

## 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.

**Instructions:** If you're reading this online, wait for an image to display on the micro:bit below and then press **A** or **B** first to see who is the fastest.

## Step 1: Wait for it!

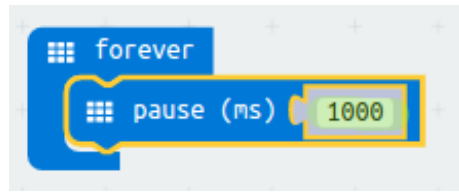
Let's start by displaying an image after a random amount of time.

### ✔ Activity Checklist

- Go to [jump.to/cc/pxt-new](https://jump.to/cc/pxt-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:



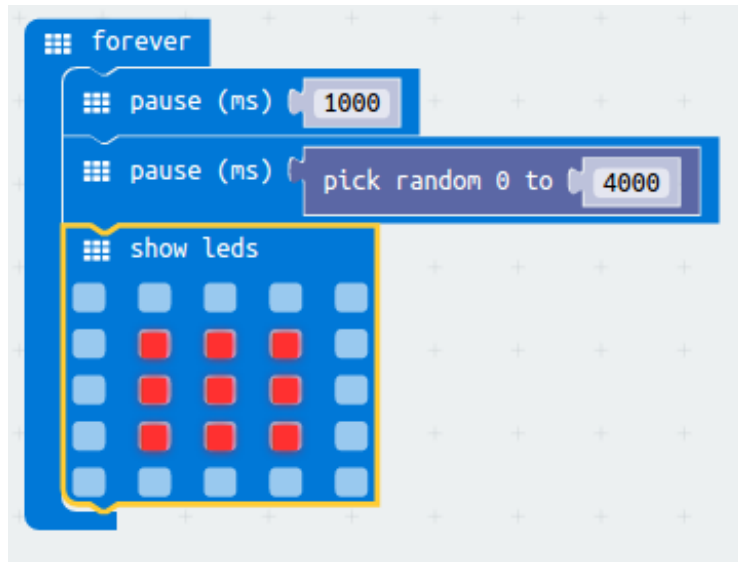
- Add another `pause` block and then drag a `pick random` block to `pause` block and set its value to 4000:



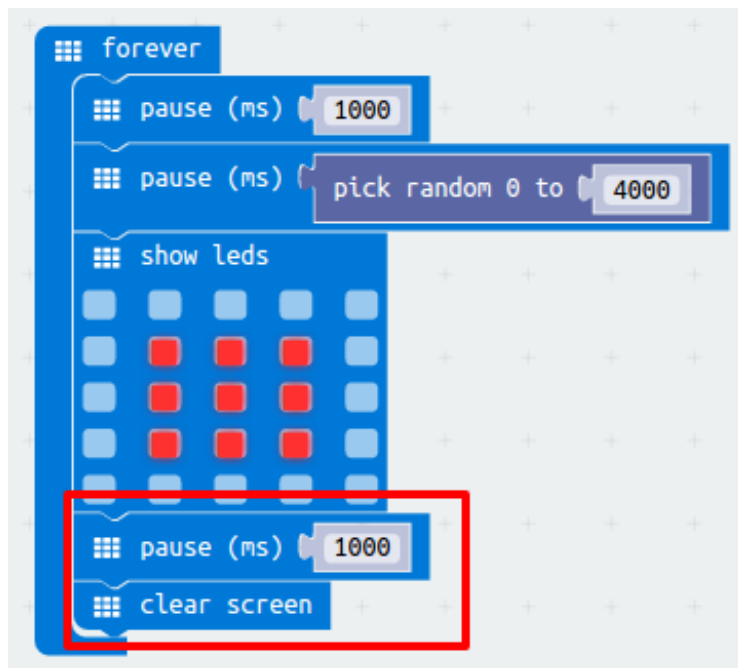
Remember that 1000ms is 1 second, so there will be a pause of at least 1 second up to a maximum of 5 seconds (1000 + 4000 ms).

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

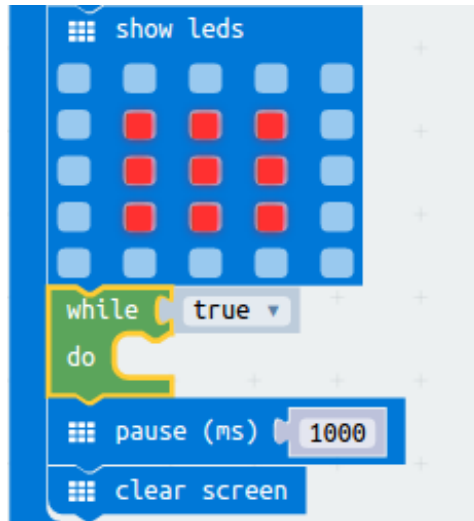
Let's add code to wait until a button is pressed.

### ✔ Activity Checklist

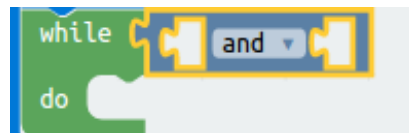
- After displaying an image, you'll need to wait until someone presses their button.

Another way of saying this is that you'll need to wait as long as button **A** and button **B** have **not** been pressed.

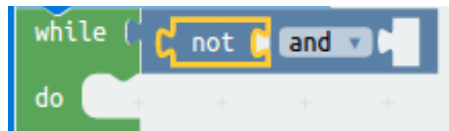
To do this, add a `while` loop from the 'Control' section. The `while` loop should be added in just after the `draw` block.



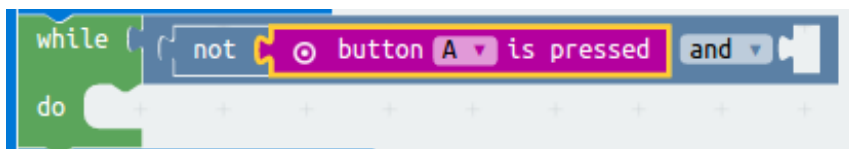
- Drag an `and` block from 'Logic' to your `while` block:



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



- Drag an `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.

```
while (not (button A is pressed) and (not (button B is pressed)))
do
```

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

```
while (not (button A is pressed) and (not (button B is pressed)))
do
  pause (ms) 20
```

- 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`.

```
while (not (button A is pressed) and (not (button B is pressed)))
do
  pause (ms) 20
  if (button A is pressed)
  then
    pause (ms) 1000
    clear screen
```

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

```

while (not (button A is pressed) and not (button B is pressed))
do
  pause (ms) 20
  if (button A is pressed)
  then
    show leds
    [5x5 grid of LEDs with red lights in a pattern]
  end if
  pause (ms) 1000
  clear screen
end while

```

You should also do the same for button B.

```

if (button A is pressed)
then
  show leds
  [5x5 grid of LEDs with red lights in a pattern]
end if

if (button B is pressed)
then
  show leds
  [5x5 grid of LEDs with red lights in a pattern]
end if

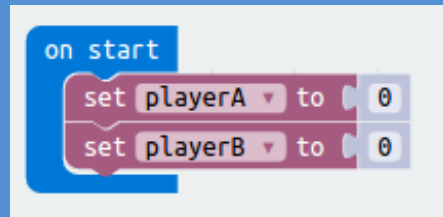
pause (ms) 1000
clear screen

```

## 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.