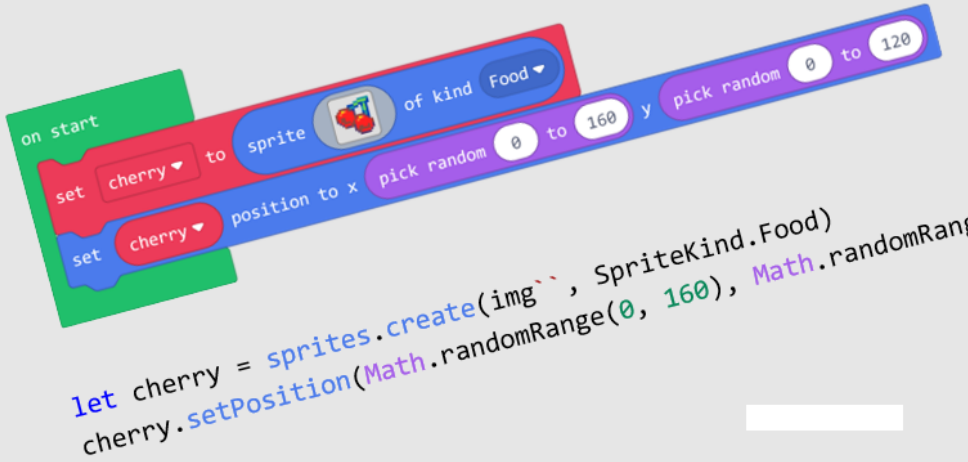
Microsoft



Microsoft MakeCode

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< Title >

How to create an Arcade Game

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Physical Computing with micro:bit

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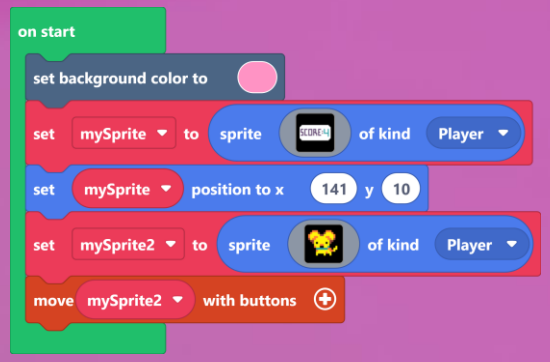
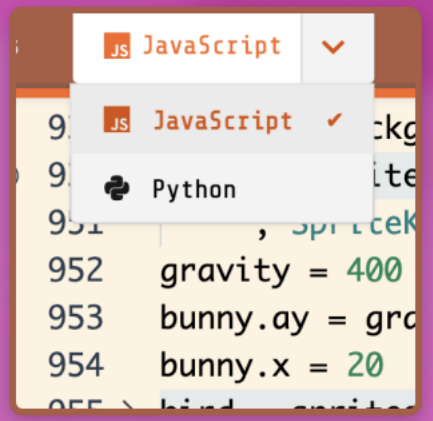
Retro Arcade Games

Blocks



Text



What is an Arcade game?

History of Arcade Games

An arcade game is a coin-operated video game machine installed in a public place like a restaurant, or an amusement park. Arcade games rose to popularity in the 1970's and 1980's.

The two paddles return the ball back and forth. The score is kept by the numbers (0 and 1) at the top of the screen.

The first successful Arcade game was called Pong, created by Atari in 1972.

Examples of Arcade Games?

Pac-Man

Space Invaders

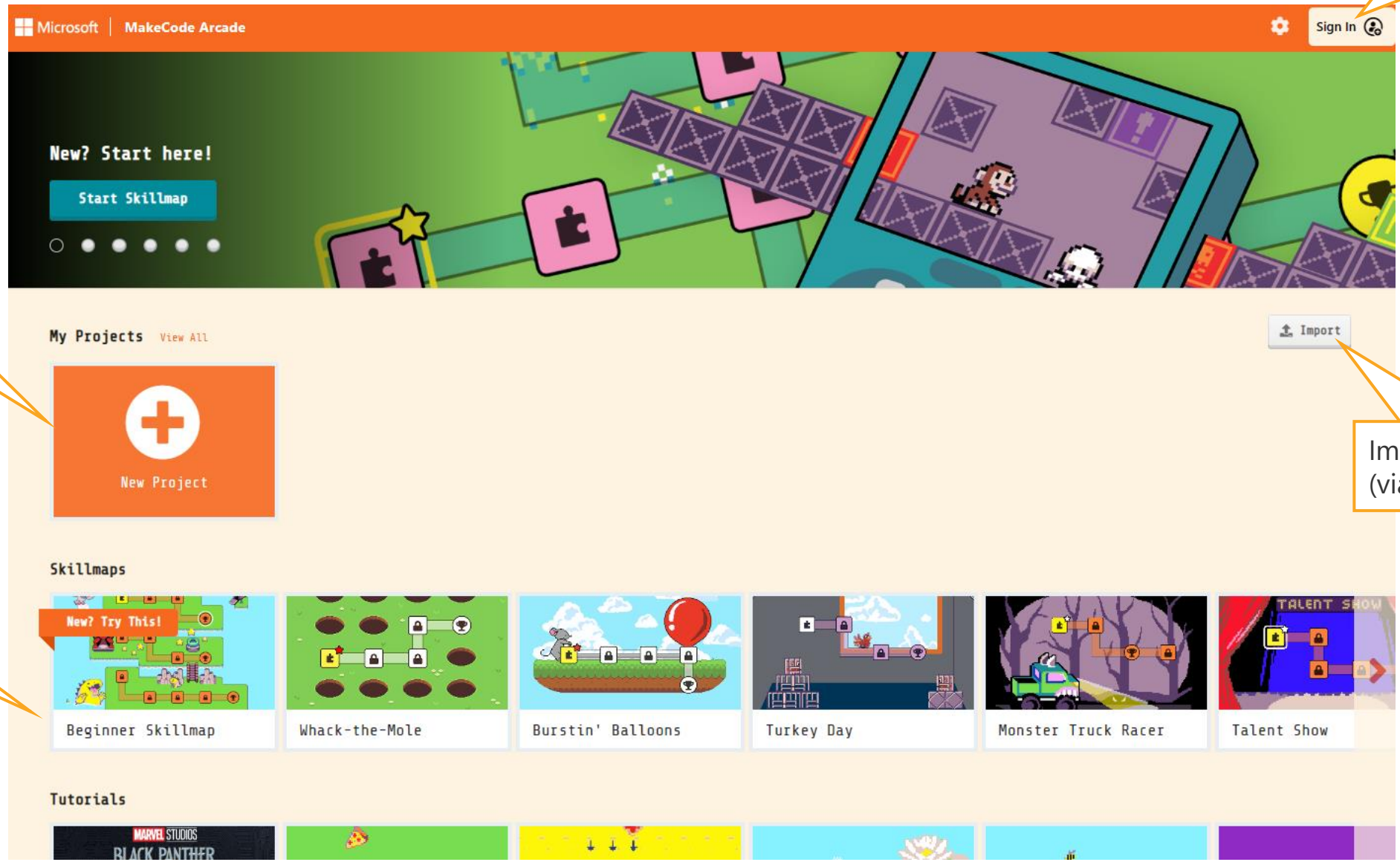
Donkey Kong

Let’s code a game!

Platformer

Open Browser: **arcade.makecode.com**

Optionally sign in to save to projects cloud



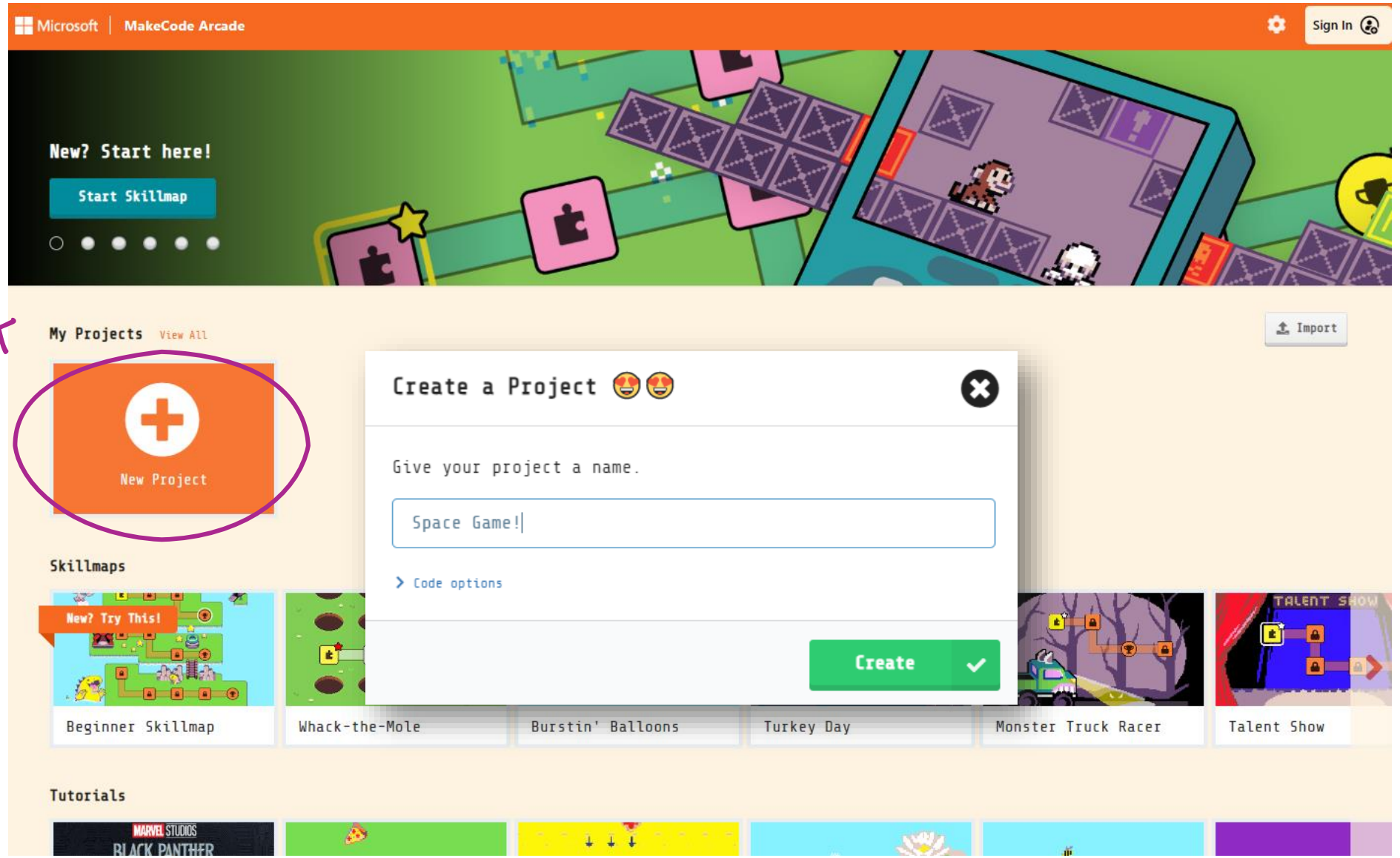
Create a New blank Project

Import Projects (via a File, or URL)

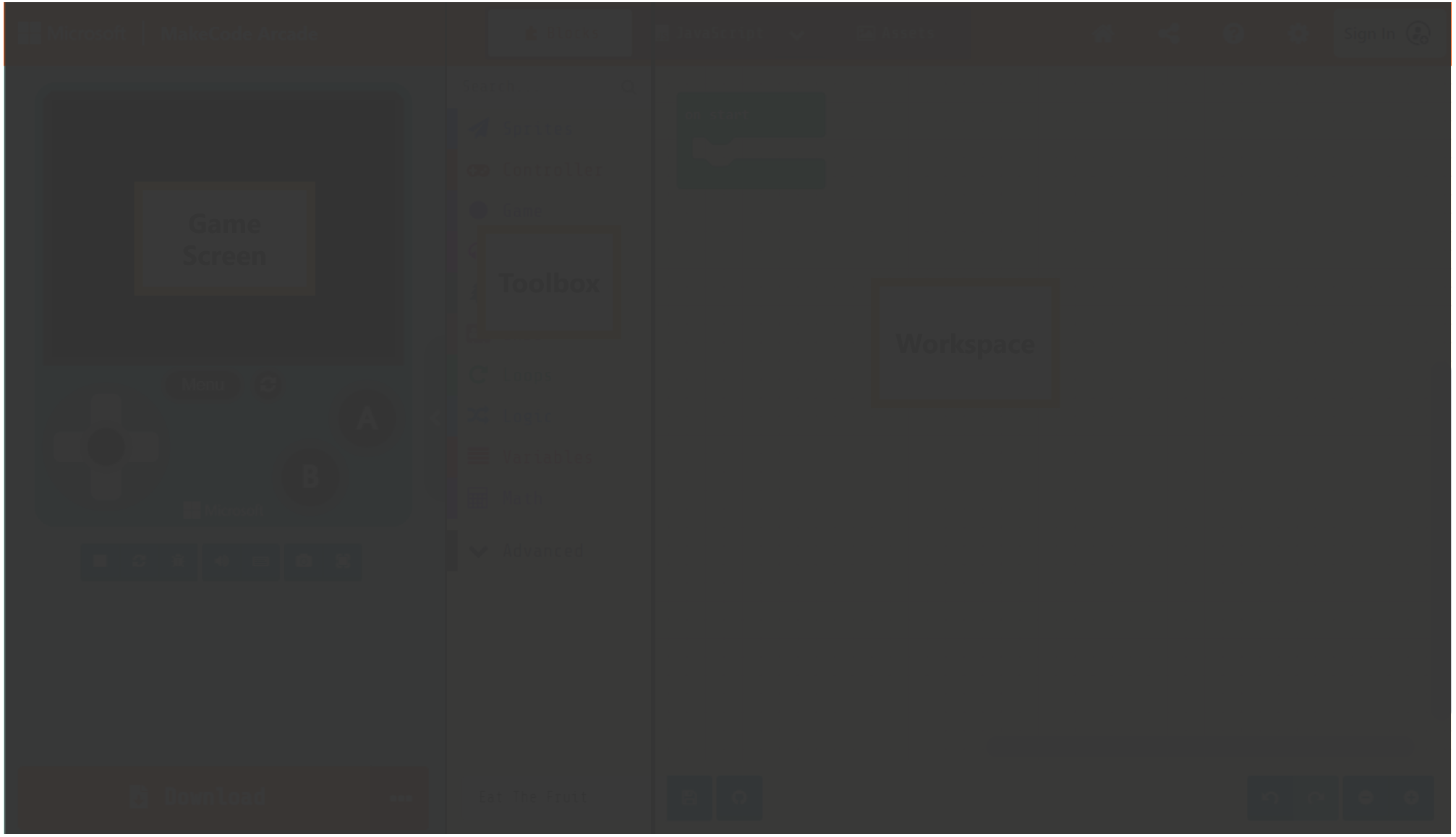
Step-by-step Skillmaps and Tutorials

Create a New Project

Click on New Project



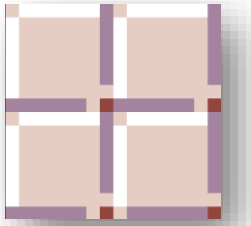
Getting familiar with MakeCode Arcade



Tiles and Tilemaps

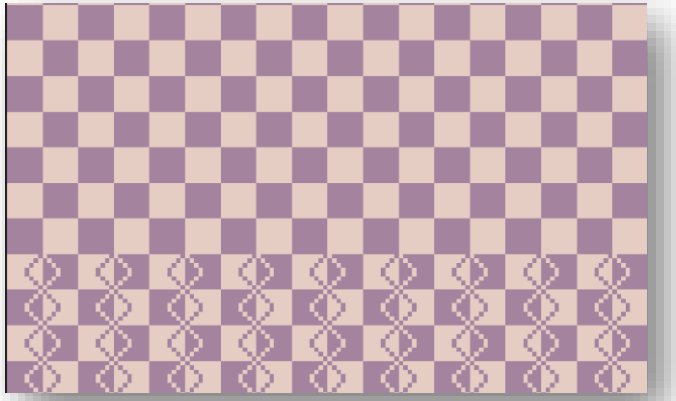
- What is a Tile?

