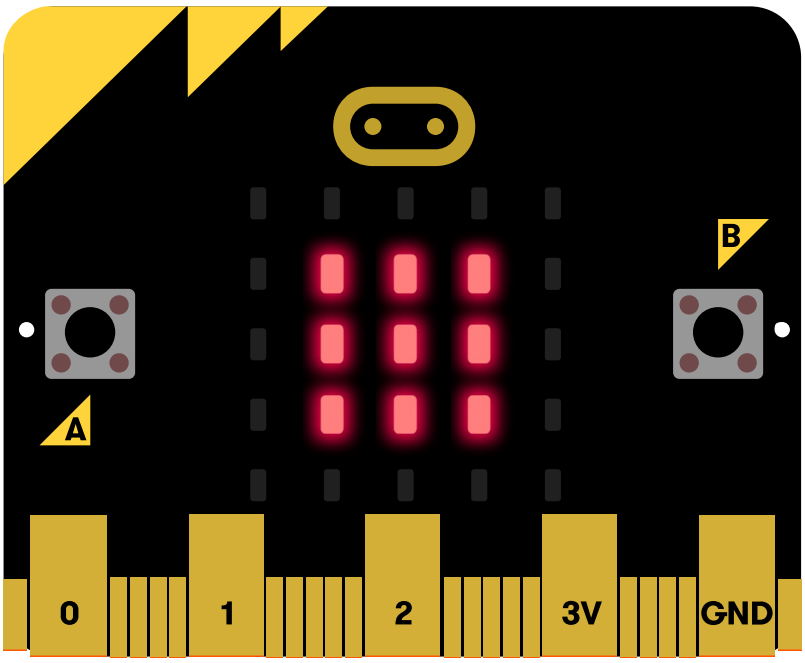
Reaction

Introduction

You are going to create a 2-player game to see who has the fastest reactions. The game will work by showing an image after a random amount of time - whoever presses their button first is the winner.



Resources

For this project, the MakeCode (PXT) microbit editor should be used.

Learning Objectives

- Boolean operators:
  - AND;
  - NOT.

Challenges

- "Choose your own image" - changing the image displayed on the micro:bit.
- "Choose your own delay" - changing the parameters to the `random` function.
- "Keep score" - use variables to keep track of player scores.

Step 1: Wait for it!

Let's start by displaying an image after a random amount of time.

Activity Checklist

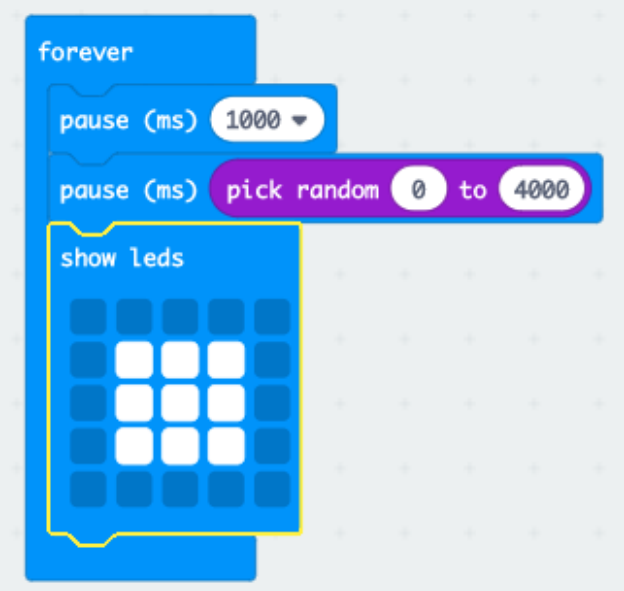
- [ ] Go to rpf.io/microbit-new to start a new project in the MakeCode (PXT) editor.
Call your new project 'Reaction'.

