



# North Vista Primary School

Pei Hwa Virtual Hackathon 2022

# Problem Statement

## Identify the problem to be solved

Expectations to perform well at school are a known source of stress for students in Singapore. Negative family environment, trauma, social isolation and discrimination etc could cause fear and anxiety in students. The COVID-19 pandemic has presented many challenges to students. Routine disruption has resulted in increased distress and mental health problems. Mental health problems can affect a student's energy level, concentration, dependability, mental ability, and optimism, hindering their performance. ADHD, anxiety problems, behavior problems, and depression are the most commonly diagnosed mental disorders in students in Singapore.

# Aim

Our team suggests to build a pet-buddy that will help students to learn how they can better support themselves emotionally and socially. The pet-buddy will pick up signs of distress and provide support and guidance to the students.

In alarming cases, the pet-buddy will trigger a connection to the school counsellor using bluetooth, who will then further provide individual evaluation, assessment and counselling to the student.

The aim is to enhance social and emotional competency and build resilience, guide and reinforce positive behaviors and thinking in young children. This will help to ensure a positive, safe school environment for all students.

# Ideation Process

Students will check-in their feelings in daily basis and the pet has a database that will collect, store and keep track of the student's daily emotion.

The pet-buddy will guide student to do the 4-7-8 breathing exercise. The 4-7-8 breathing technique, also known as "relaxing breath," involves breathing in for 4 seconds, holding the breath for 7 seconds, and exhaling for 8 seconds. This breathing pattern aims to reduce anxiety and stress.

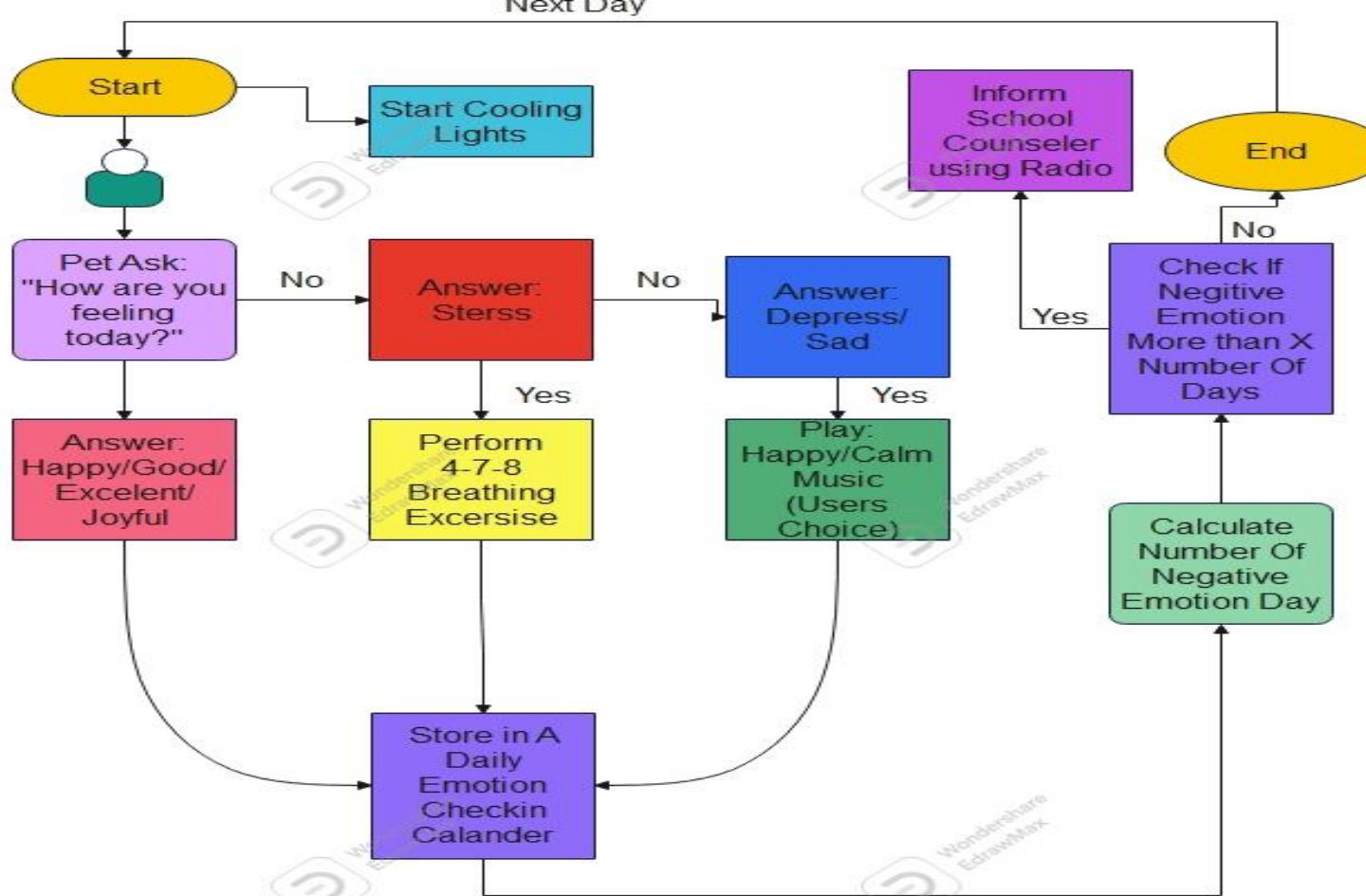
Our pet-buddy can play happy music for students who are depressed or sad and play calming music for students who are feeling angry.

