

```
on start
  set cherry to sprite of kind Food
  set cherry position to x pick random 0 to 160 y pick random 0 to 120
```

```
let cherry = sprites.create(img, SpriteKind.Food)
cherry.setPosition(Math.randomRange(0, 160), Math.randomRange(0, 120))
```

Microsoft MakeCode



< Instructor Name >

< Title >

How to create an Arcade Game



Microsoft MakeCode



Inspiring new generations of technology creators
through immersive, hands-on computing education

Learn more
makecode.com

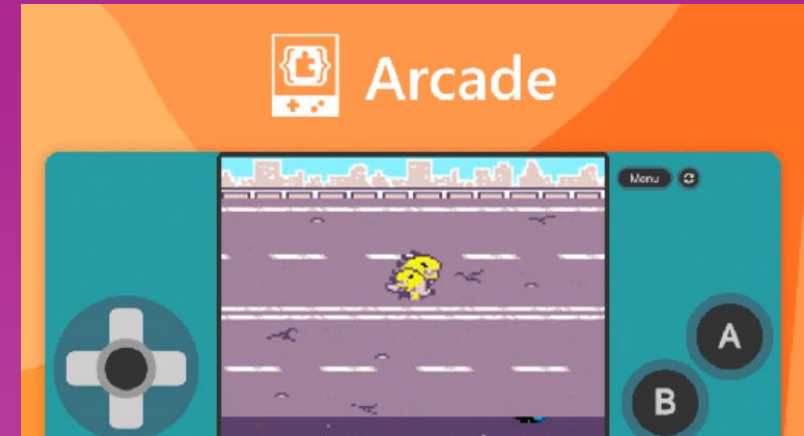
Three Main Code Editors



Physical Computing with micro:bit

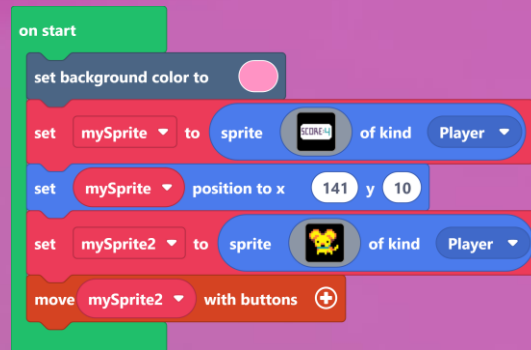


Mods in Minecraft

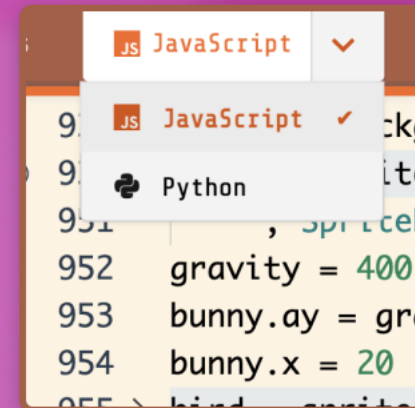


Retro Arcade Games

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



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.

Examples of Arcade Games?