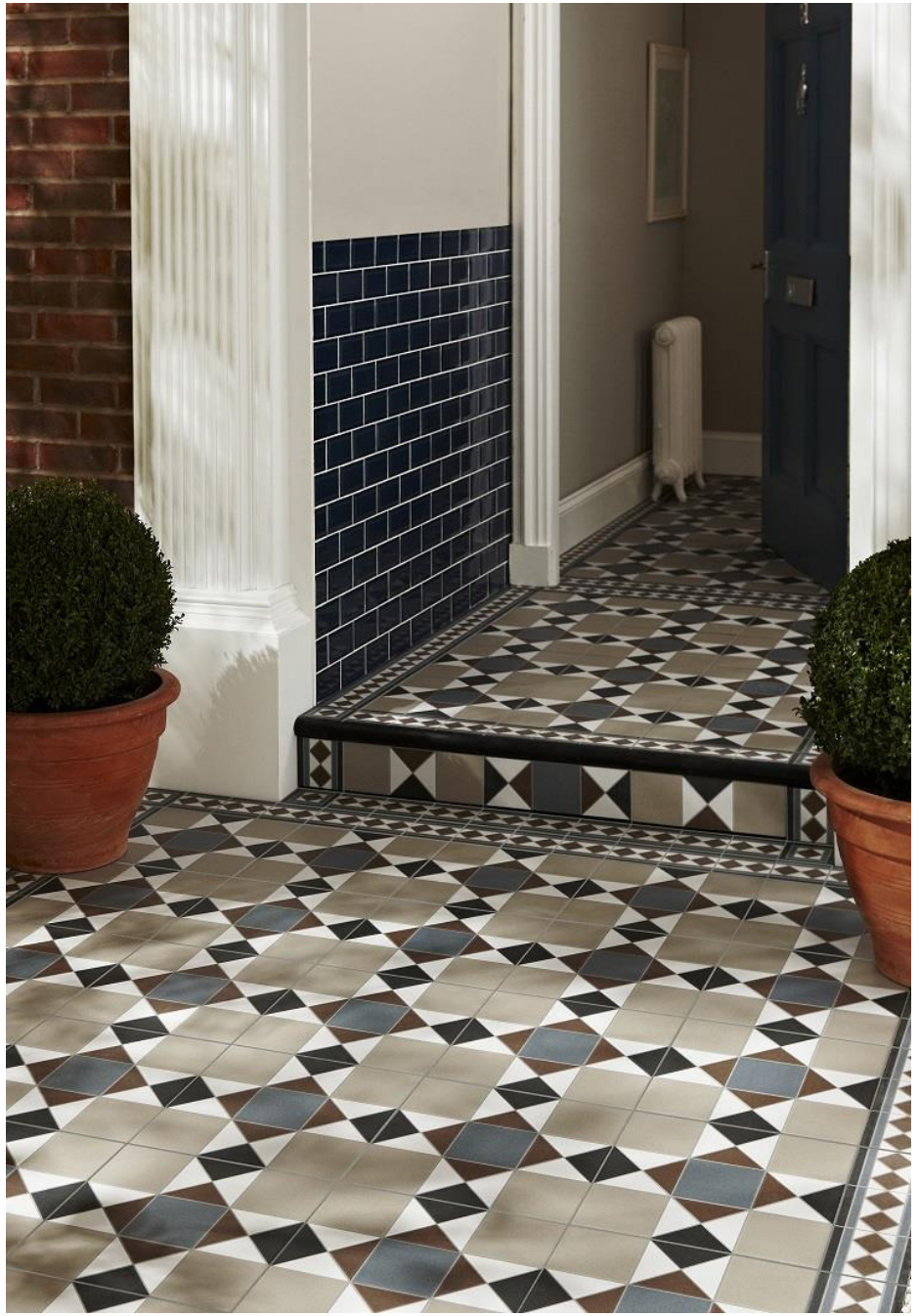
A square pattern



- What is a Tilemap?

A collection of tiles

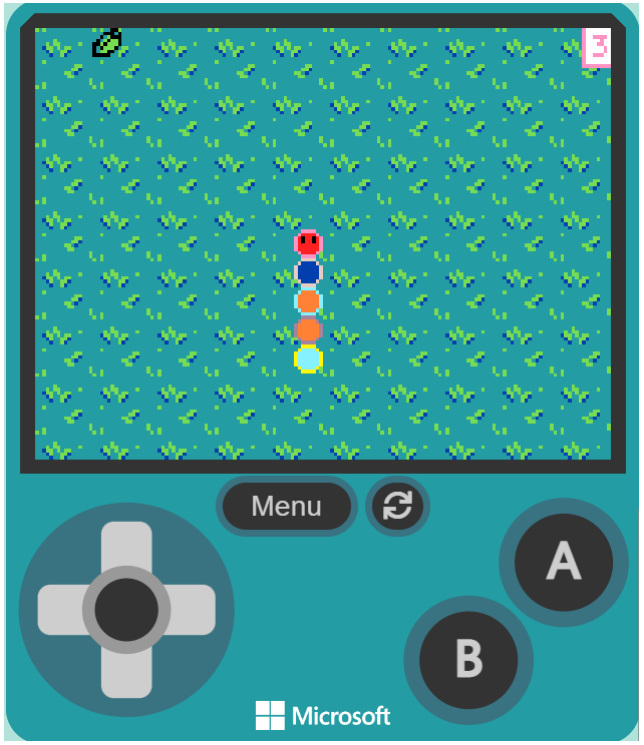


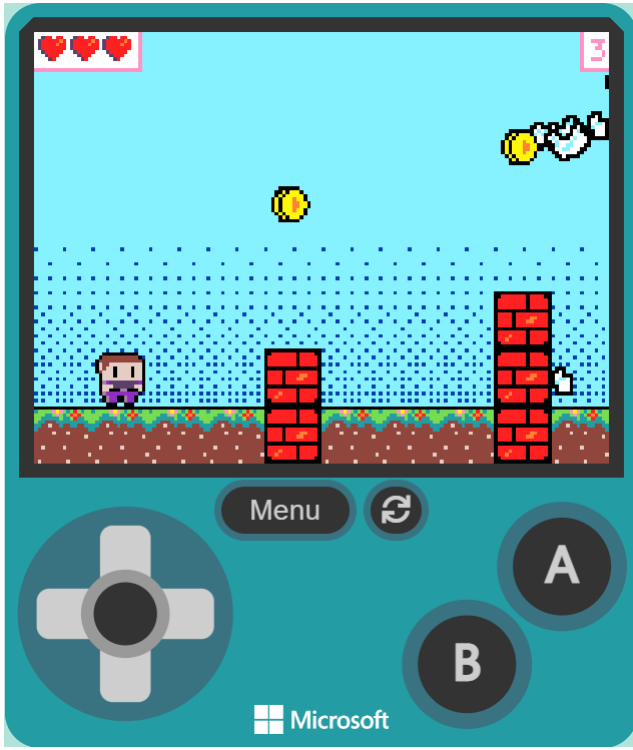


Tilemap Games

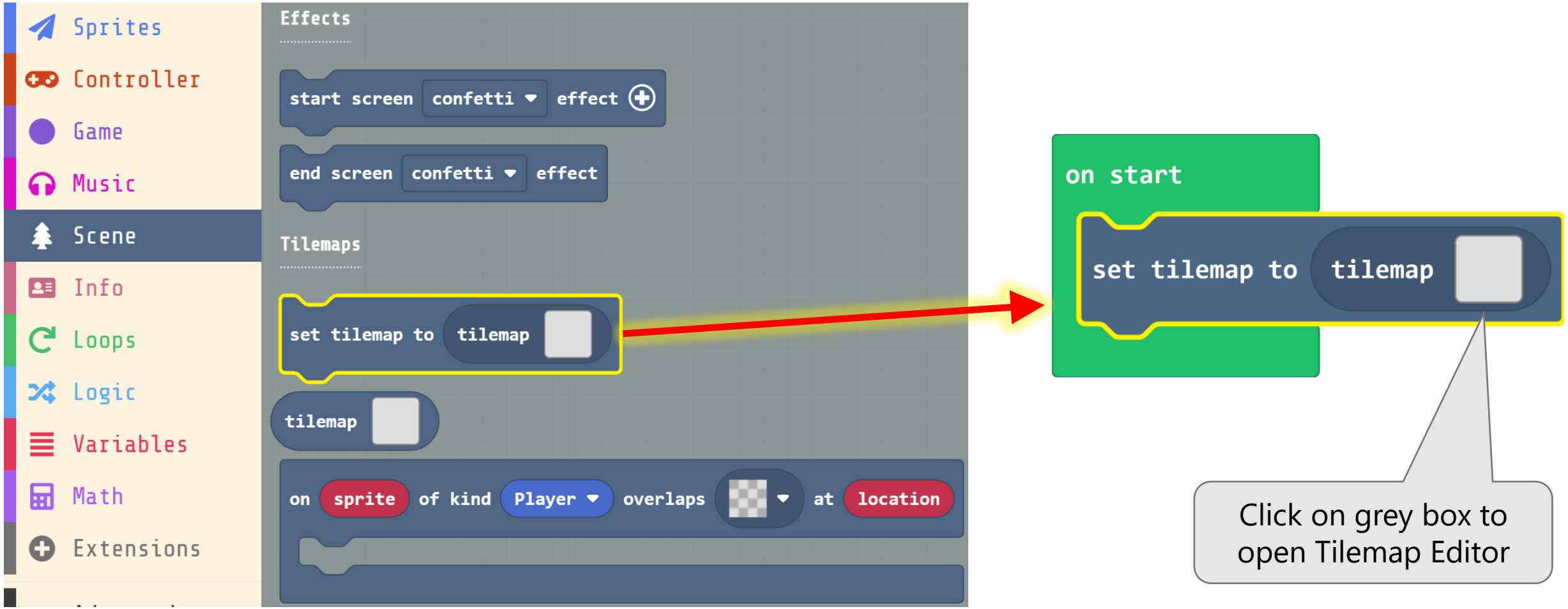
Tilemaps are good for top-down perspective (maze, adventure)

or side-view perspective games (platformer, side-scroller)





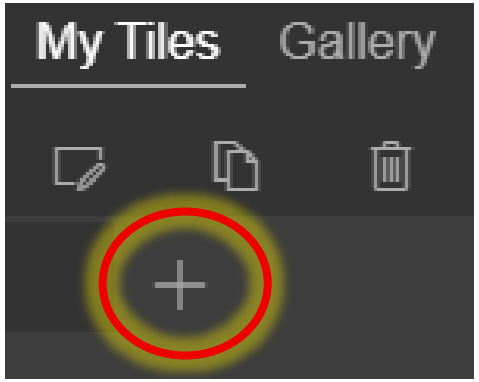
Create the Tile Map

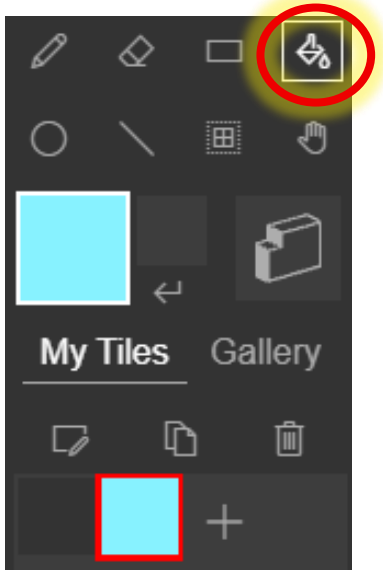


Set the Canvas

- In the lower left corner, set the Tilemap size to **50** x **8** pixels

- Click on **My Tiles**, and Click on **+** to draw your tile to serve as the background (sky?)



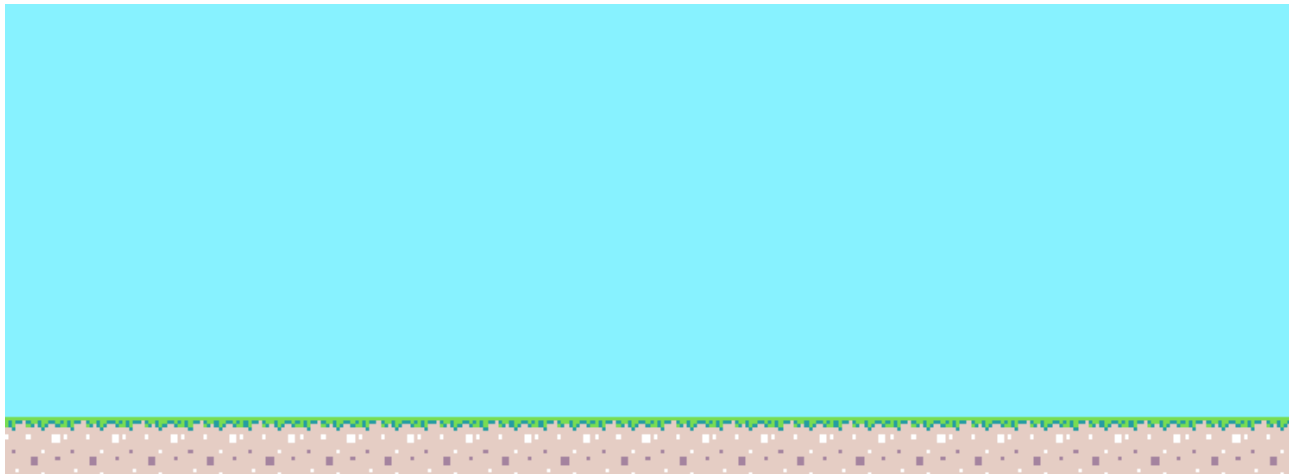


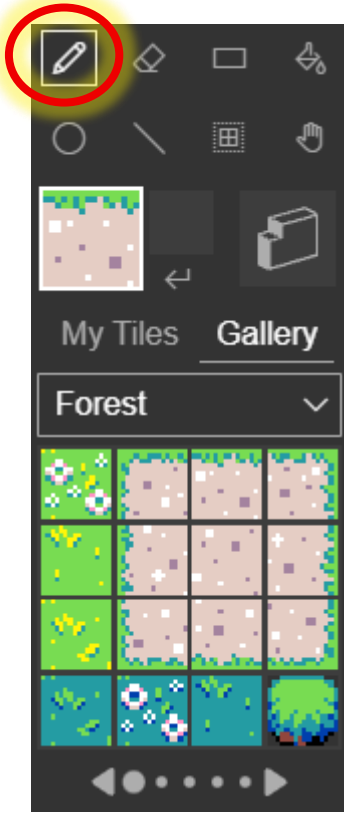
- Use the **Fill** tool to paint your whole Tilemap

Draw the ground

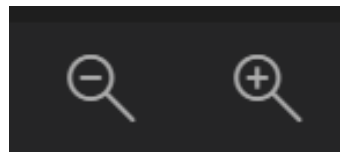
- From the **Gallery**, pick a tile to use as the ground (or draw your own in My Tiles)

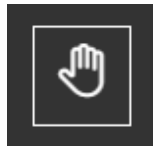
- Paint the tile along the bottom of your Tilemap





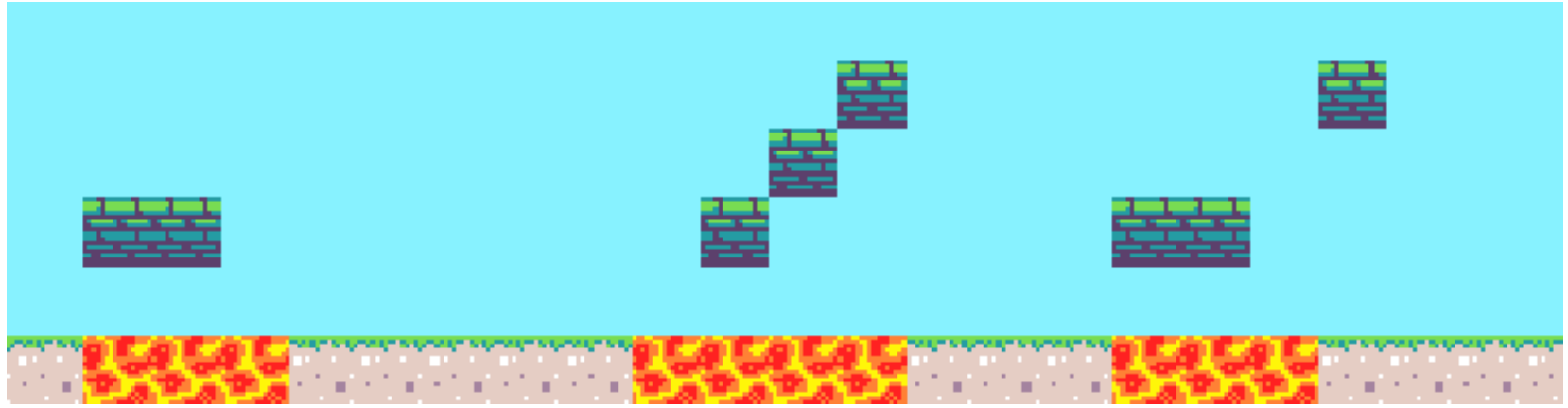
Note – you can use the **Zoom** buttons in the bottom right corner to zoom out to see your whole tilemap, and the **Pan** tool to move your tilemap around





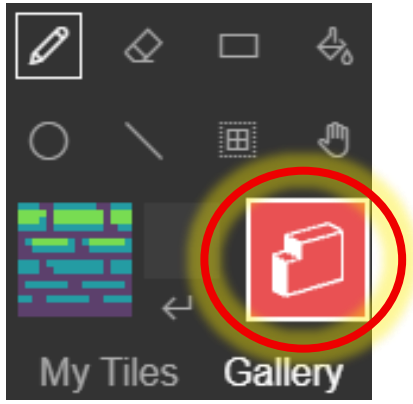
Draw pits and platforms

- From the Gallery, pick a tile to use as the pits (or draw your own in My Tiles)
- Paint the pits in places along the ground
- From the Gallery, pick a tile to use as the platforms (or draw your own in My Tiles)
- Paint the platforms above pits where your player can jump up to