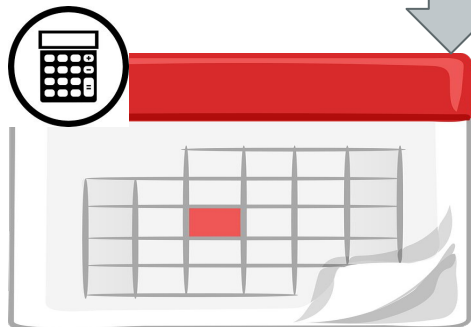
Our pet-buddy would provide additional motivational advices to the students when they are feeling negative.

Negative feelings include stress, depressed, sad and angry (more emotions can be added).

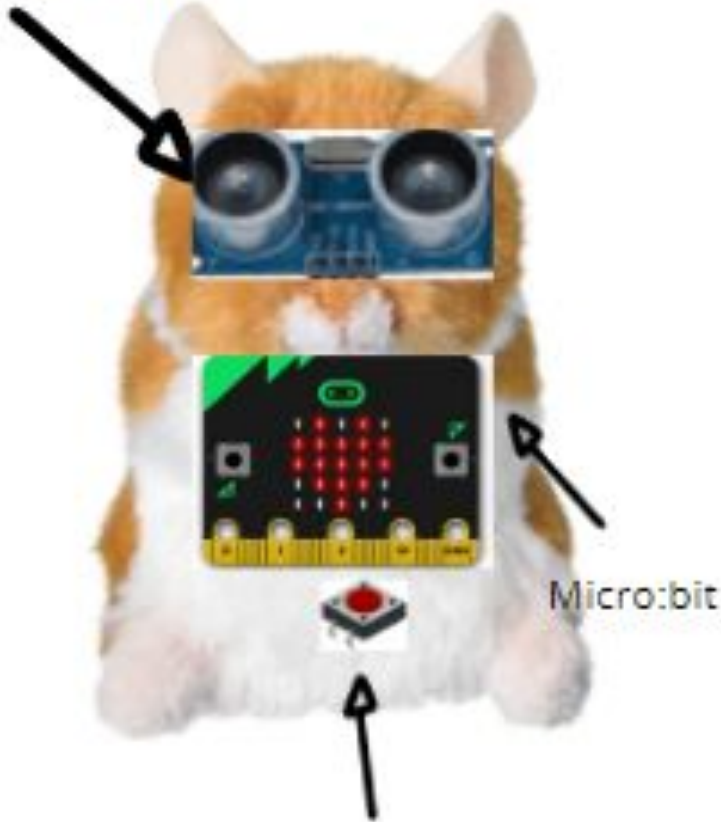
If the number of negative emotion is more than X days, the pet will trigger a connection to the school counsellor using radio.