- [ ] Before displaying an image, the game should wait for a random amount of time.
Drag a `pause` block into the `forever` block and change the pause time to 1000 ms:

- [ ] Add another `pause` block and then drag a `pick random` block to `pause` block and set its value to 4000:

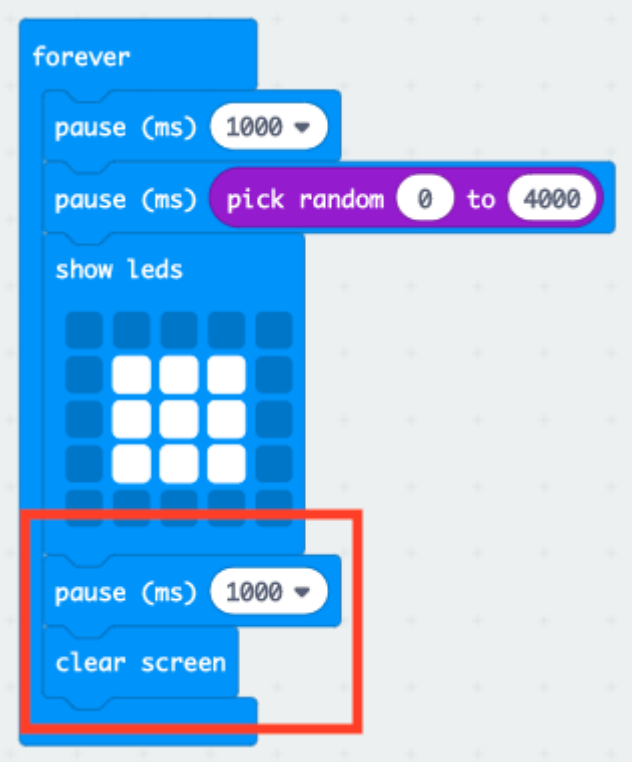
Remember that 1000ms is 1 second, so there will be a pause of at least 1 second up to a maximum of 5 seconds (1000 + 4000 ms).
You can change the '1000' and '4000' numbers to change the minimum and maximum pause if you like.

- [ ] After waiting, your game should show an image so that players know when to press their button.



- [ ] Click 'run' to test your project. You should see your image appear after a random delay.

- [ ] Add code at the end of the `forever` loop to display your image for 1 second and then clear the display.



- [ ] Test your project. You should see your image appear randomly and then disappear.

Challenge: Choose your own image

Can you change the image that's displayed?

Challenge: Choose your own delay

Change the numbers in your `random` block. You can speed up your game to make it harder, or slow it down to add suspense!

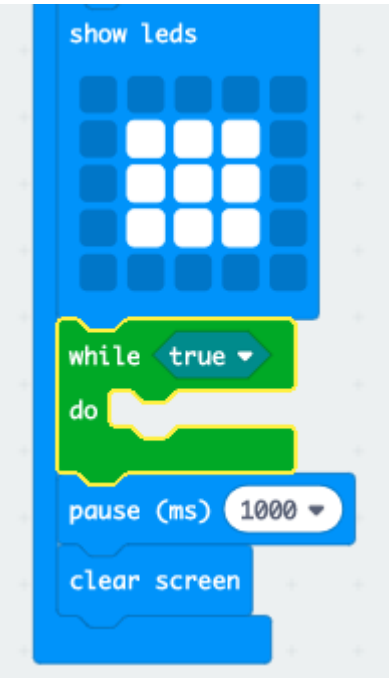
Step 2: Waiting for a winner

Let's add code to wait until a button is pressed.

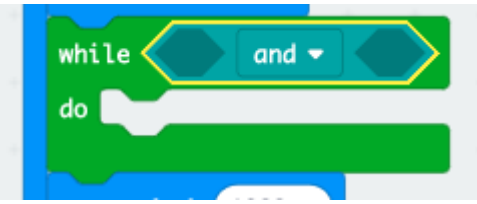
Activity Checklist

- [ ] After displaying an image, you'll need to wait until someone presses their button. Another way of saying this is that you'll need to wait as long as button A **and** button B have **not** been pressed.