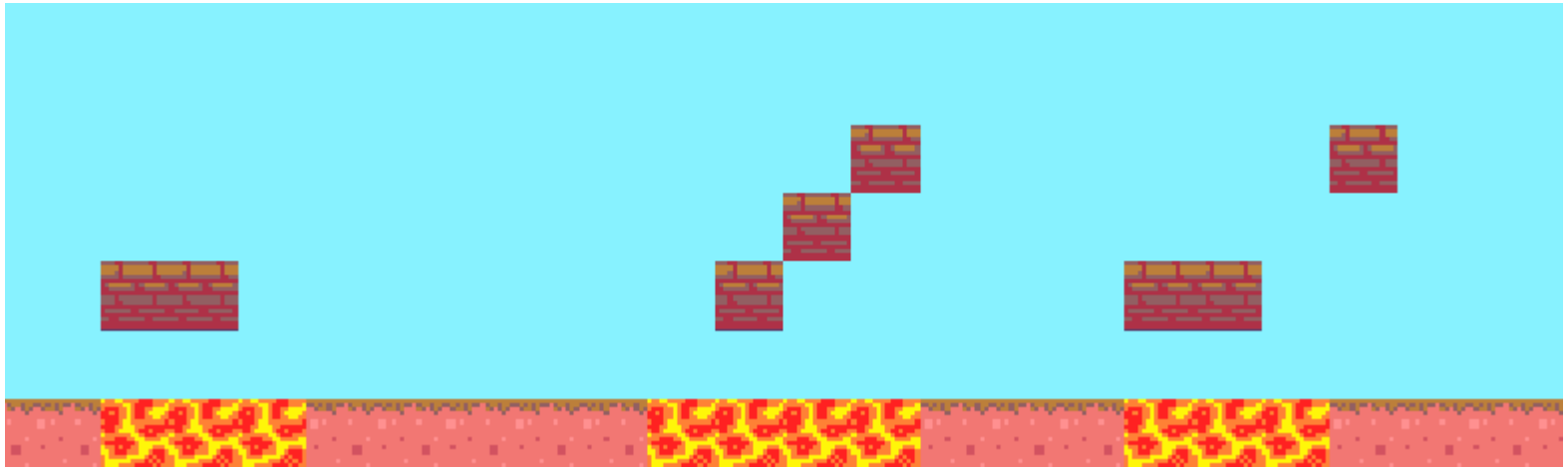


Add walls (tiles player can’t go through)

- Select the **Wall** Tool



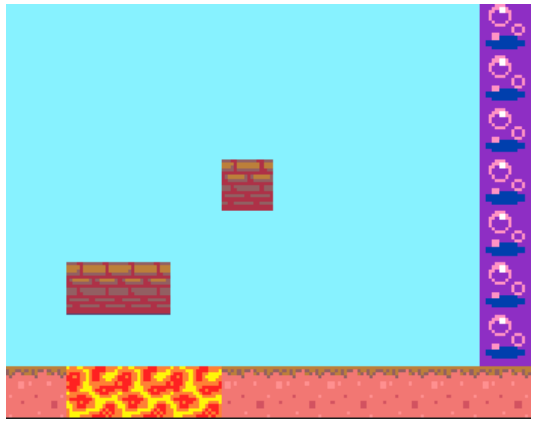
- Paint walls on the ground and the platform tiles



Add Finish Line

- From the Gallery, pick a tile to use as the ending point (or draw your own in My Tiles)

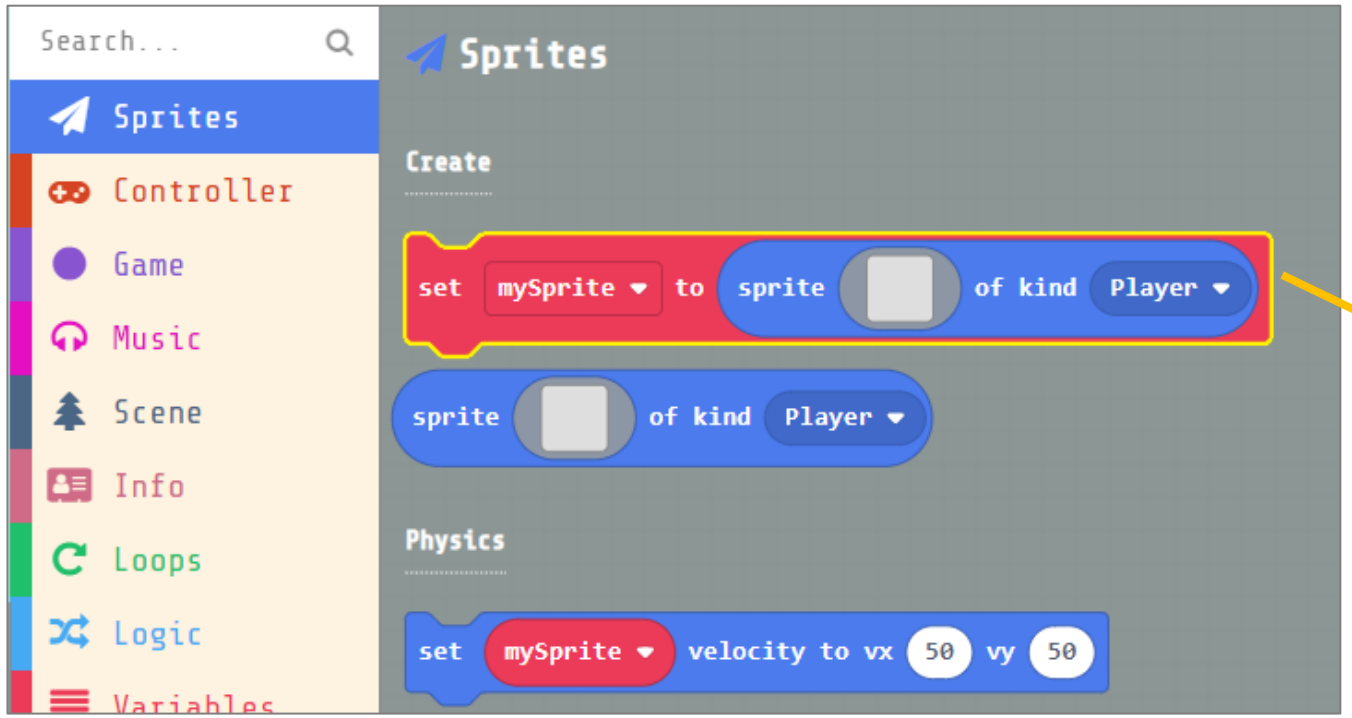
- Paint tile along the right-most edge of your Tilemap

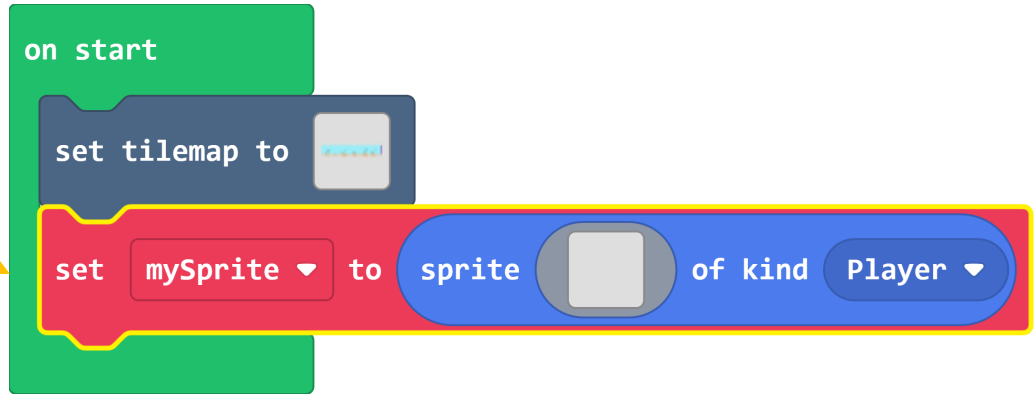


- Click **Done** to close Tilemap Editor

Create your Player Sprite

- From the **Sprites** Toolbox drawer, drag a **Set mySprite** block into the **On Start** block

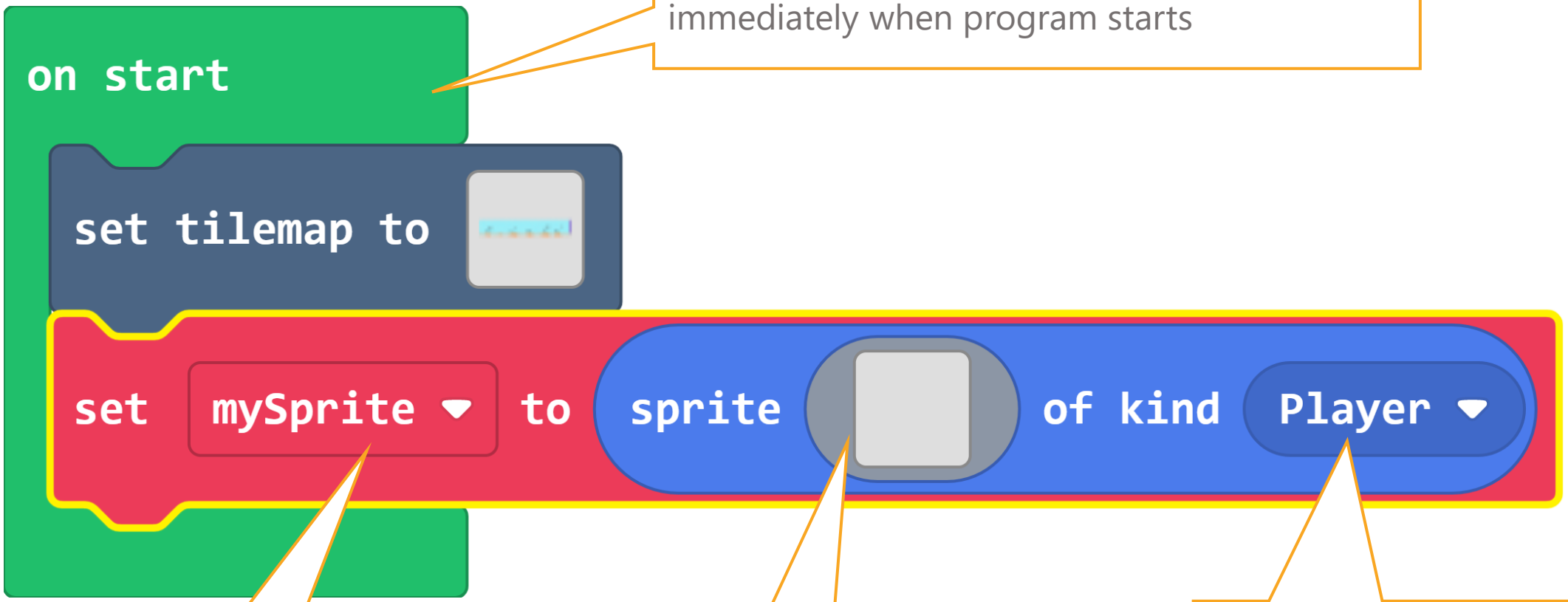




Sprites

any object in a game that has properties and behaviors

Set Sprite block



Whatever code is in the On Start block will run immediately when program starts

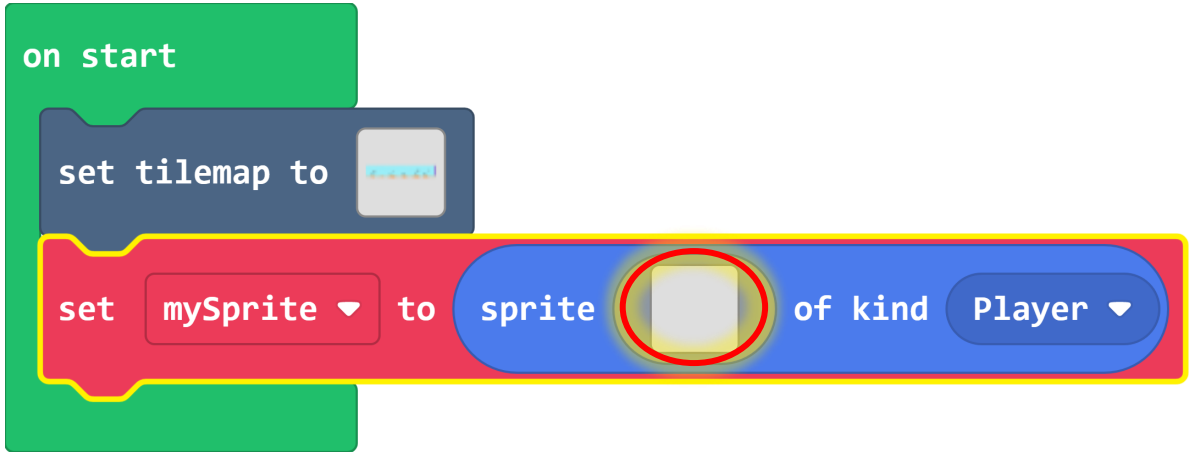
Sprite name

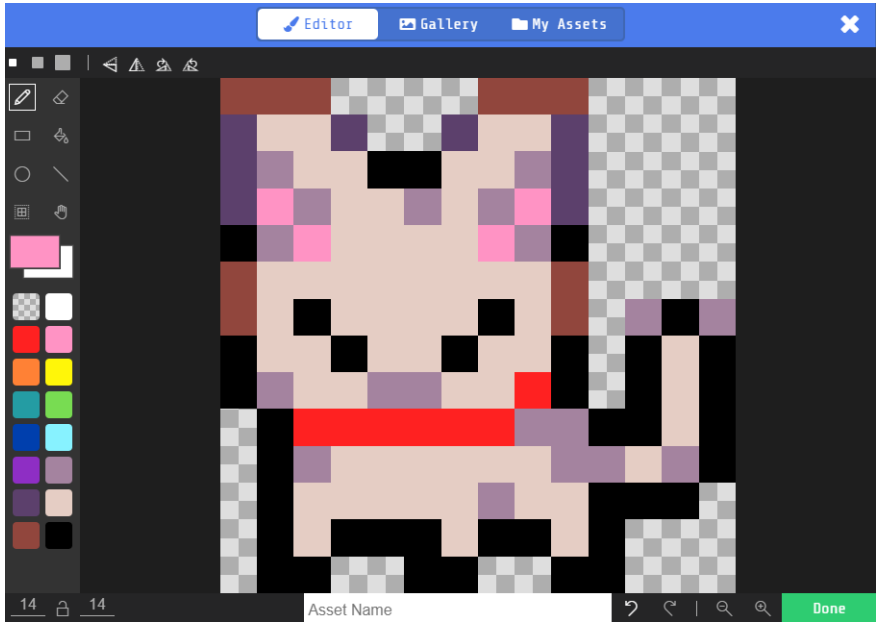
Sprite image

Sprite kind
(or the type of Sprite in your game)

Draw your character

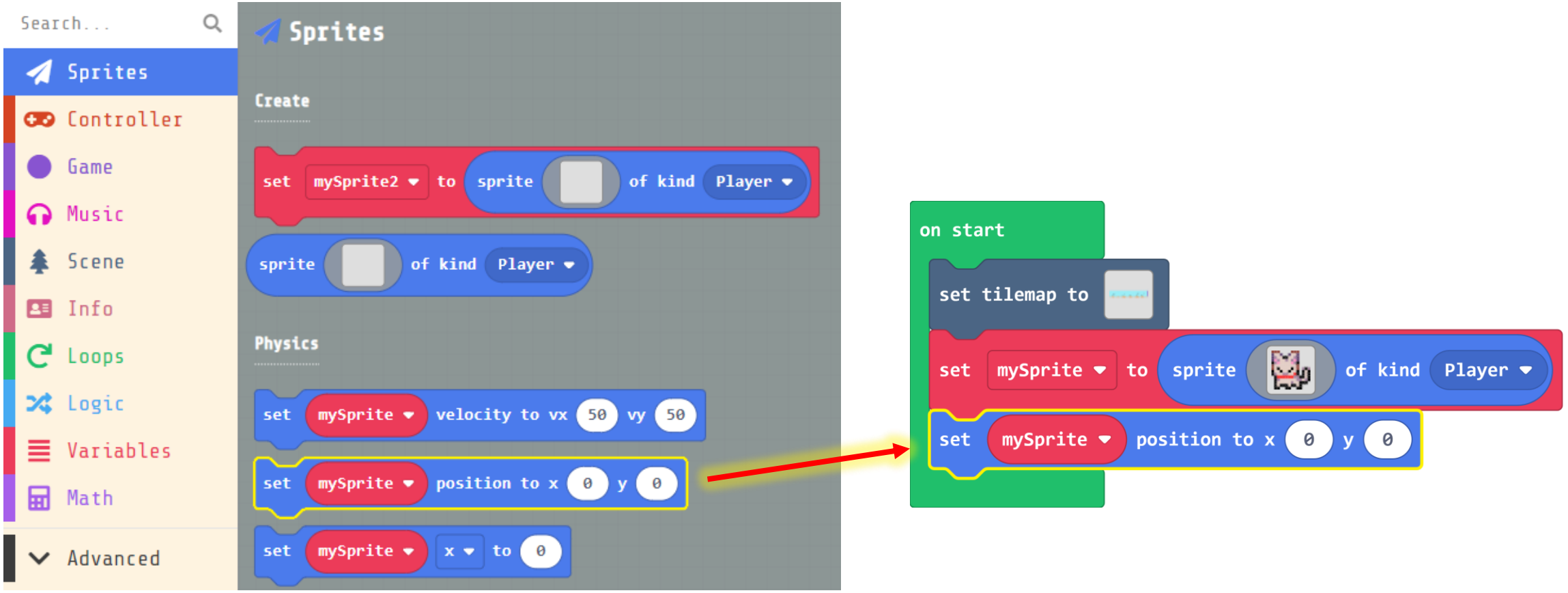
- In the **Set mySprite** block, click on the grey square to open the Image Editor
- Draw your Player Character
- Or pick an existing image from the Gallery