Pac-Man



Space Invaders



Donkey Kong



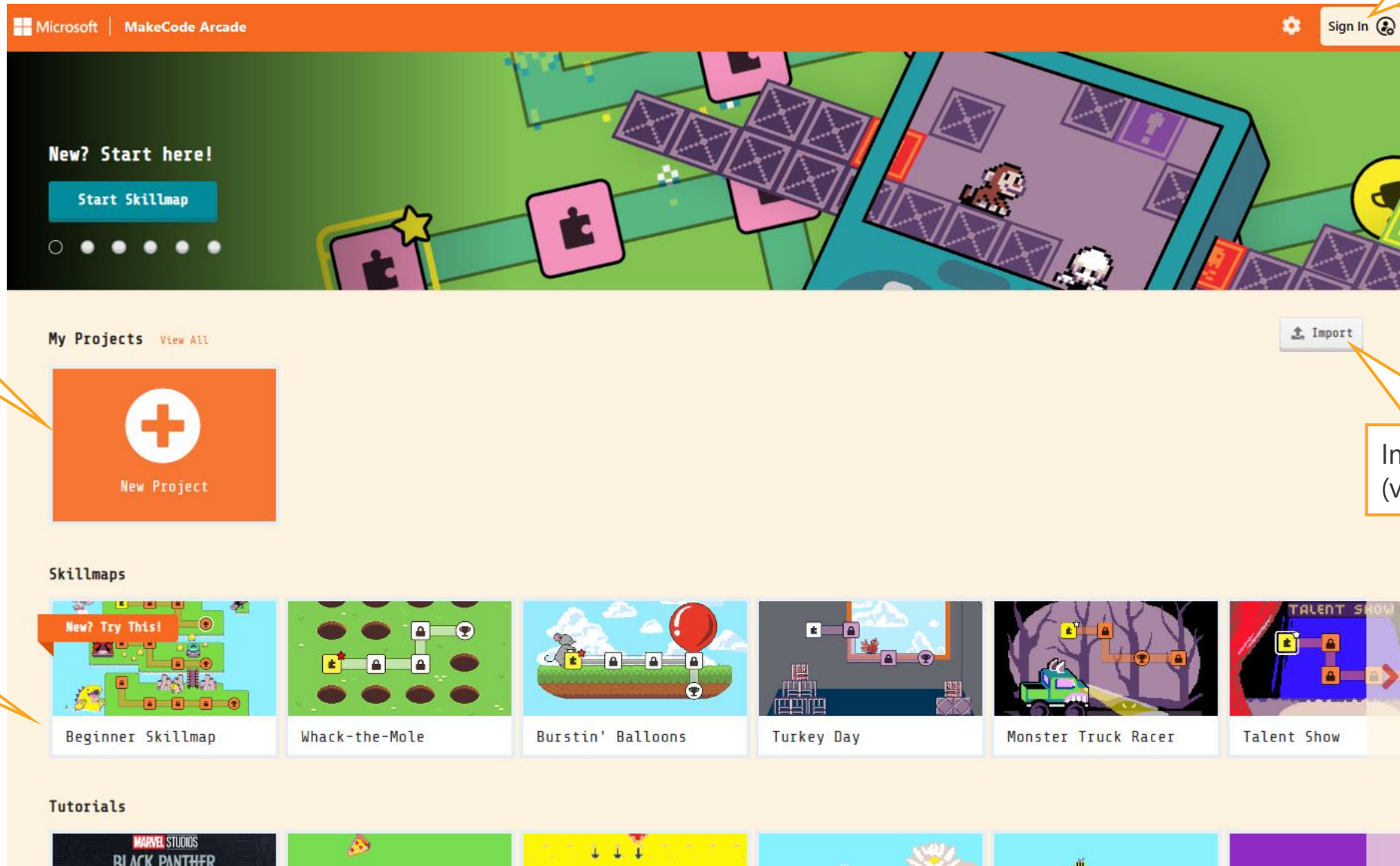
Let's create a Maze Game!

Navigate your player
through the maze before
time runs out!



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)

