of the Virtual Cat with the arms that hide the battery packs, the removable second cat for the possibility of adding additional external equipment and programming.

In addition, I liked that I was able to take inspiration from YouTube Videos on micro:bit virtual pets and really make it my own by changing the code and programming mine to work in a different way and even more advanced than the resources I looked at.

Describe a difficult point in the process of designing this program and explain how you resolved it.

I really struggled with some of the wiring using alligator clips. I opted to purchase f-m jump wires & an extension board which really helped me make the connections better. I felt that it was a cleaner less cumbersome way to make the connections in my design.

Finally, I really struggled with figuring out how to make the ears have a pressure point to connect additional programming options to using the PO and P1 connections. I looked at the Piano projects & the Operation Game projects to try and help me figure it out.

...Continued reflection

However, in my research, I really struggled to find adequate information especially visual diagrams and/or examples of the circuit/wire connections from the micro:bit. In the end, I decided to purchase external push buttons to allow for more options to be displayed on the micro:bit.

I did discuss this with you during our last Zoom Class, and I now have a better understanding of how I could have utilized the aluminum foil and/or copper tape with alligator clips or jump wires using an additional power source. If time permits, I may try this on my own at a later date.

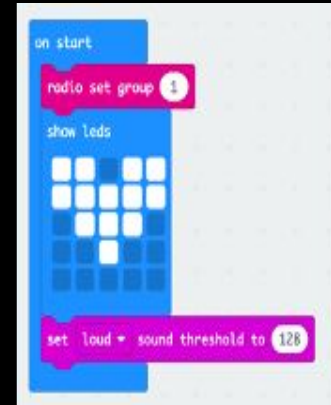
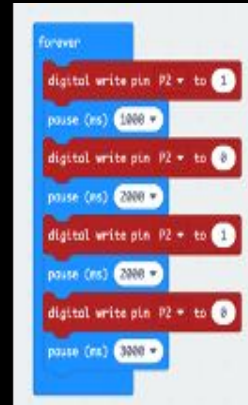
What feedback do you hope to get from other students during the in-person class?

- Input on the design of the Virtual Cat
- Do they like the option of the additional removable cat to add additional devices and programming to the virtual pet.
- Feedback on the programming
- What would they have done differently to change or improve the programming?
- Did they like the additional Clap-on, Clap-off programming? Why or why not

Some Project Ideas and Resources

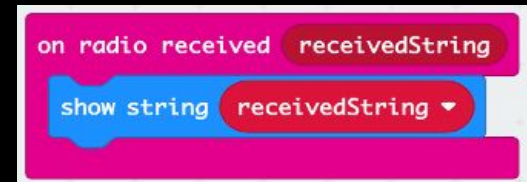
1. Stop, Thief!

- a. a. Design an alarm system for your bedroom that alerts you with a screen animation when someone opens your door. You can mount one micro:bit on your door and use the accelerometer to send a signal over the radio when it is being moved.



2. Interactive Art

- a. Create a piece of interactive artwork that receives something as input over the radio from another micro:bit and displays something based on that as output.



Resources:

Project Ideas: I researched different projects to find something of interest that would inspire me when developing and creating my micro:bit Unit Project.

Game 1:

<https://youtu.be/DgJ-S0q0EMs?si=qgaSqUUYma69IpUX>

Game 2:

<https://youtu.be/OzWSRXqOBeO?si=W07a9COGIh0GzOCL>

Game 3:

<https://youtu.be/-I4cy9Wb59A?si=a1D7AsCXTRkIMW3K>

- o <https://youtu.be/5peXIXZSLk?si=hdIngIEDJPFovDz3>
- o https://youtu.be/tnjcGJeY_5A?si=62_25rH_bPmR88YS

Robot 1:

<https://youtu.be/UDipmKUee2A?si=KG9SiIvY8qGL-OLV>

Robot 2: https://youtu.be/Y63toNEMoRA?si=dejf7_kX4uJ0OSP-

Radio 1:

https://youtu.be/SHMJTulOpJM?si=XJXm0URx7P_s-mk9

Radio 2:

https://youtu.be/Re3H2ISfOE8?si=NrL4BUucq_IzHR8A

Radio 3:

<https://youtu.be/UoTk0P3Bx1w?si=bb3YoBmTMTdmknwl>

Music:

<https://youtu.be/YU6rJeH6ZPM?si=YEw-XKbZPtUcmlb6>

Interactive Pet:

<https://youtu.be/s0pl6J9EozE?si=O8XqFI3cBCUUiJWg>

- o https://youtu.be/EmHZkYfHpcw?si=E_MPPq00GSx4ZucP
- o https://youtu.be/-HzAYE9EDq8?si=lugcH86_BfDk55PM