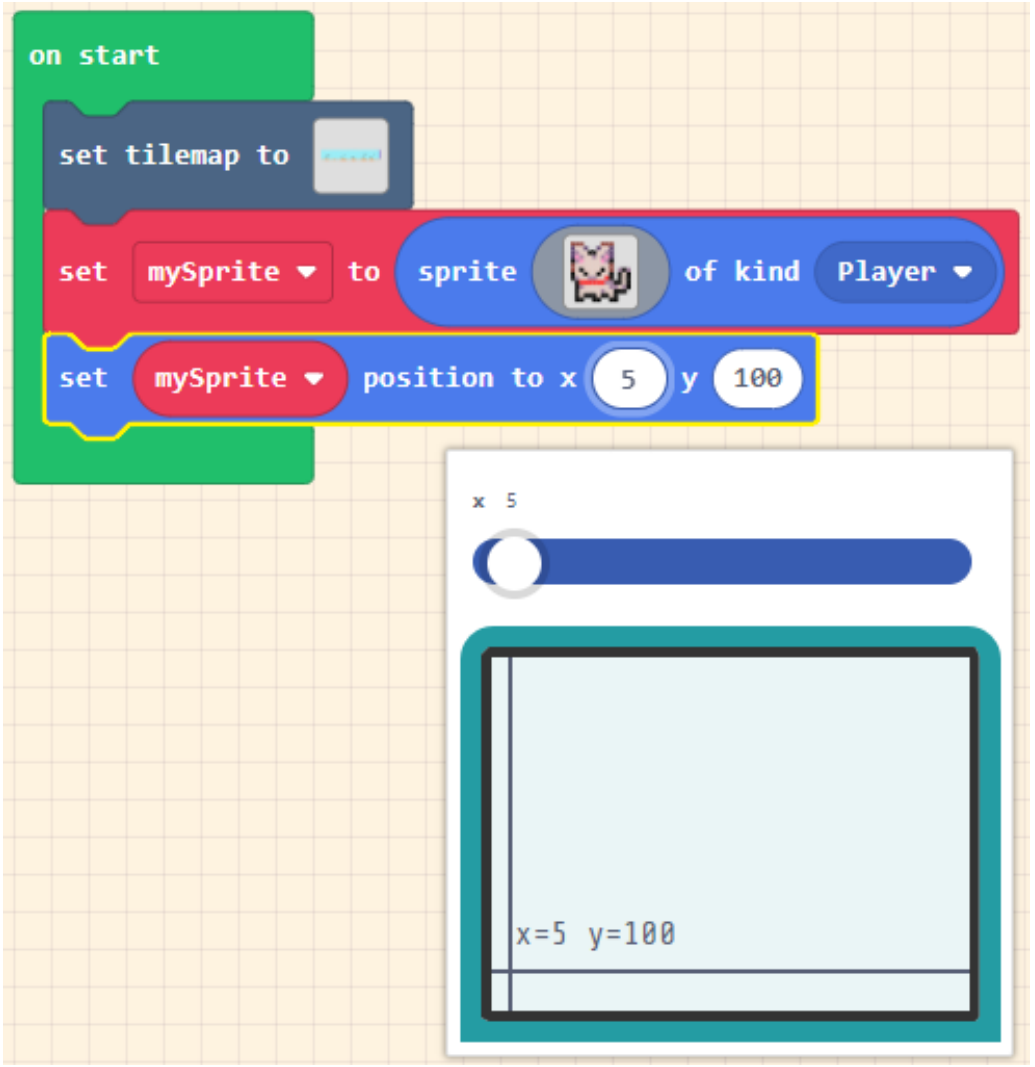
Set the starting position

- From the **Sprites** Toolbox drawer, drag a **Set mySprite Position** block into the **On Start** block



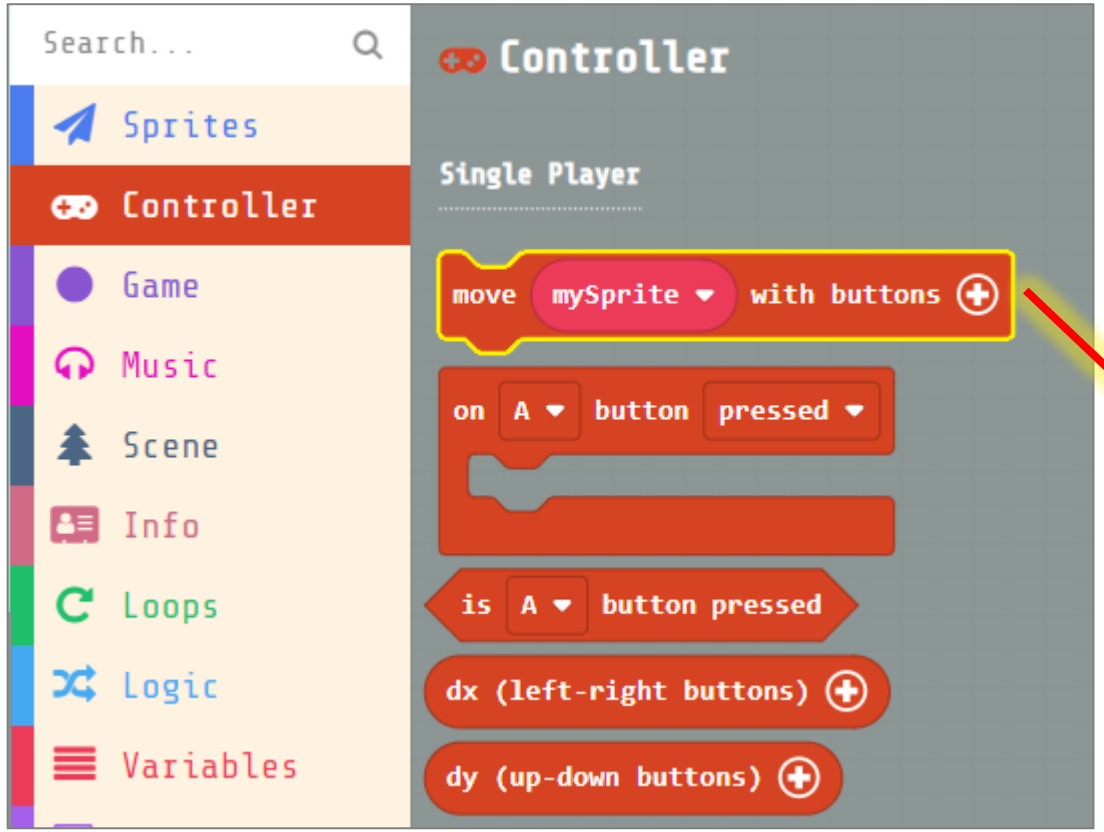
Set the starting position

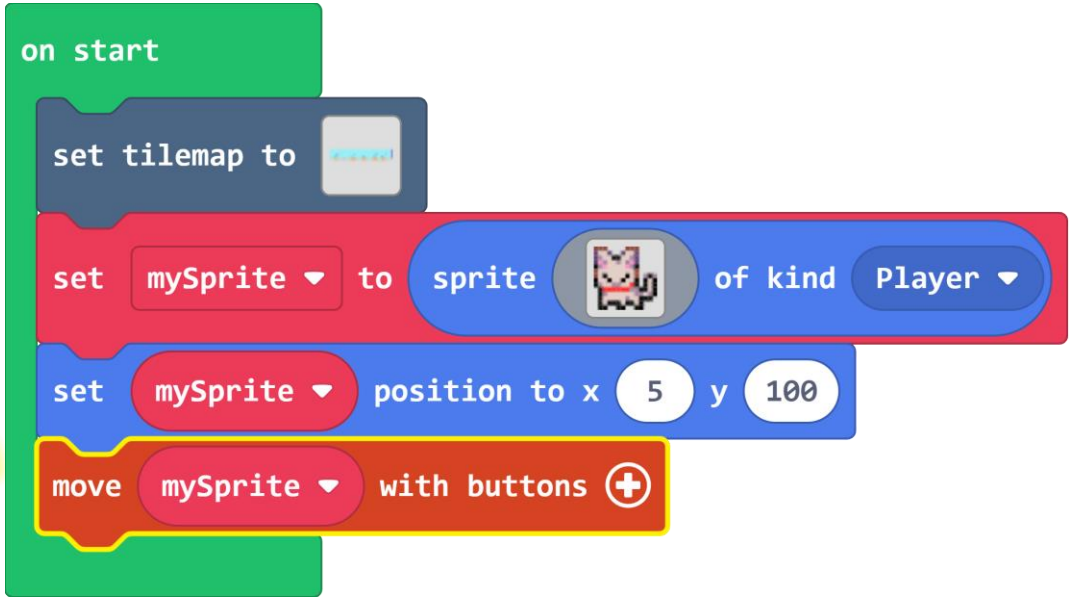
- In the **Set mySprite Position** block, click on the **x** value to open the coordinate picker
- Move your cursor to the bottom left of the screen and click to select the starting position for your sprite
- Check the location in the Game Window – your sprite should be starting on the left of your tilemap above the ground



Control the movement of your Sprite

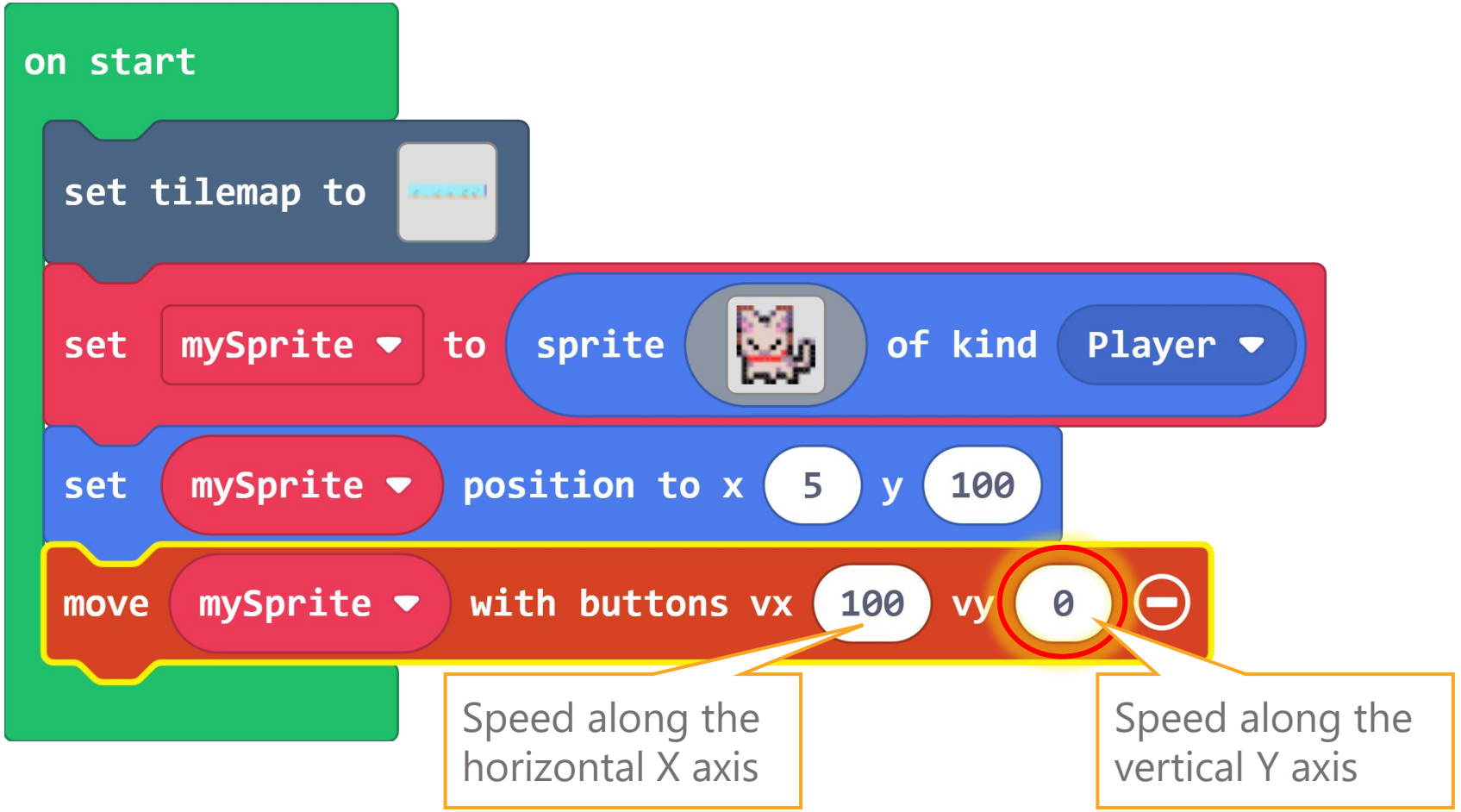
- From the **Controller** Toolbox drawer, drag a **Move mySprite** block into the **On Start** block





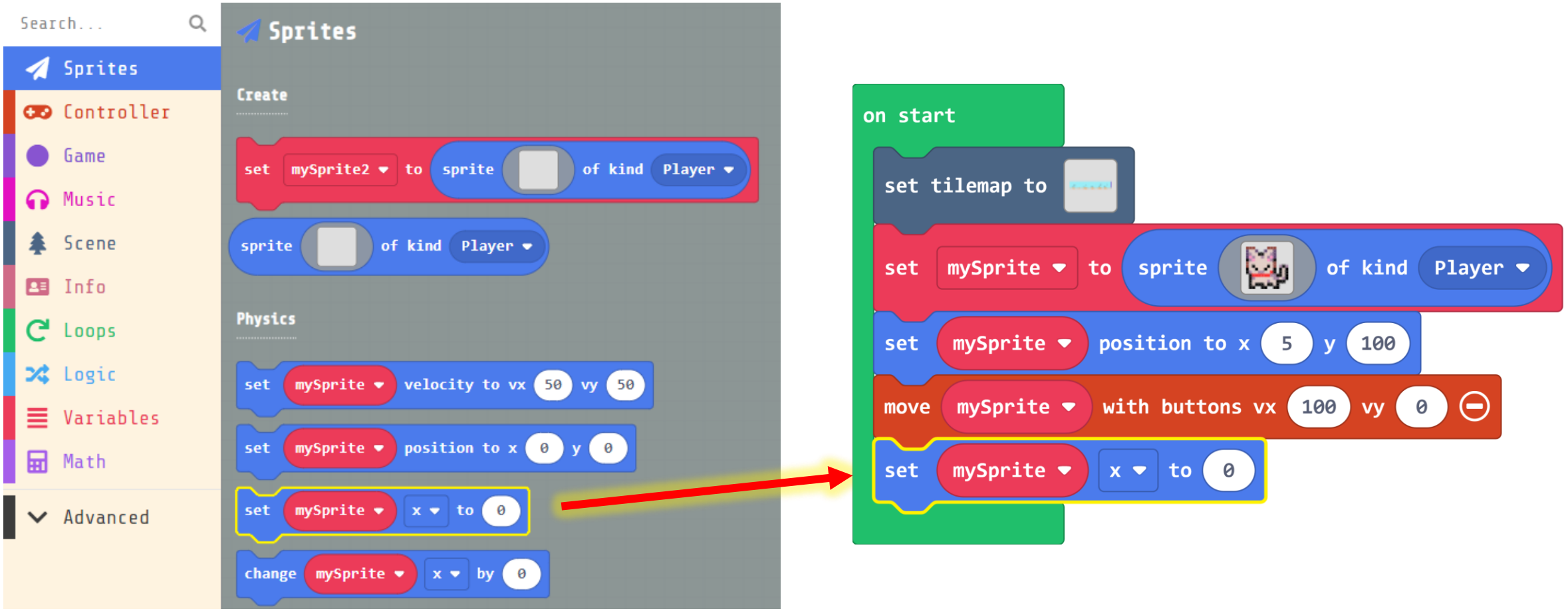
Move only left and right

- In the **Move mySprite** block, click the plus (+) icon to expand
- Set the Velocity **vy** value to **0**