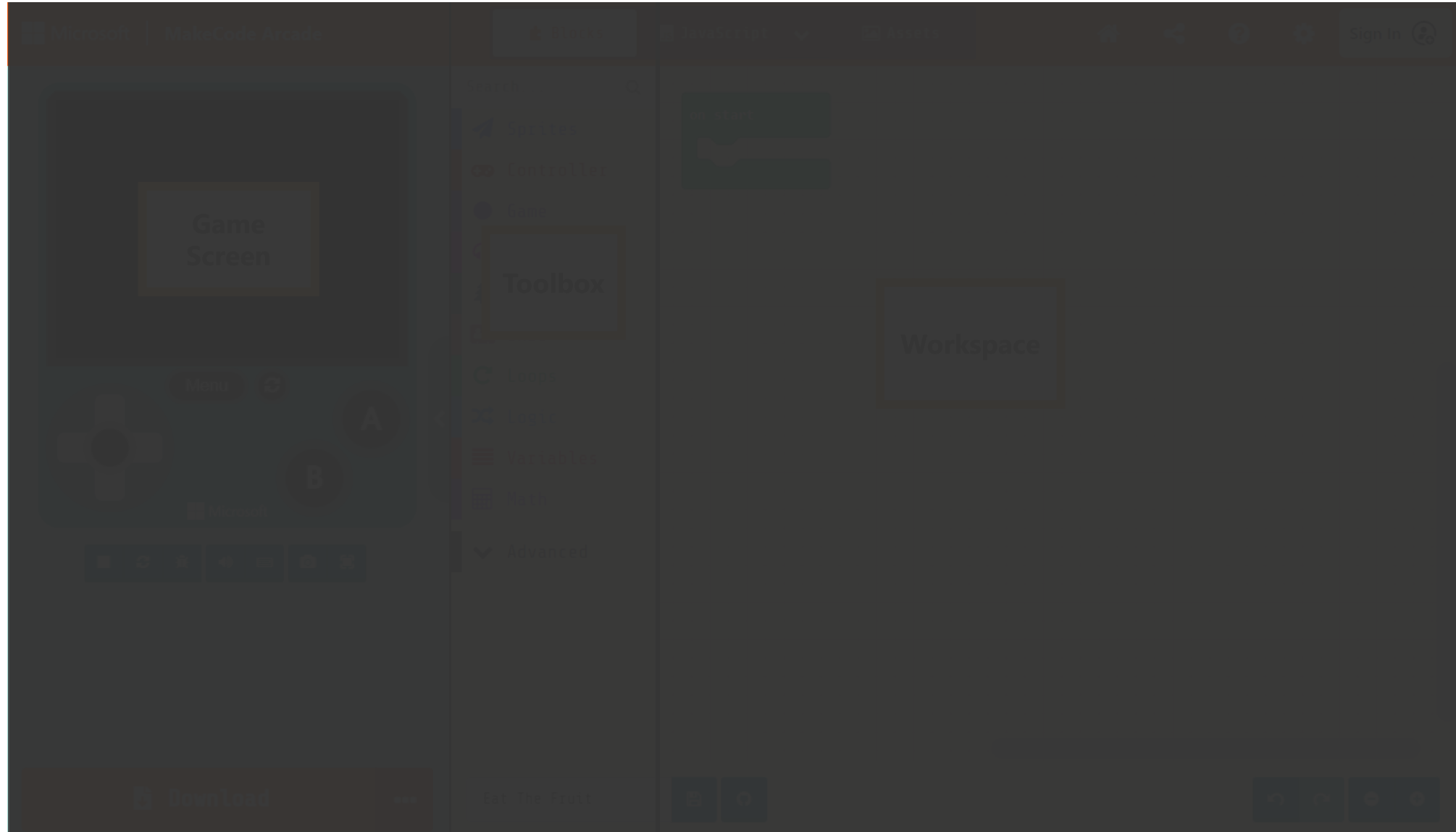
Step-by-step Skillmaps and Tutorials

Create a New Project

The screenshot shows the Microsoft MakeCode Arcade interface. At the top, there is a navigation bar with the Microsoft logo, 'MakeCode Arcade', a settings gear icon, and a 'Sign In' button. Below the navigation bar is a hero section with the text 'New? Start here!' and a 'Start Skillmap' button. The main content area is divided into three sections: 'My Projects', 'Skillmaps', and 'Tutorials'. In the 'My Projects' section, there is a prominent orange square button with a white plus sign and the text 'New Project', which is circled in purple. To the left of this button, there is a handwritten purple note that says 'Click on New Project' with an arrow pointing to the button. The 'Skillmaps' section features a 'New? Try This!' banner and several skillmap thumbnails, including 'Beginner Skillmap', 'Whack-the-Mole', 'Burstin' Balloons', 'Turkey Day', 'Monster Truck Racer', and 'Talent Show'. The 'Tutorials' section is partially visible at the bottom, showing a 'MARVEL STUDIOS BLACK PANTHER' tutorial. A 'Create a Project' dialog box is open in the center, with the title 'Create a Project' and two smiley face emojis. It prompts the user to 'Give your project a name.' and has a text input field containing 'Space Game!'. Below the input field is a '> Code options' link and a green 'Create' button with a checkmark icon.