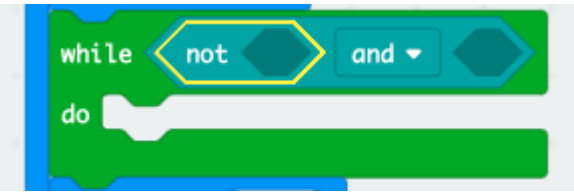
  To do this, add a `while` loop from the 'Control' section. The `while` loop should be added in just after the `draw` block.



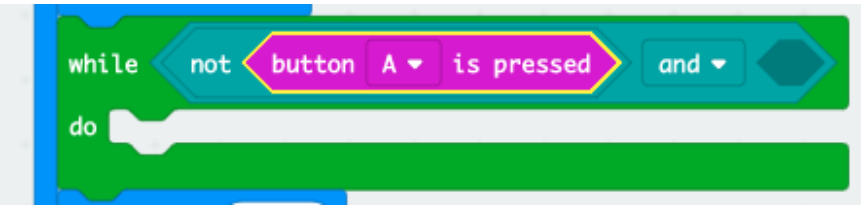
- [ ] Drag an `and` block from 'Logic' to your `while` block:



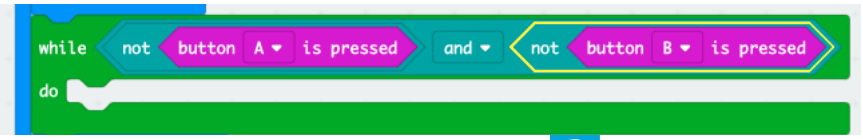
- [ ] Drag a `not` from 'Logic' into the left hand side of the `and`:



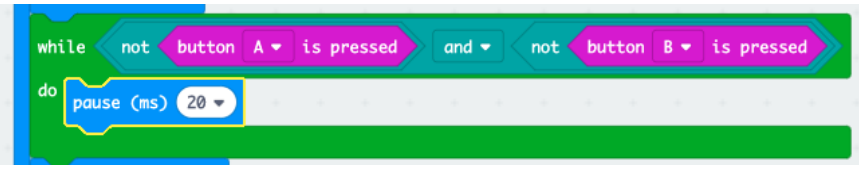
- [ ] Drag a `button A is pressed` block from 'Input' to after the `not`:



- [ ] Repeat the 2 steps above to add `not button B is pressed` into the `right` side of your while loop.



- [ ] You can then add a very short (20ms) delay, so that your `while` loop waits as long as a button hasn't been pressed.



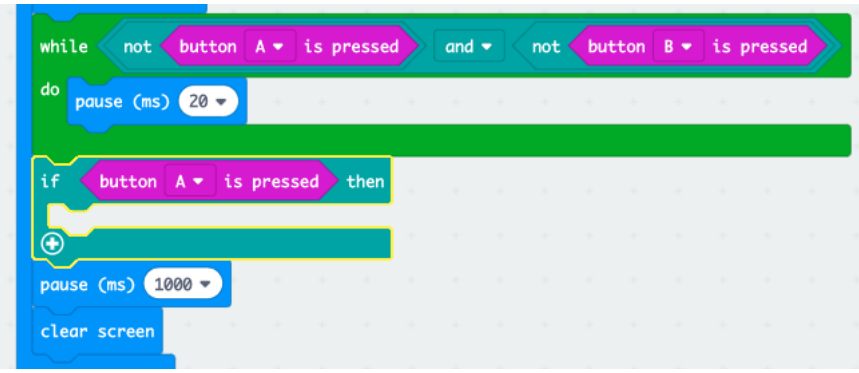
- [ ] Test your project. Your game should now display an image and then wait as long as buttons A **and** B have **not** been pressed.

Step 3: Who is the fastest?