Add Gravity

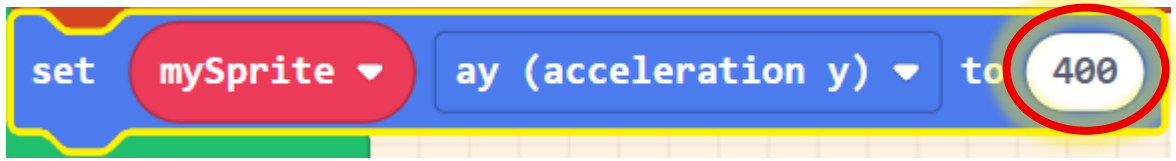
- From the **Sprites** Toolbox drawer, drag a **Set mySprite** property block into the **On Start** block

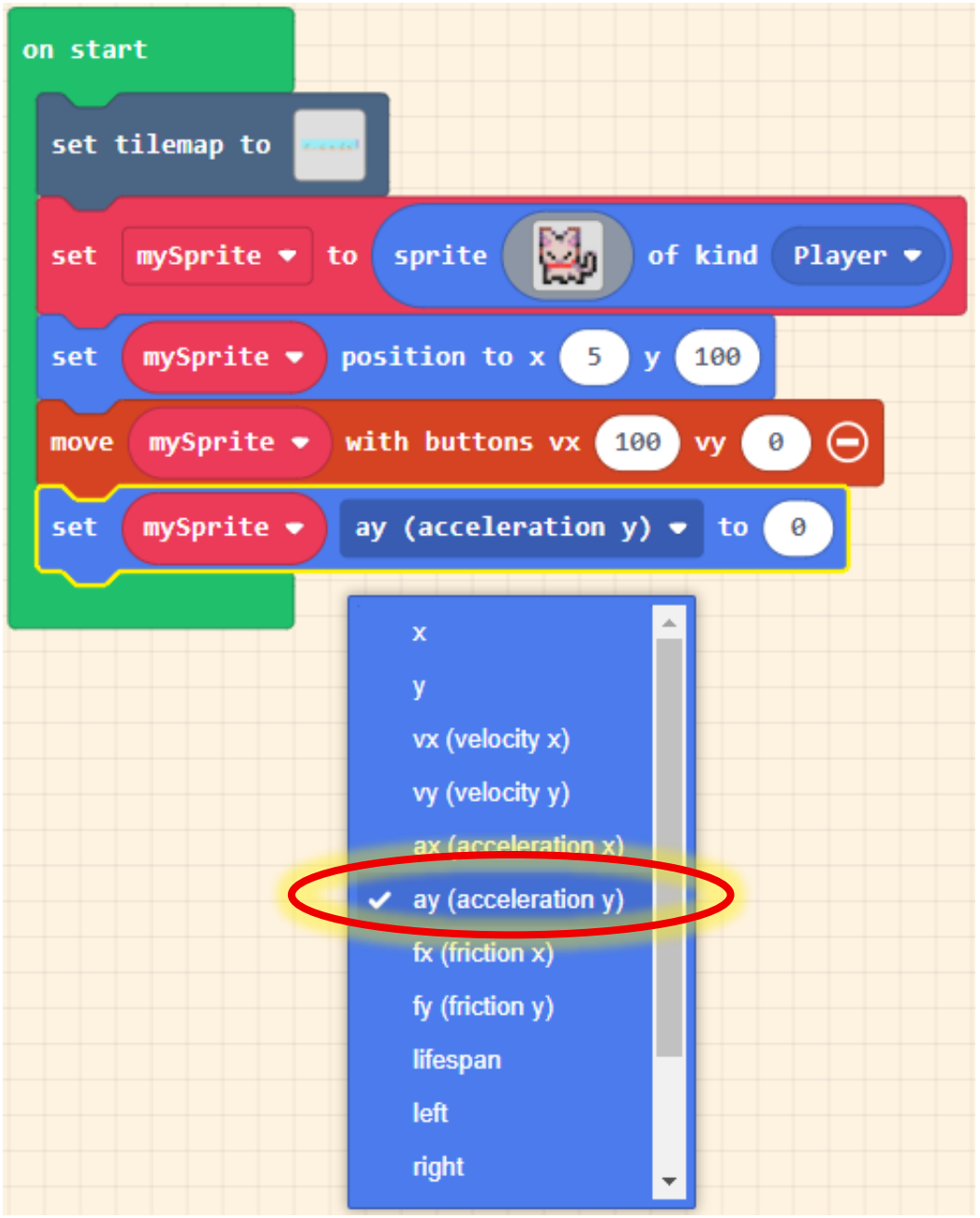


Add Gravity

- In the **Set mySprite** property block, click on the **x** drop-down menu and select **ay** acceleration along the y axis (in the vertical direction)

- Set the value to be **400**





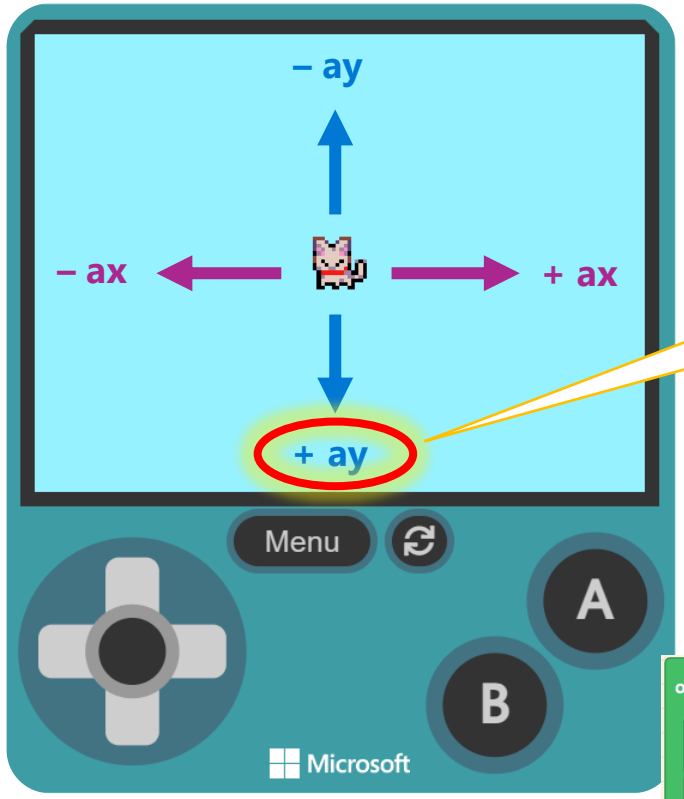
Acceleration = change in speed

ax = horizontal acceleration

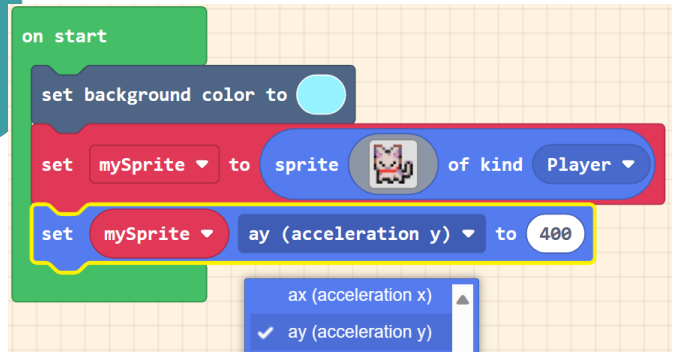
- positive value = left to right
- negative value = right to left

ay = vertical acceleration

- positive value = top to bottom
- negative value = bottom to top

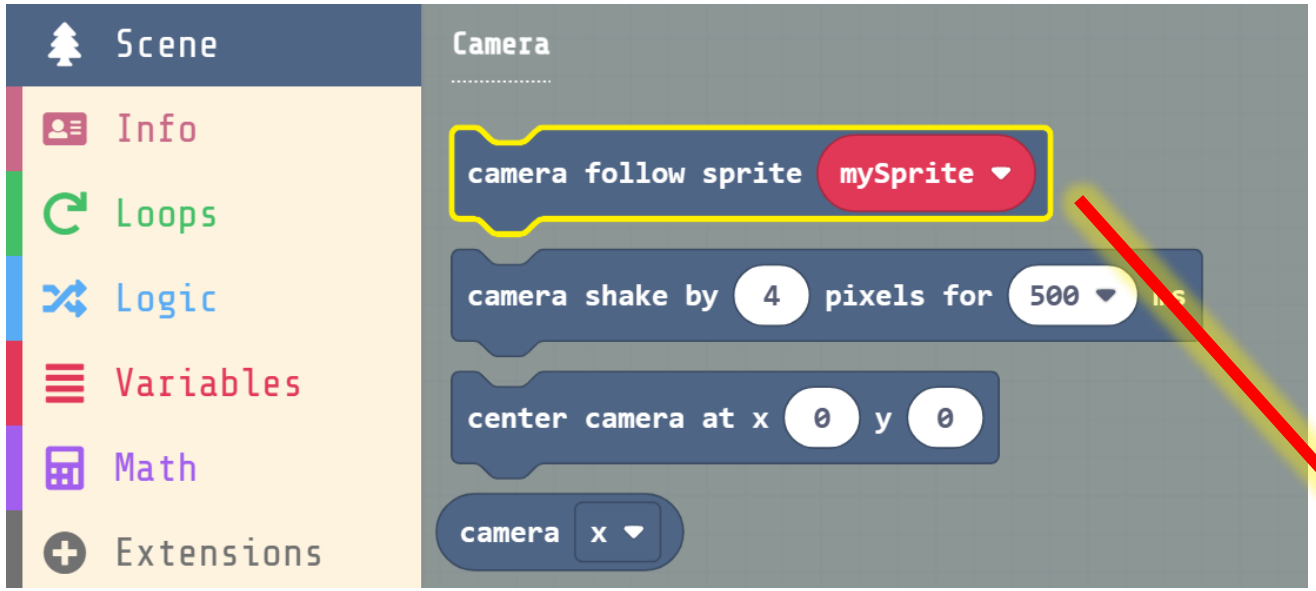


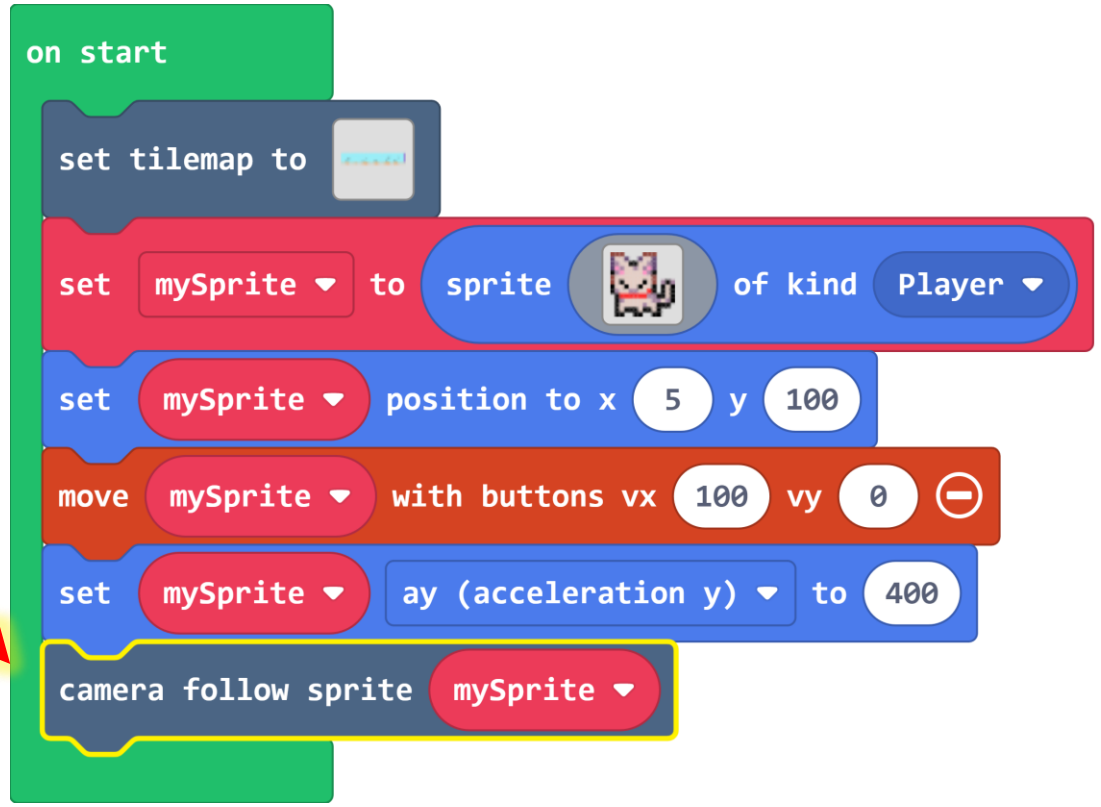
Positive **ay** value simulates gravity pulling sprite down



The value for acceleration determines how quickly the speed of the sprite will change

Camera to follow Sprite

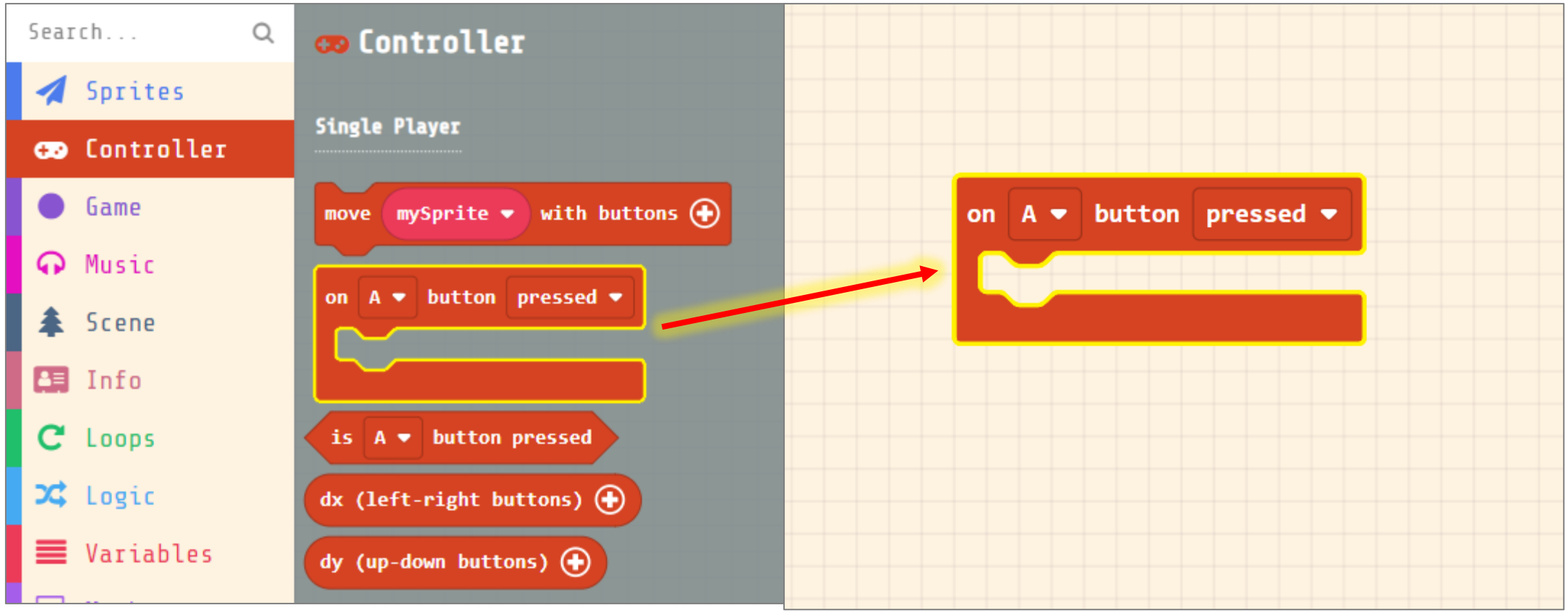




Test your game

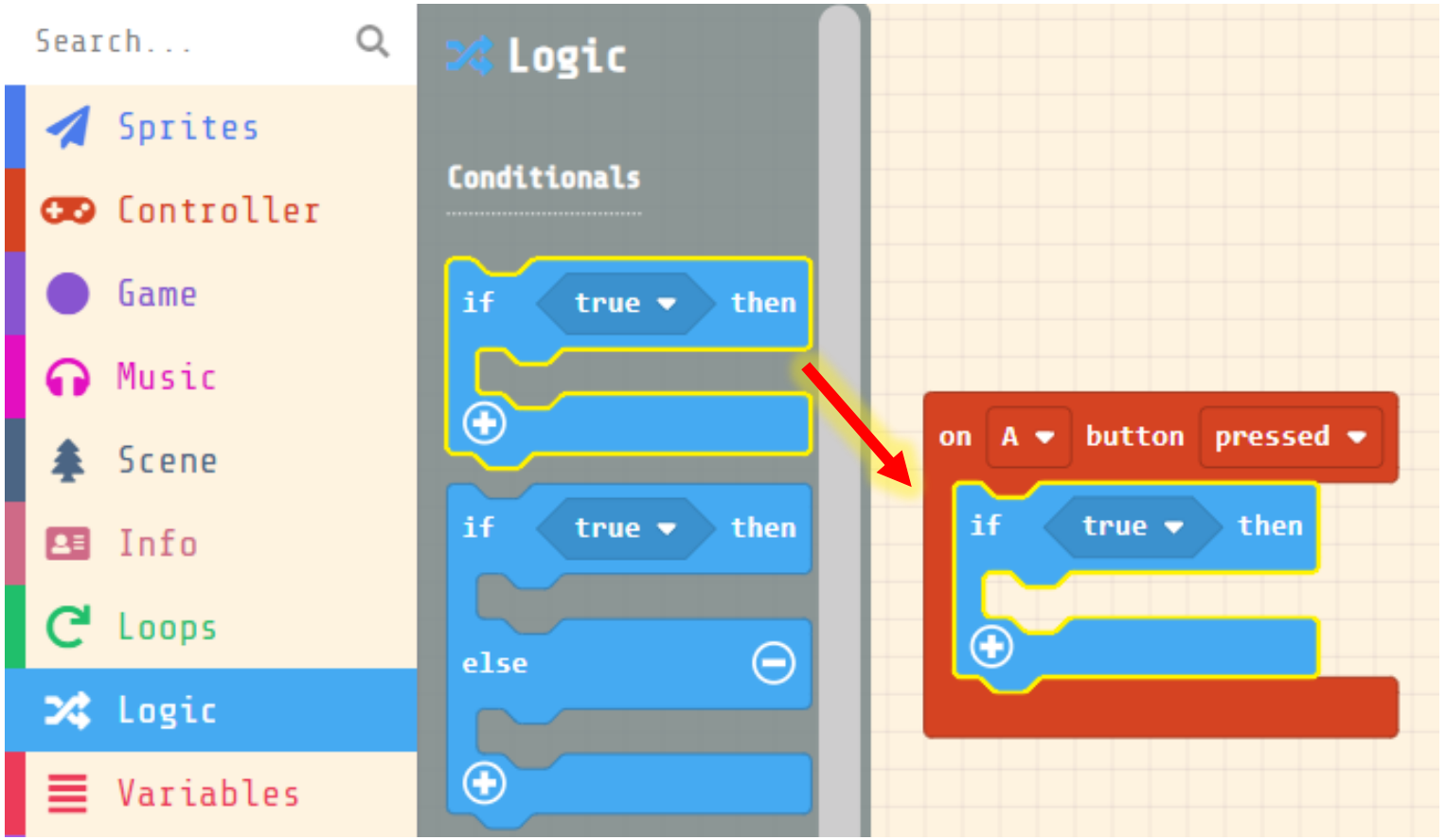
Add a Jump when you press A button

- From the **Controller** Toolbox drawer, drag an **On Button A Pressed** block onto the Workspace