Click on
New Project

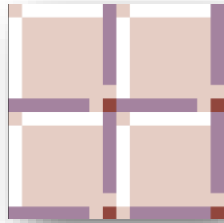
Getting familiar with MakeCode Arcade



Tiles and Tilemaps

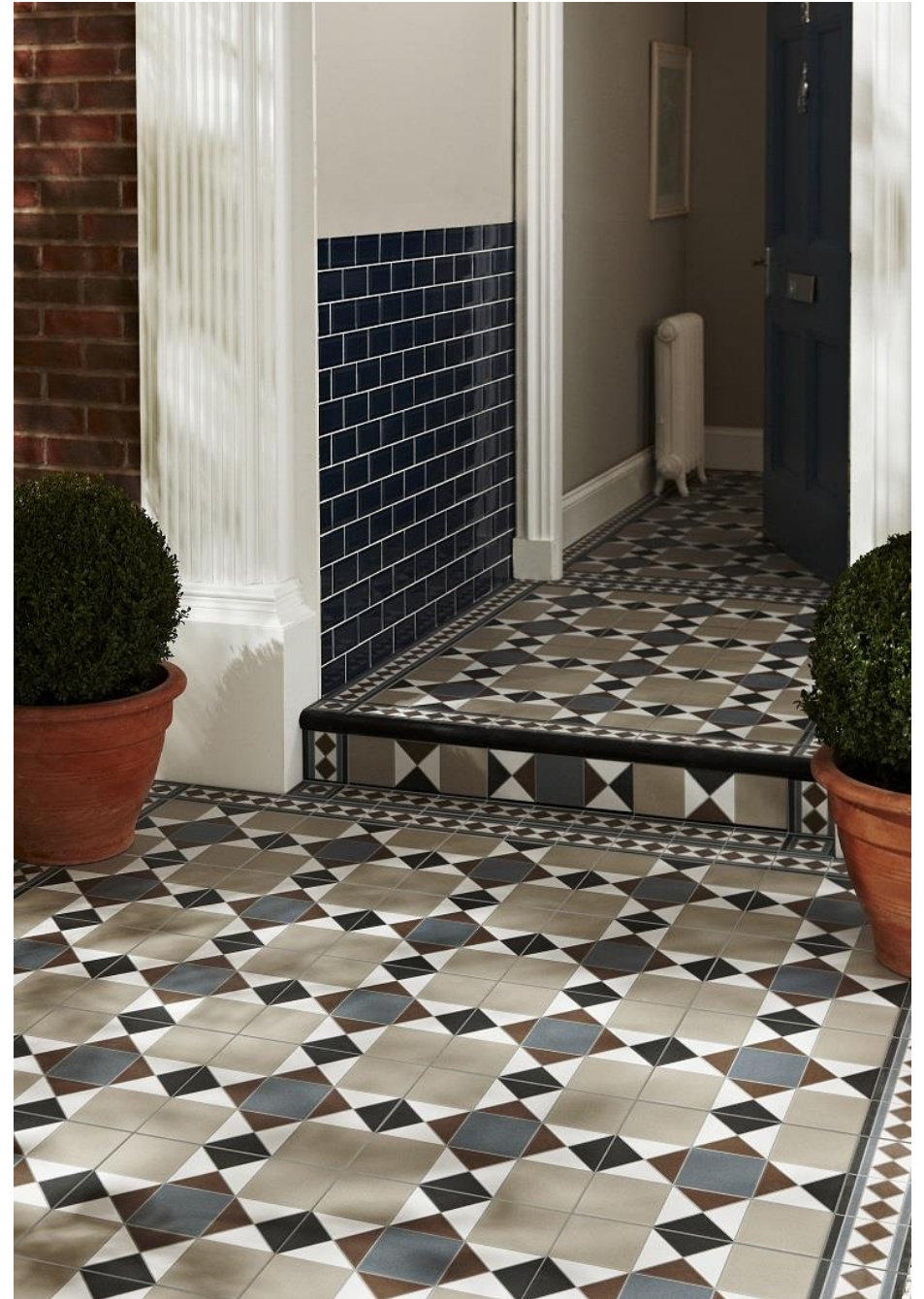
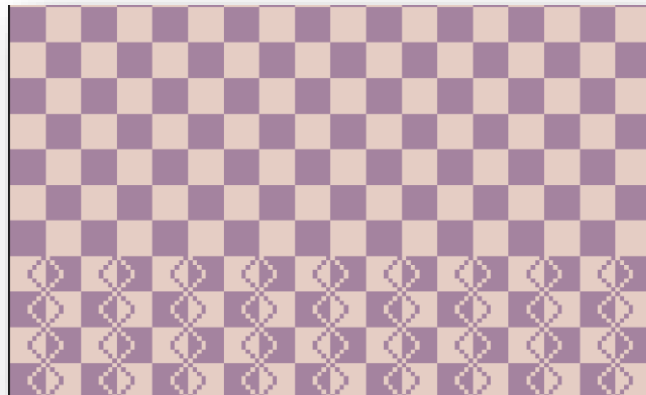
- What is a Tile?