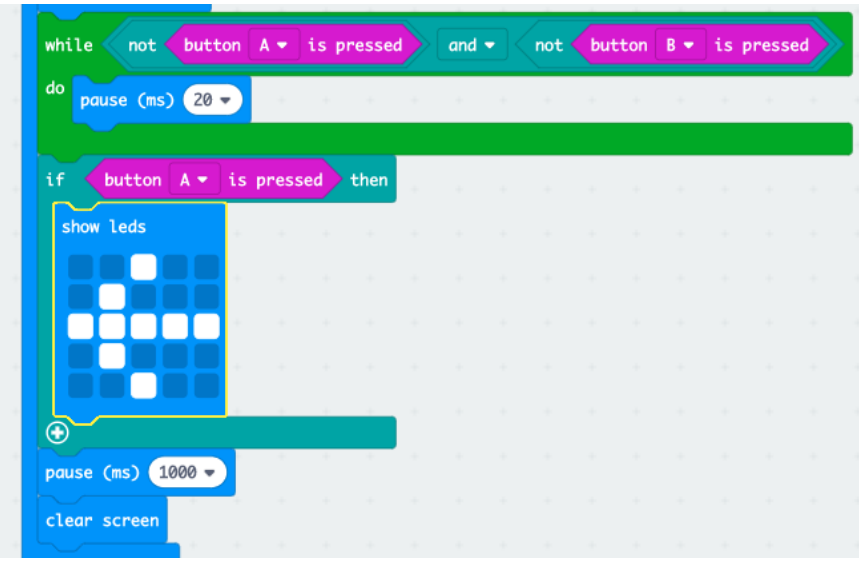
Let's find out who pressed their button first.

Activity Checklist

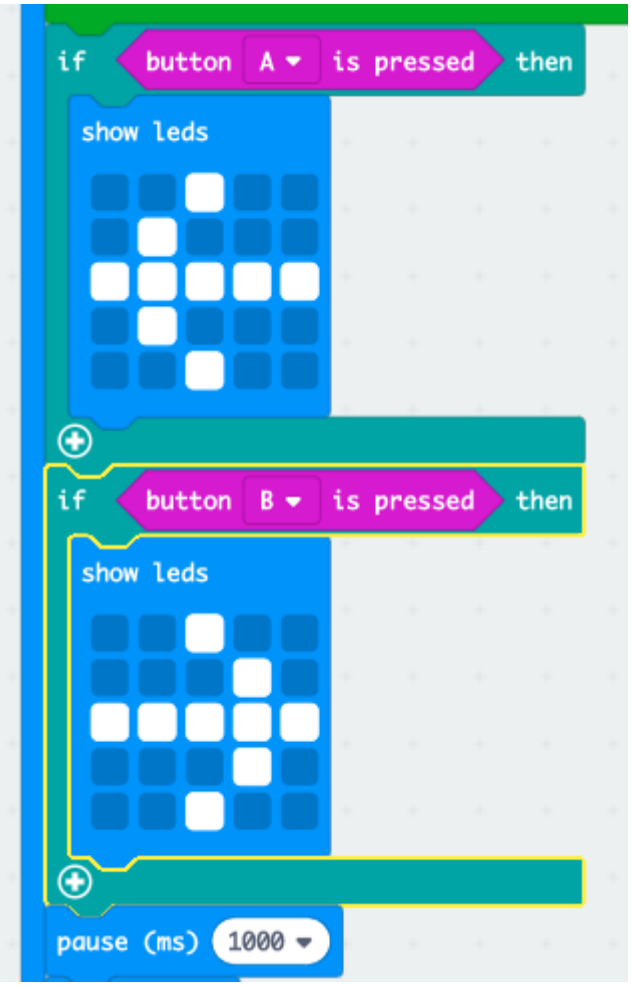
- [ ] If button A was pressed, we want to point to player A. To do this, add an `if` block after your `while` loop, and replace `test` with `button A is pressed`.



- [ ] You can then use the `show leds` block to show an arrow pointing to player A.



- [ ] You should also do the same for button B.



Challenge: Keep score

Can you use two variables called `playerA` and `playerB` to keep track of each player's score?
You'll need to set both scores to 0 at the start of the game by placing code inside the 'on start' block.

And add 1 to whichever player wins each round.
You'll also need to think of a way to display the score.