Check to see if you're on the ground

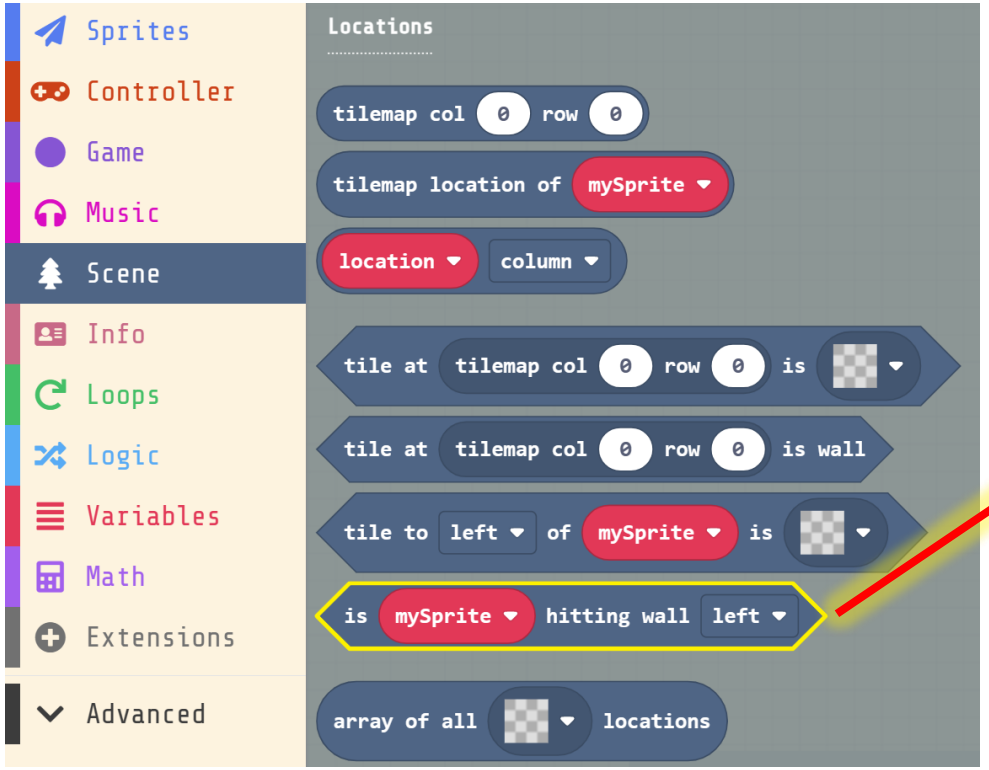
- From the **Logic** Toolbox drawer, drag an **If Then** block into the **On A Button Pressed** block

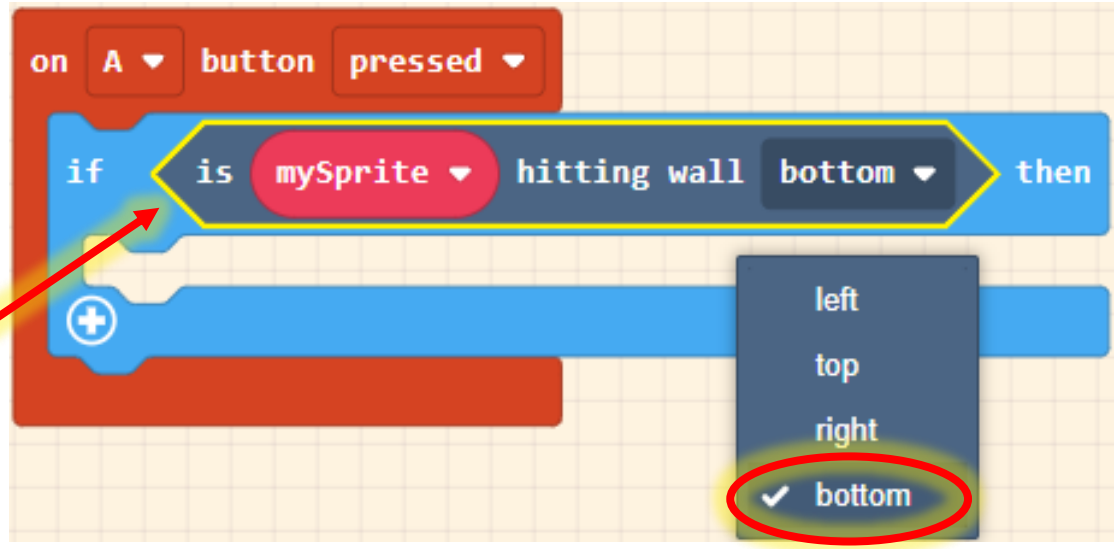


Note that it's too easy to jump multiple times in mid-air, so let's only allow our player to jump when they are touching the ground or a platform

Check to see if you're on the ground

- From the **Scene** Toolbox drawer, drag a **Is mySprite Hitting Wall** block into the **If Then** block, replacing **True**

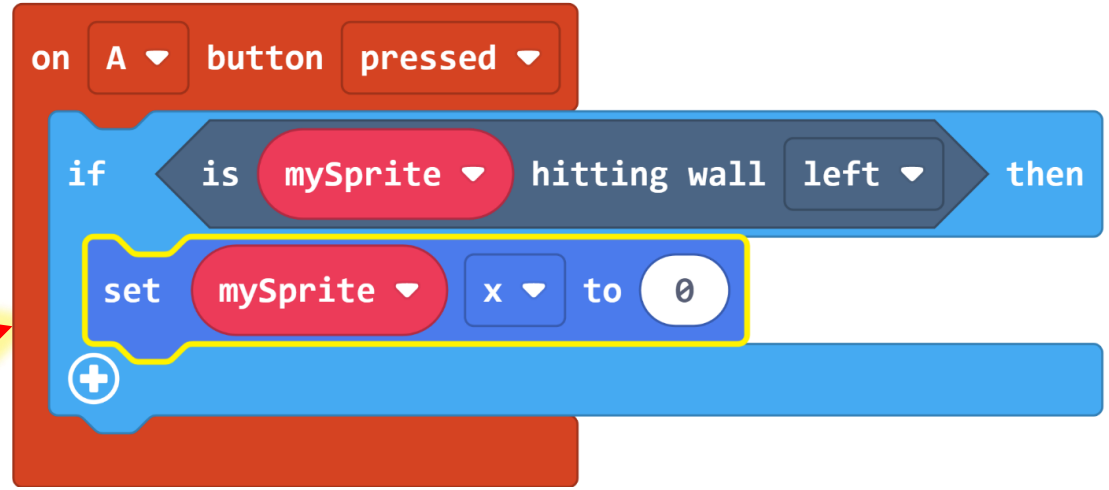




- In the **Is mySprite Hitting Wall** block, click on left drop-down menu and select **bottom**

Set jumping velocity!

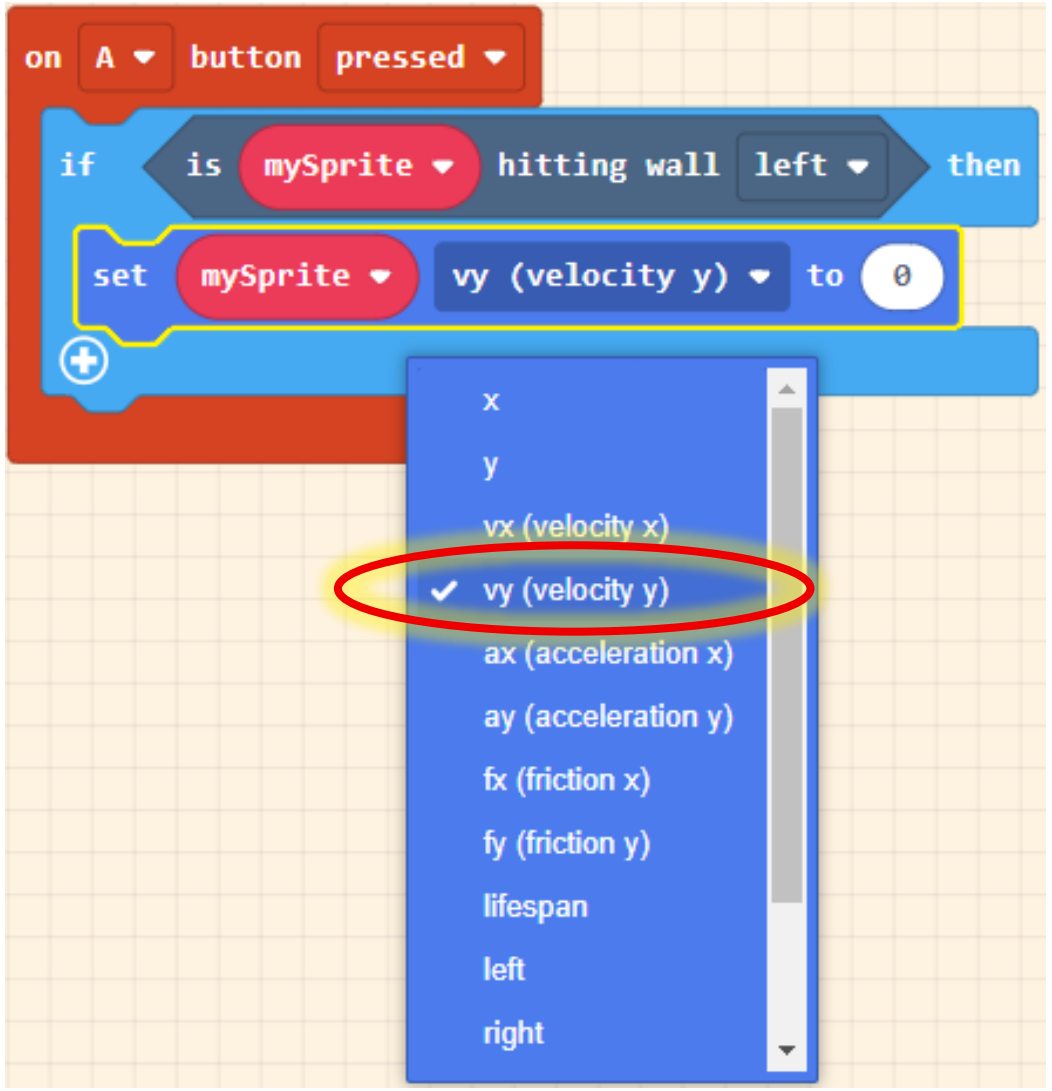
- From the **Sprites** Toolbox drawer, drag a **Set mySprite** property block into the **If Then** block



Set Velocity

- In the **Set mySprite** property block, click on the **x** drop-down menu and select **vy** – velocity along the y axis (in the vertical direction)

- Set the value to be **-200**



Velocity = speed and direction

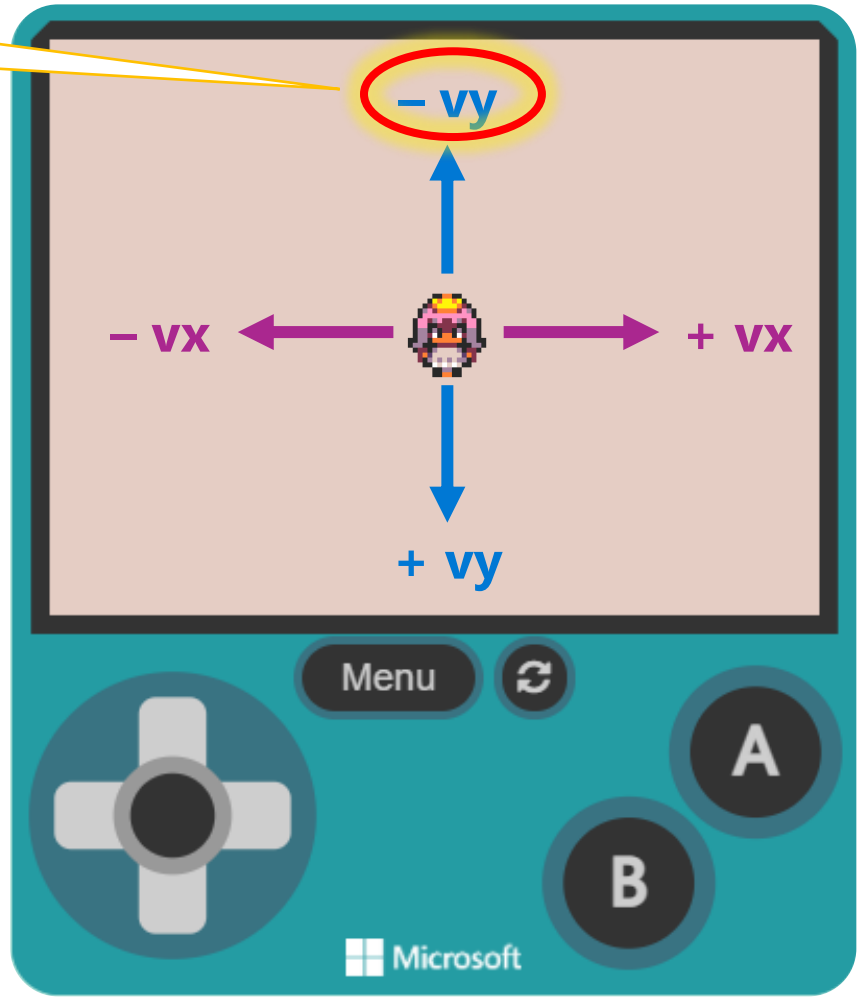
Our jumping velocity is a negative vy value, so our sprite will jump towards the top of the screen

vx = horizontal movement

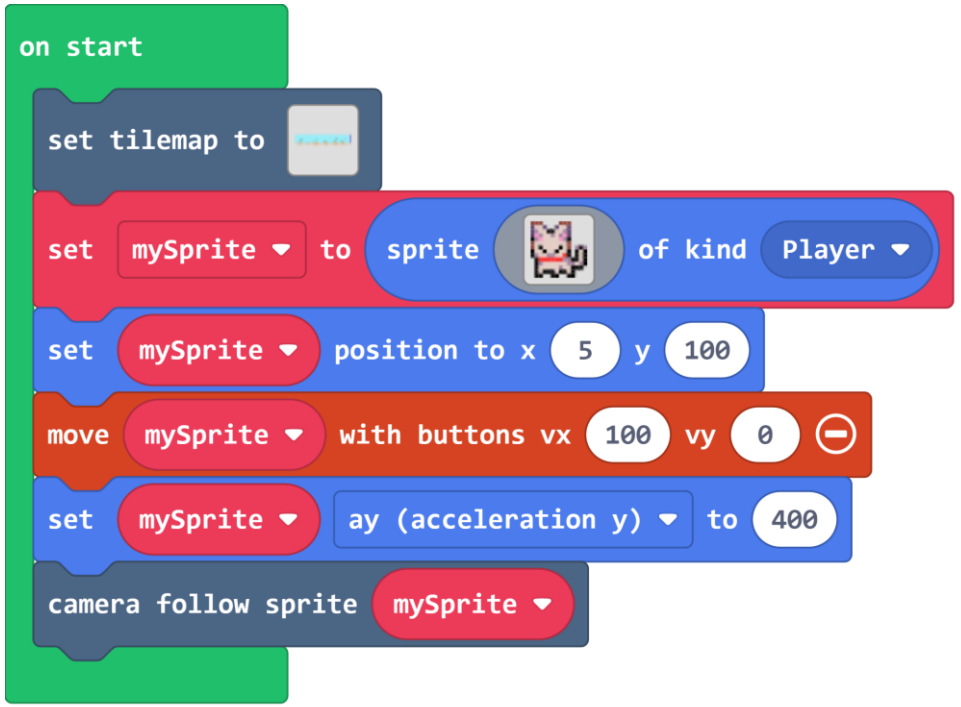
- positive value = left to right
- negative value = right to left