# Concept Map Of the Pet





Ultra Sonic Sensor  
For Petting



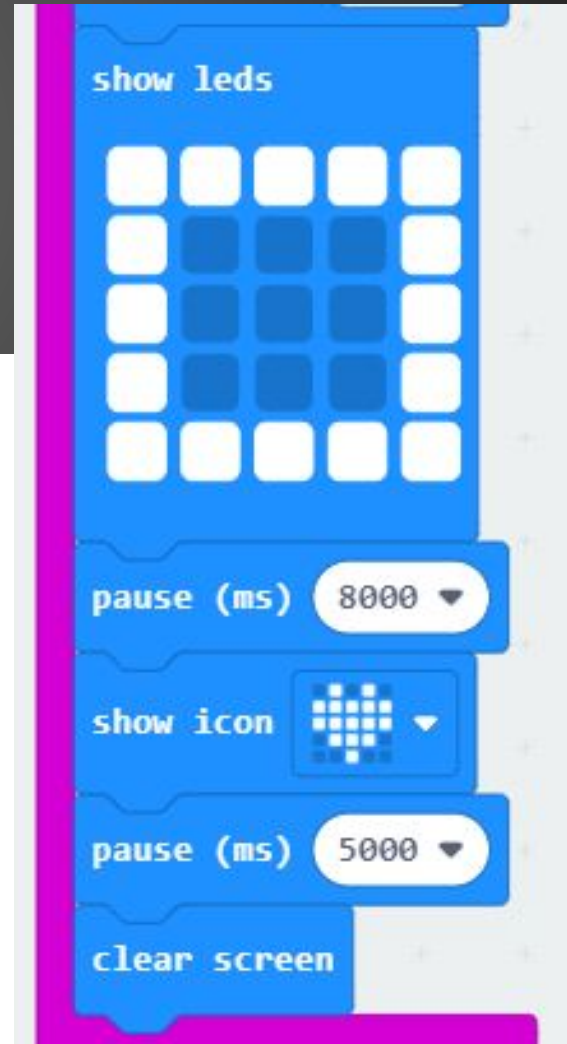
Micro:bit

Microbit External Button

# Prototype Digital View

# Micro:bit

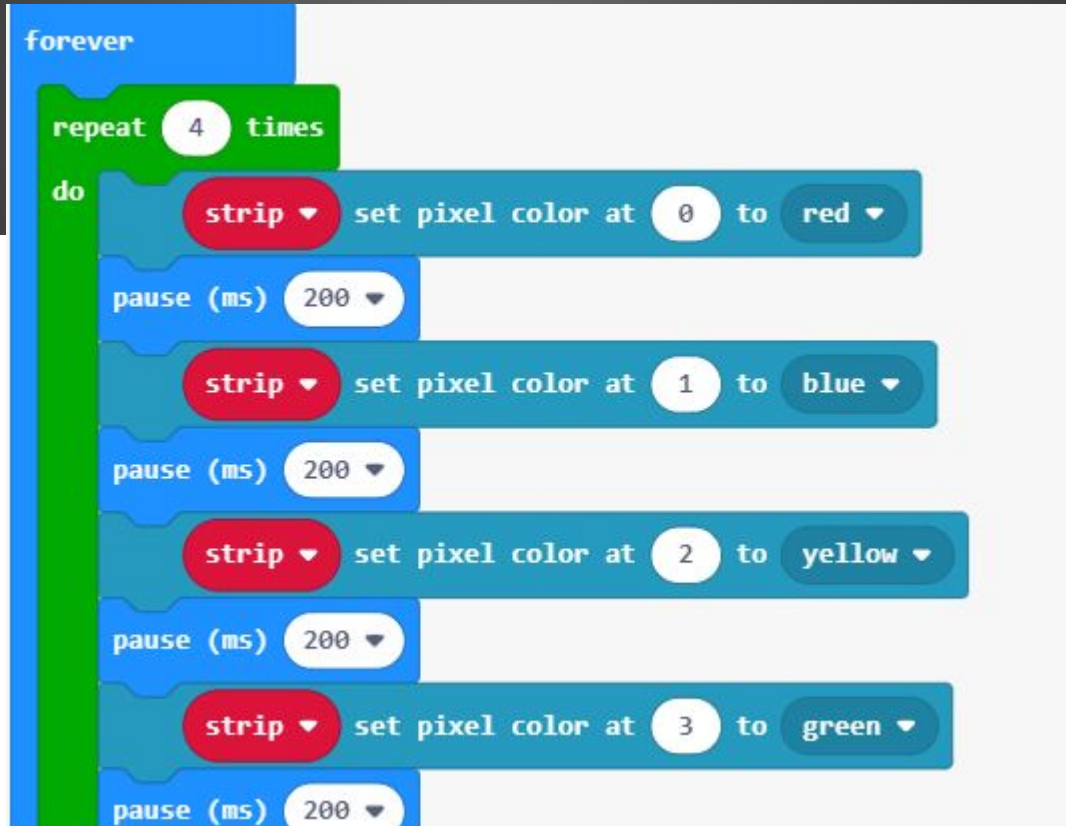
## Breathing Exercise Code



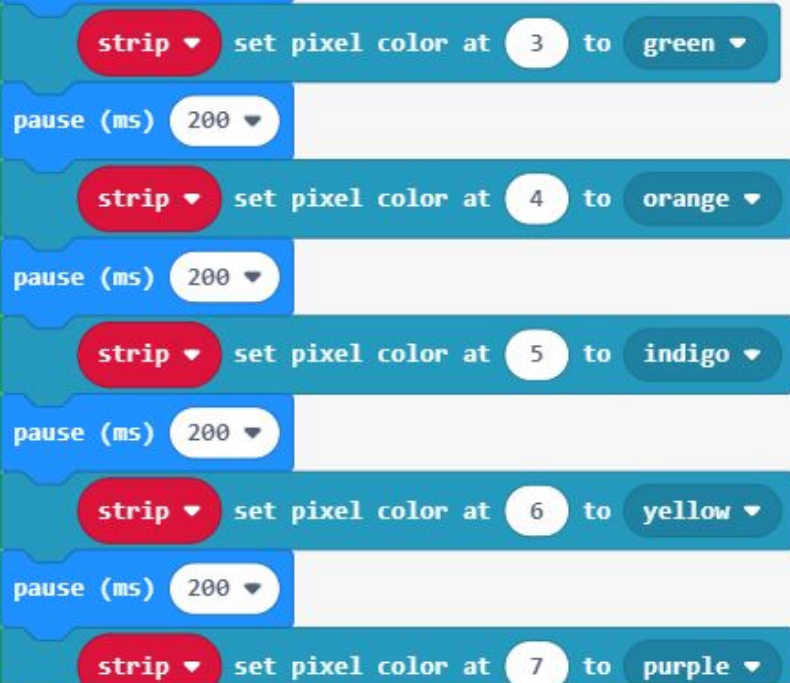


# Micro:bit

## Code for cooling lights

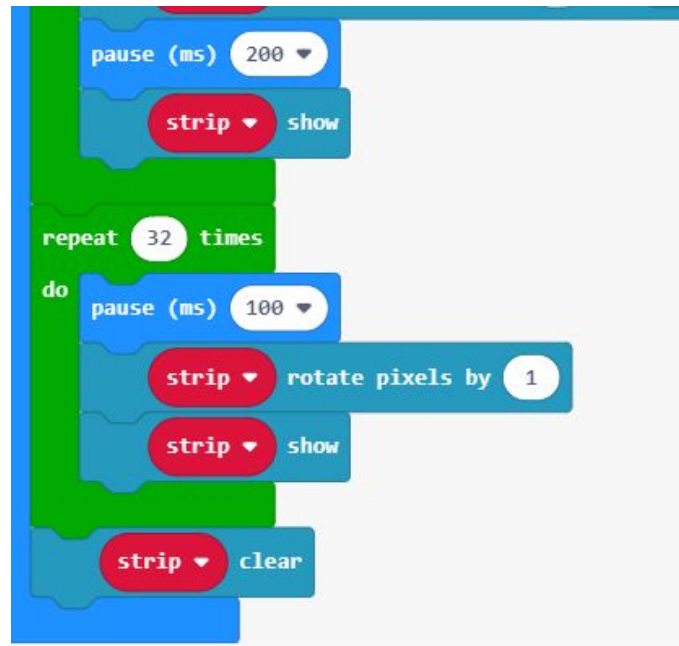


# Micro:bit



A Scratch script for a Micro:bit LED strip. It consists of five blocks, each with a 'strip' block, a 'set pixel color at' block, and a 'pause (ms)' block. The colors are green, orange, indigo, yellow, and purple, corresponding to the rainbow colors. The pixel indices are 3, 4, 5, 6, and 7 respectively.

```
strip ▾ set pixel color at 3 to green ▾  
pause (ms) 200 ▾  
strip ▾ set pixel color at 4 to orange ▾  
pause (ms) 200 ▾  
strip ▾ set pixel color at 5 to indigo ▾  
pause (ms) 200 ▾  
strip ▾ set pixel color at 6 to yellow ▾  
pause (ms) 200 ▾  
strip ▾ set pixel color at 7 to purple ▾
```