A square pattern



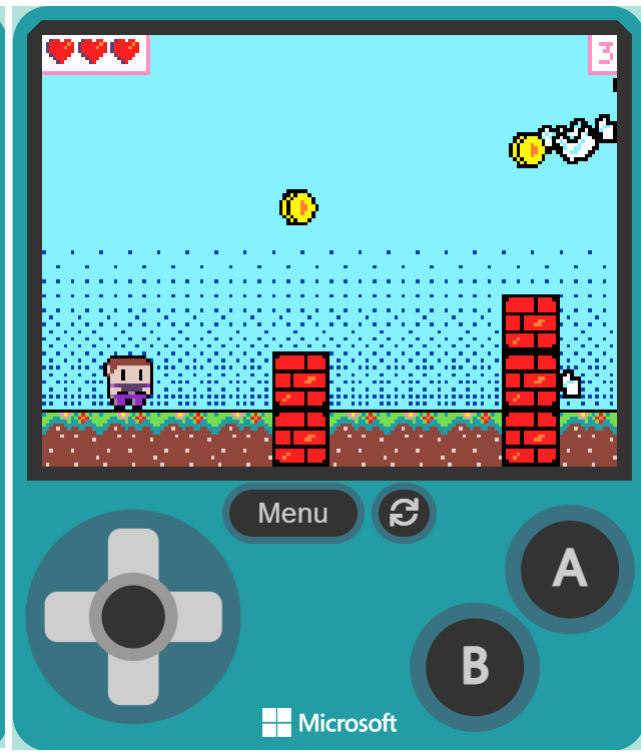
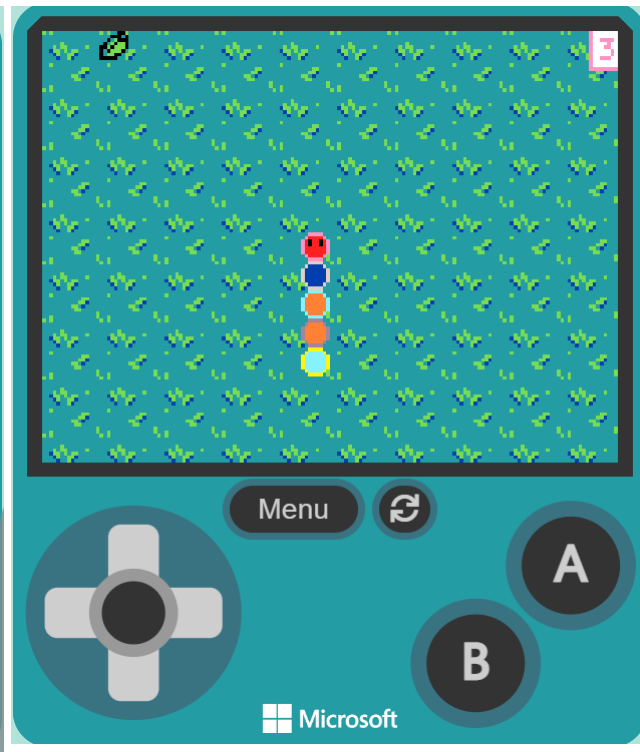
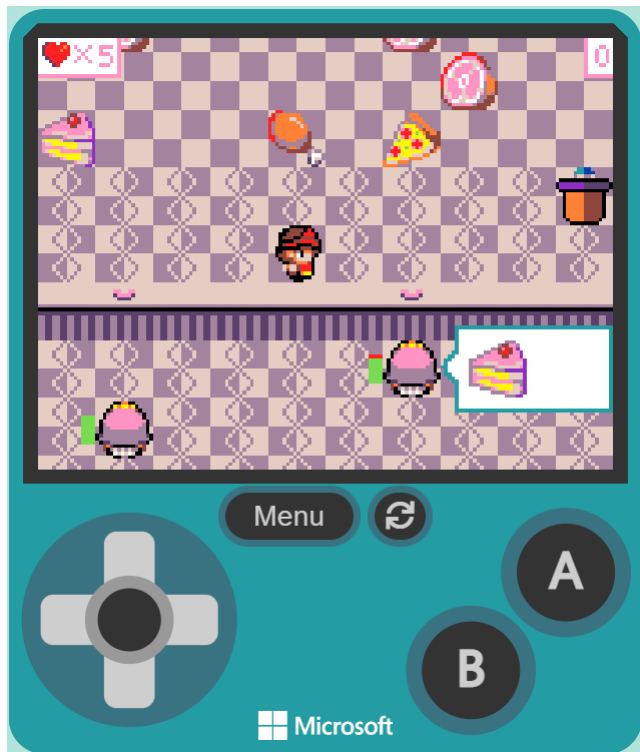
- What is a Tilemap?