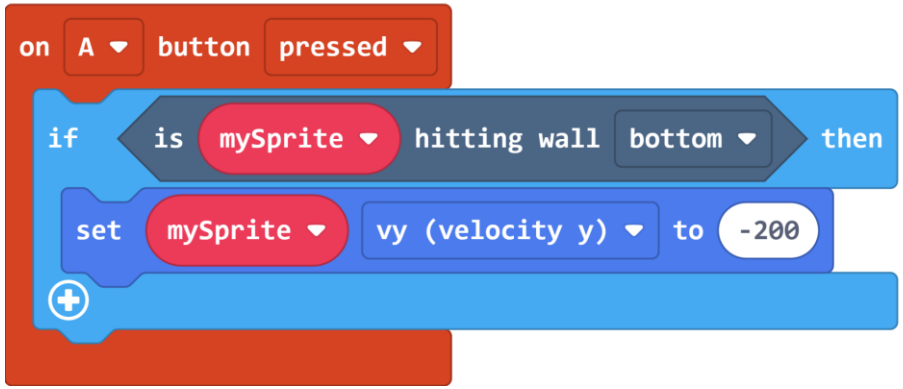
vy = vertical movement

- positive value = top to bottom
- negative value = bottom to top



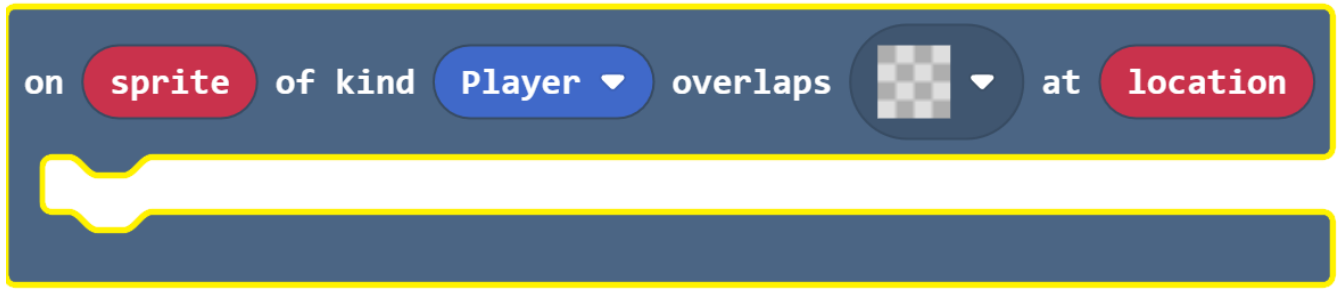
Test your game



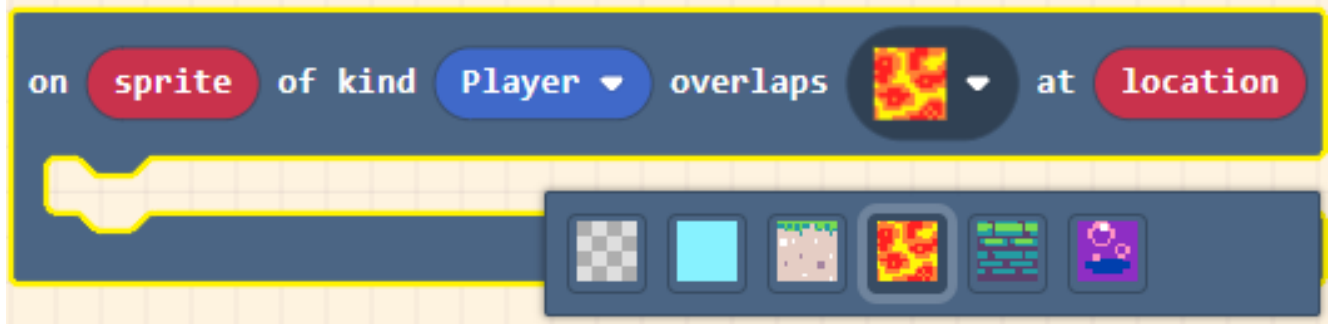


Lose when you fall into a pit

- From the **Scene** Toolbox drawer, drag a **On Sprite Overlaps Tile** block onto the Workspace

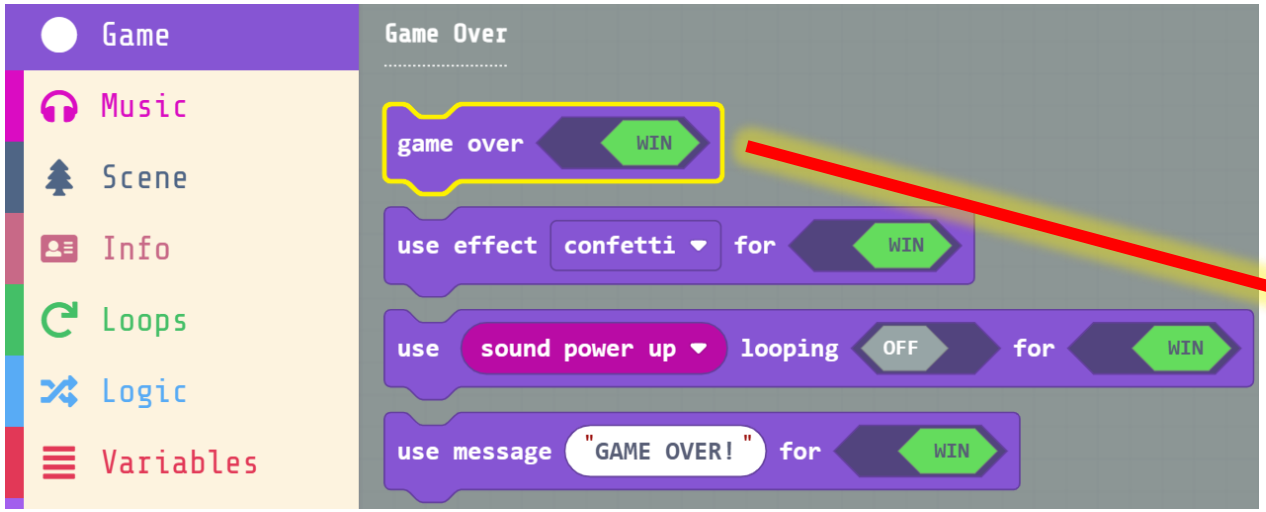


- Click on the checkered Tile drop-down to select your Pit Tile



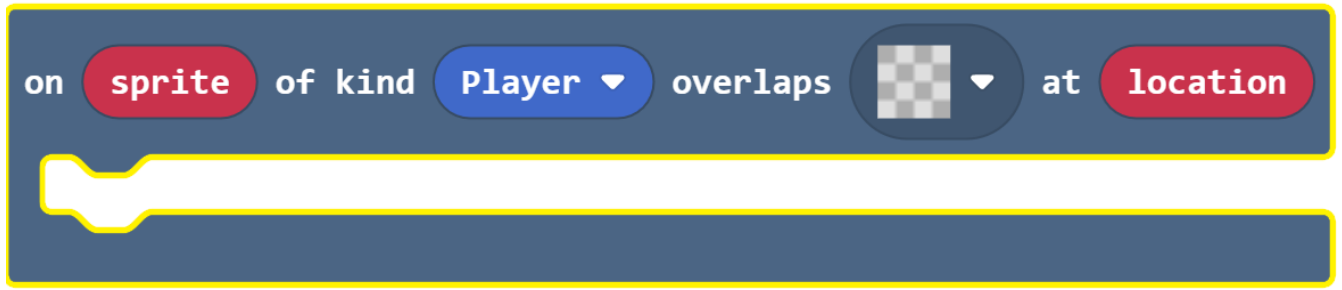
Lose when you fall into a pit

- From the **Game** Toolbox drawer, drag a **Game Over** block onto the **On Sprite Overlaps Tile** block
- Set the value to **LOSE**

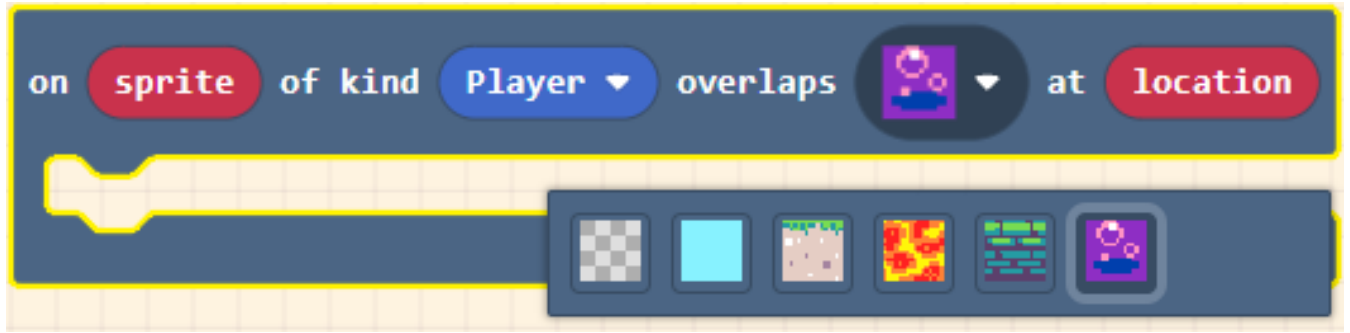


Win when you reach the end

- From the **Scene** Toolbox drawer, drag another **On Sprite Overlaps Tile** block onto the Workspace

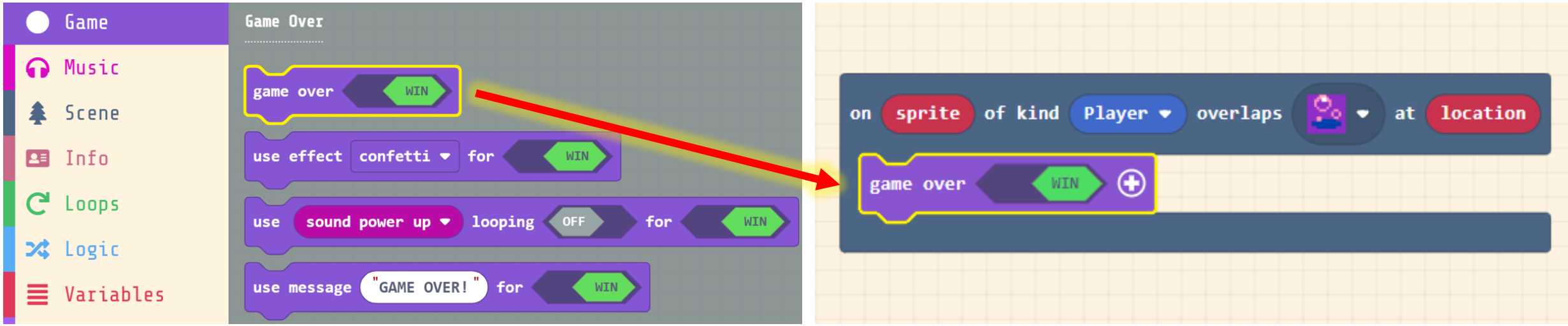


- Click on the checkered Tile drop-down to select your Finish Line Tile

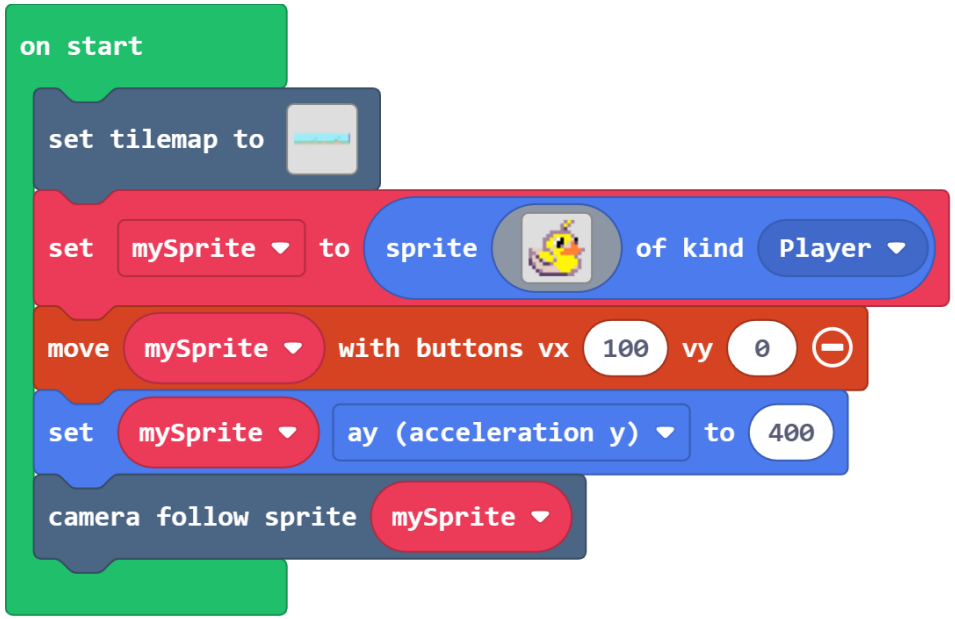


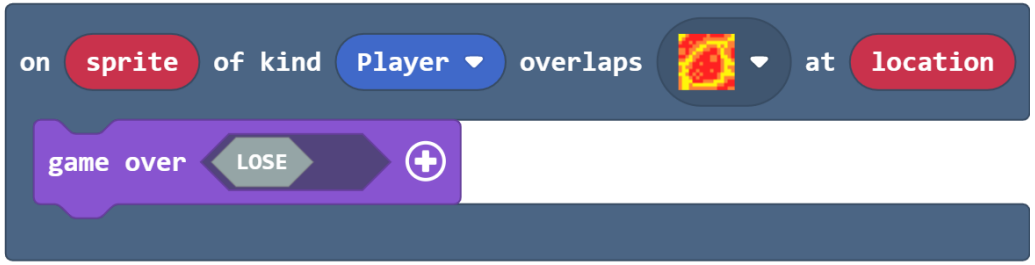
Win when you reach the end

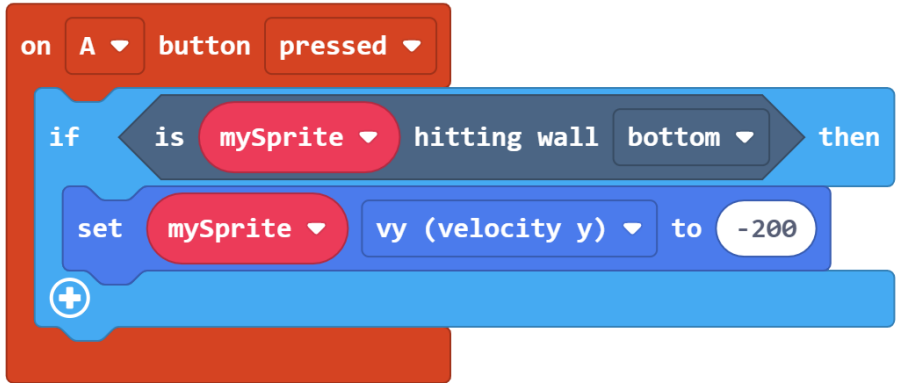
- From the **Game** Toolbox drawer, drag a **Game Over** block onto the **On Sprite Overlaps Tile** block