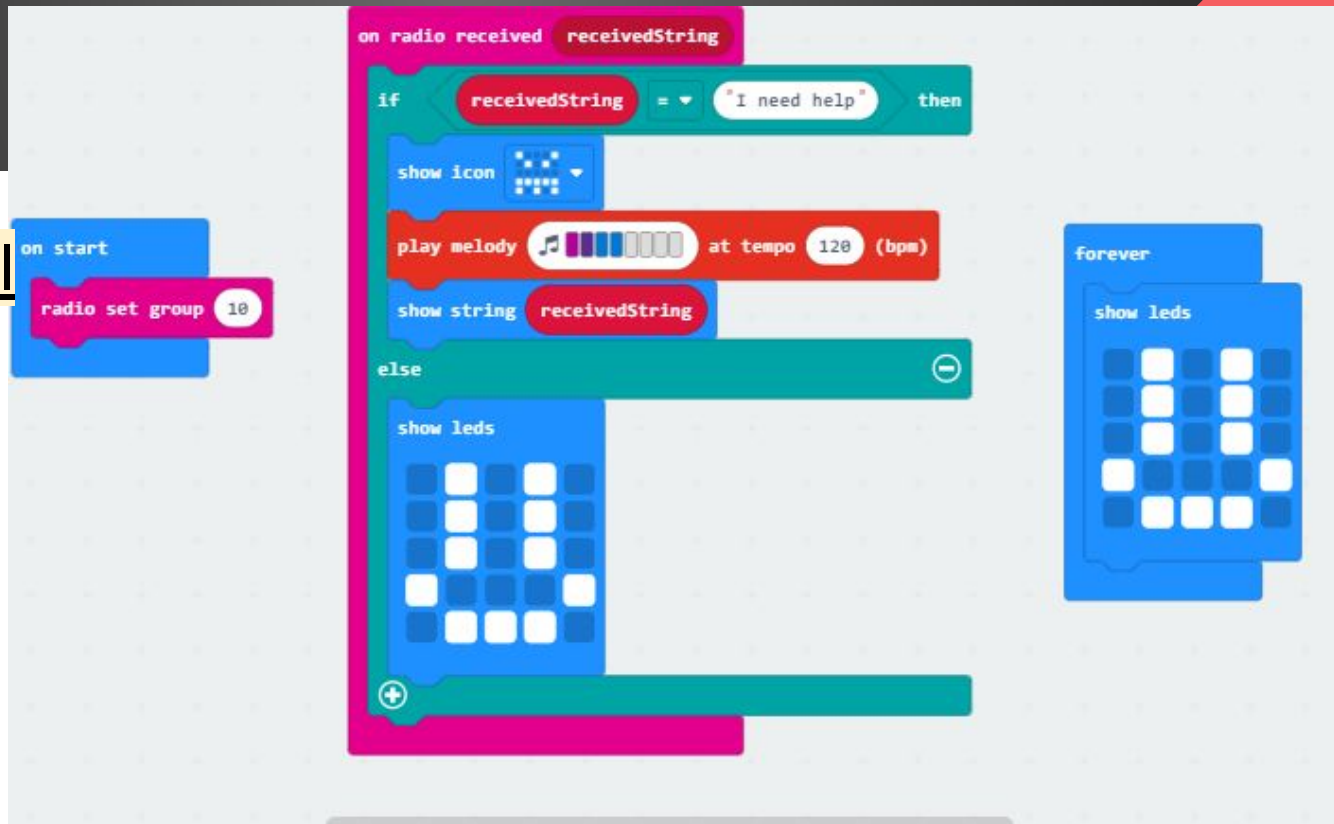


A Scratch script for animating a Micro:bit LED strip. It starts with a 200ms pause, then shows the strip. A 'repeat 32 times' loop contains a 100ms pause, a 'rotate pixels by 1' block, and a 'show' block. After the loop, the strip is cleared.

```
pause (ms) 200 ▾  
strip ▾ show  
repeat 32 times  
do  
  pause (ms) 100 ▾  
  strip ▾ rotate pixels by 1  
  strip ▾ show  
strip ▾ clear
```

# Micro:bit

Connect to school  
counselor code



# Micro:bit

## Emotion Check-in Code



# Micro:bit

## Calm Music Code

**Micro:bit**

# Micro:bit

## Petting Code



# Micro:bit

## Happy Music Code



**Micro:bit**

**Thank You For Listening**