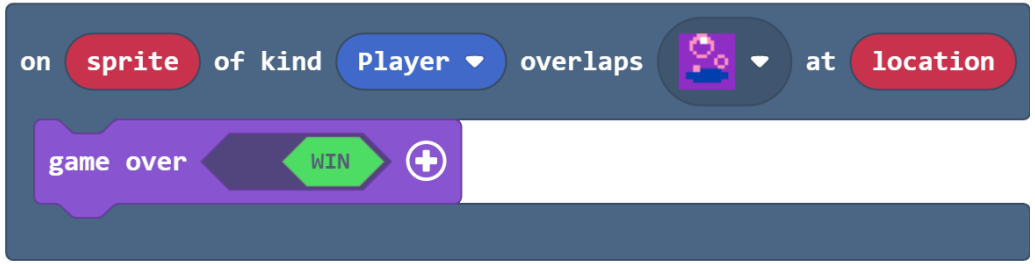


Complete Code









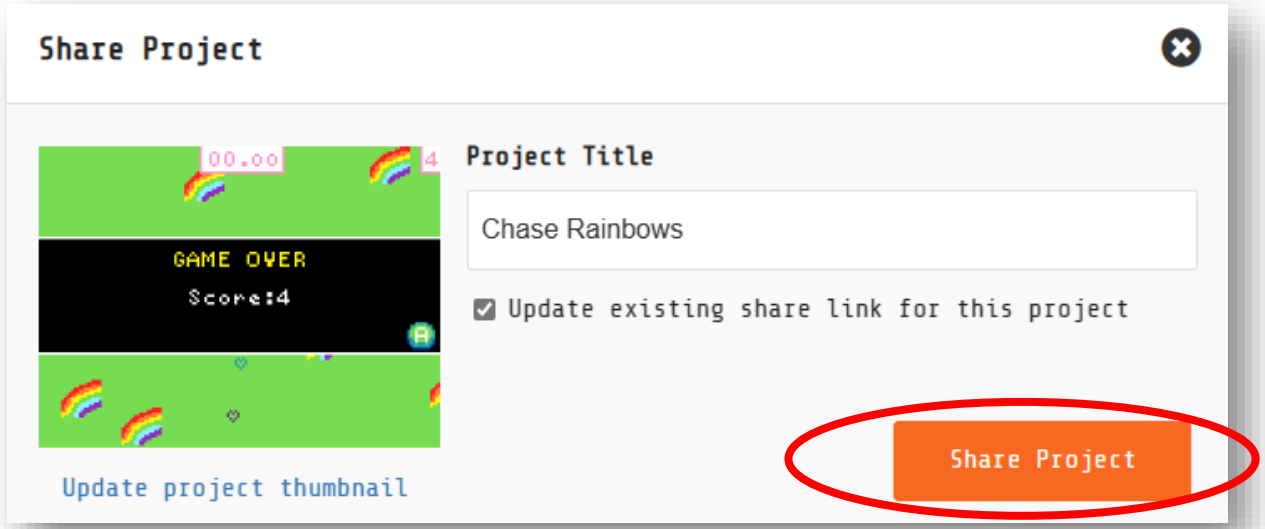
https://makecode.com/_ey6VJcA65UtV

Platformer Mod Ideas

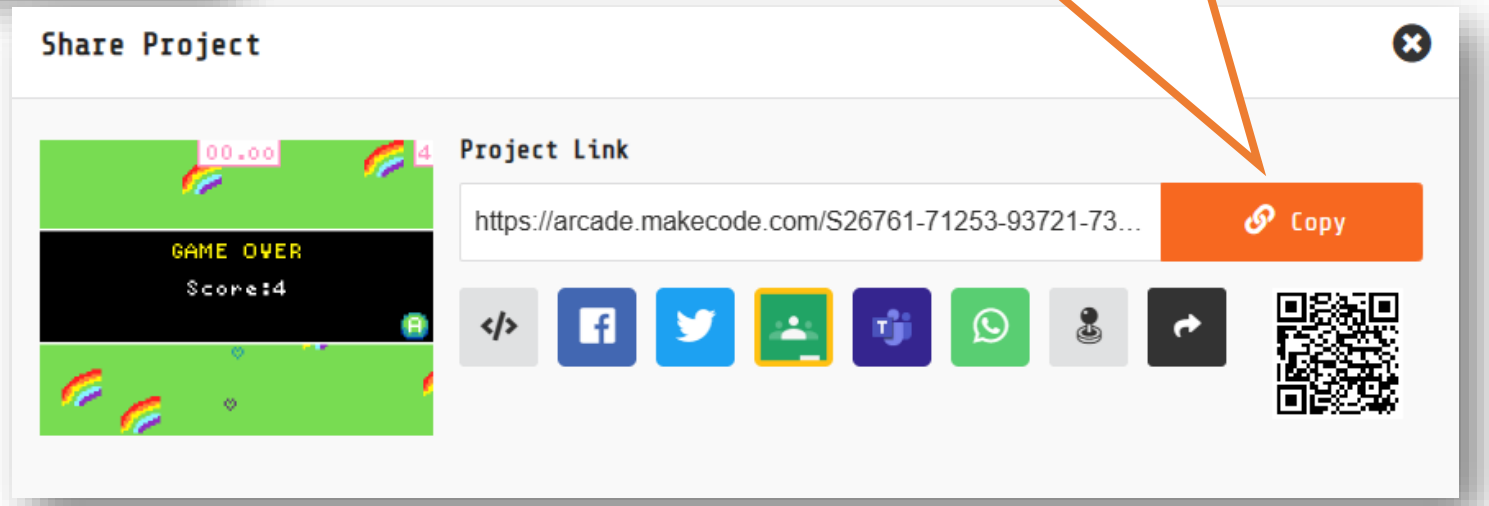
- Add some tiles as objects to collect and gain points
- Add enemies to avoid or battle!
- Add Life & Score
- Add Music and Sound Effects
- Add Animations
- Add multiple Levels

Share your game!

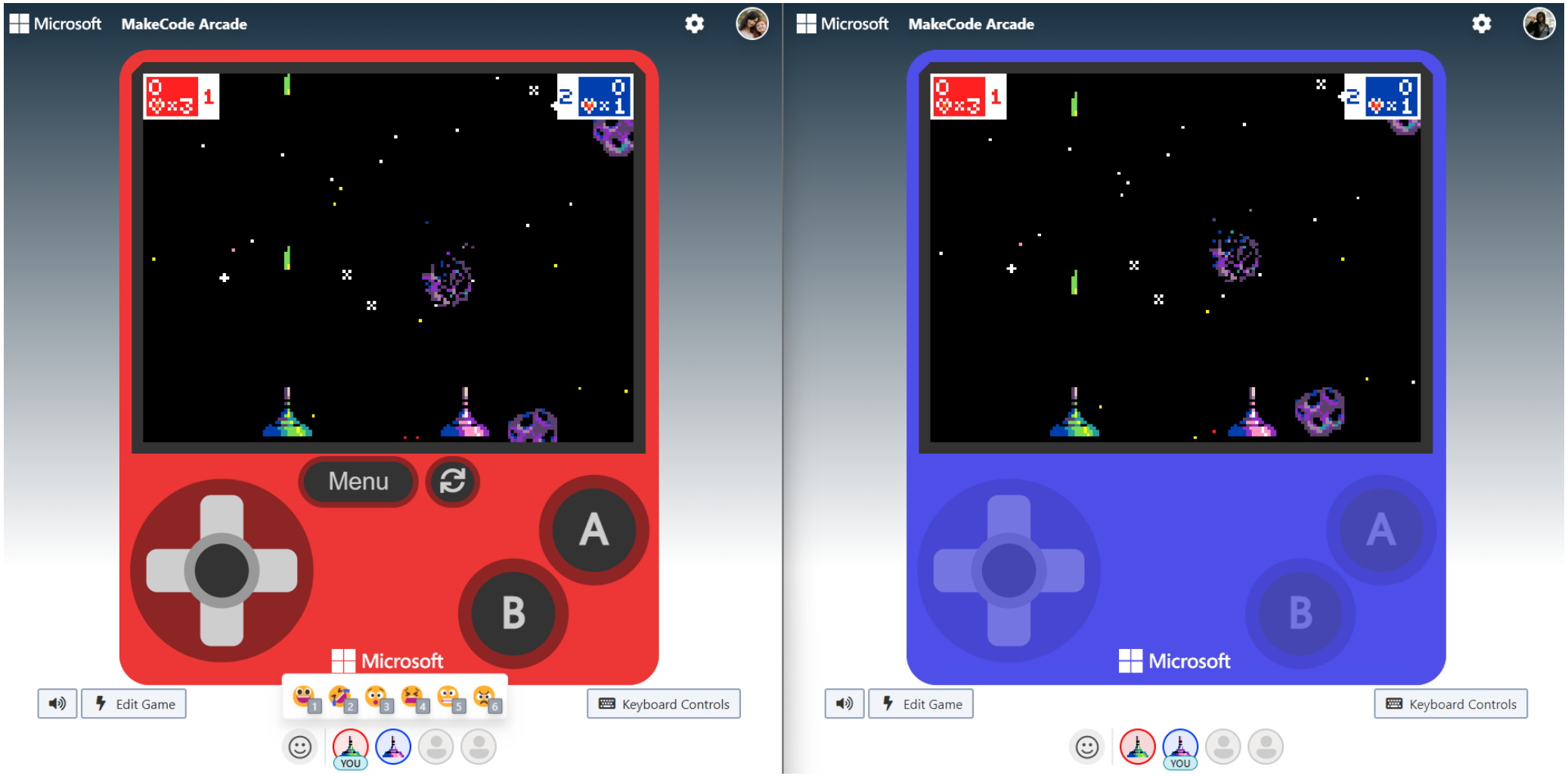
Click the Share button in the top left of the screen



Copy and Paste link into Chat window



Playing games together



arcade.makecode.com/--multiplayer

Arcade Hardware

Boards

These boards run MakeCode Arcade games. Choose a board to find out more about it and where you can get one!

BrainPad Arcade

Learn how BrainPad Arcade lets you run games on a small handheld console.

Meowbit

A retro game console for STEM education from Kittenbot team.

Adafruit PyBadge

It's a badge, it's an arcade, it's a PyBadge.

Adafruit PyGamer

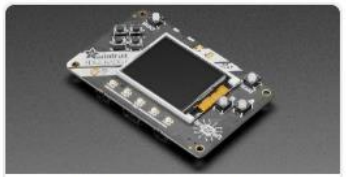
The upgraded PyBadge.

Kitronik ARCADE

ARCADE is a programmable gamepad for use with MakeCode Arcade.

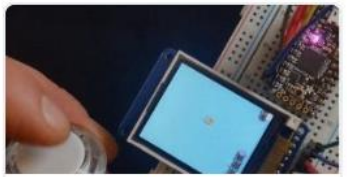
Ovobot Xtron

A programmable microcomputer that can be used for making MakeCode Arcade games.



Adafruit EdgeBadge

It's the PyBadge with a zest of Machine learning.



Adafruit M4

Learn how to run your games on micro-controllers from Adafruit.

Adafruit Joy Bonnet

Learn how to run your games on Raspberry Pi Zero and Adafruit Joy Bonnet.

arcade.makecode.com
/hardware

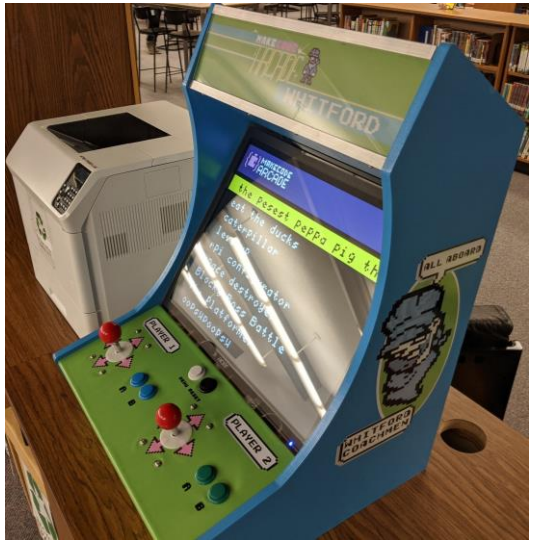
Arcade Cabinets & Controllers

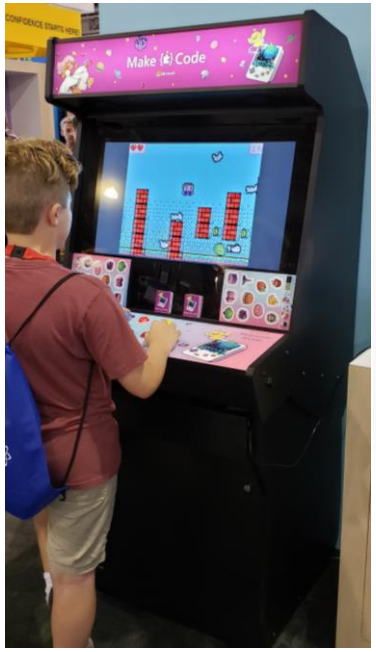
Cardboard Panel

Turn a cardboard box into a tabletop arcade.

Arcade table

Turn an IKEA FLISAT table into an arcade.





Arcade Kiosk Mode

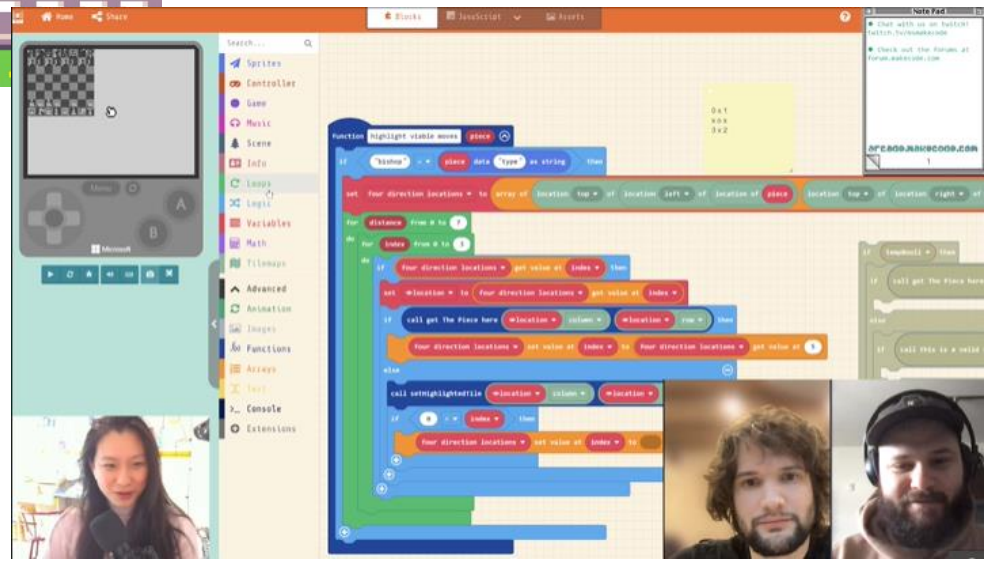
arcade.makecode.com/hardware/kiosk

MakeCode Arcade Live Stream & Forum

1pm Pacific / 3pm Eastern MWF

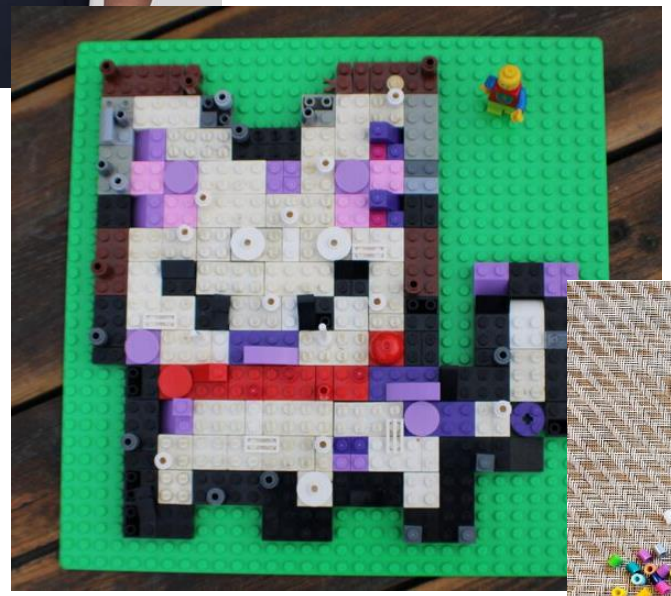
twitch.tv/msmakecode

forum.makecode.com



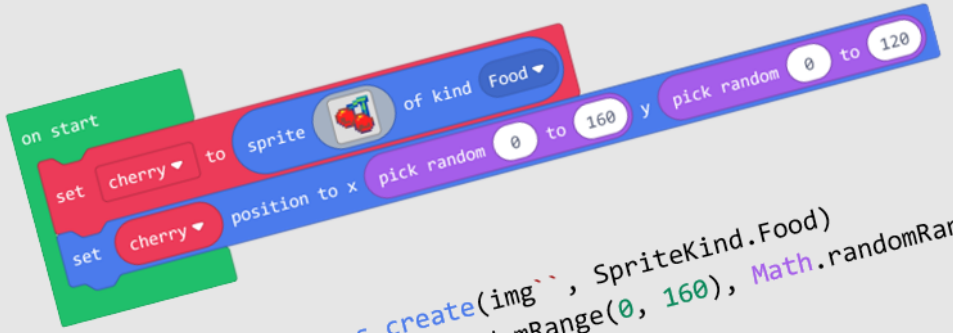
MakeCode Engineers

Arts & Crafts



https://arcade.makecode.com/arts-and-crafts

https://arcade-stencils.glitch.me




```
let cherry = sprites.create(img`` , SpriteKind.Food)
cherry.setPosition(Math.randomRange(0, 160), Math.randomRange
```

Thank You!