A collection of tiles



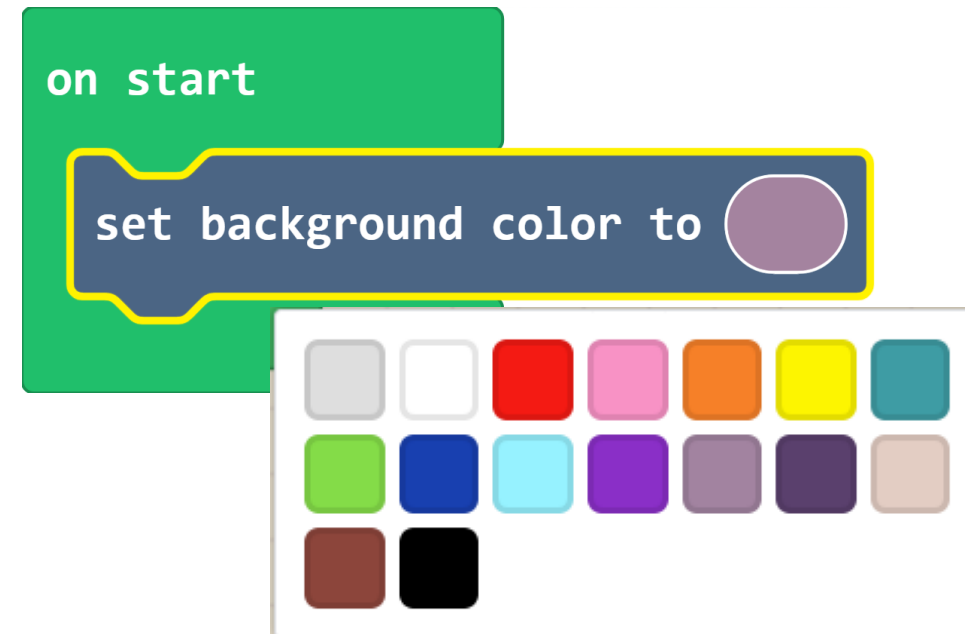
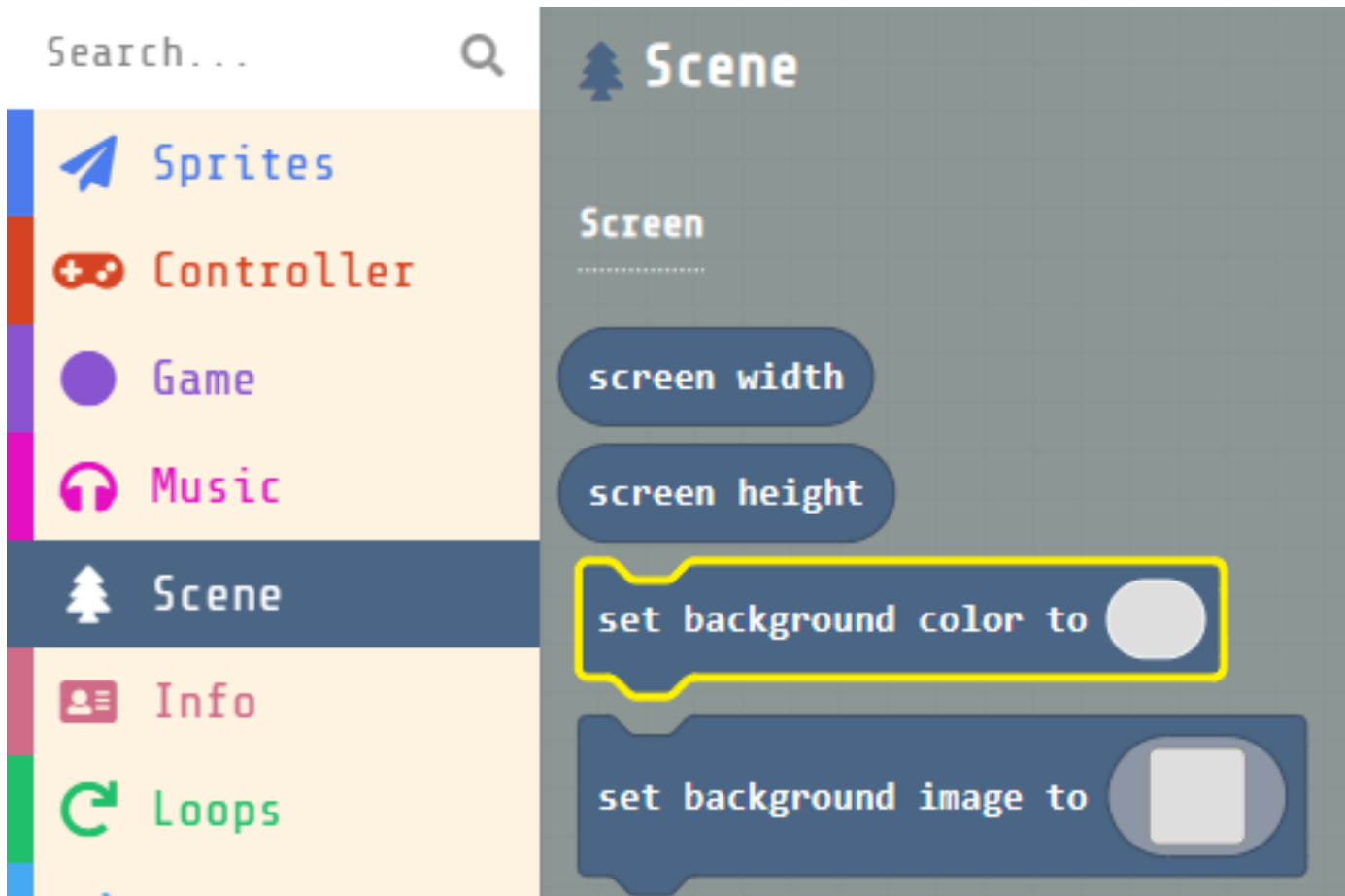
Tilemap Games

Tilemaps are good for top-down perspective (maze, adventure) or side-view perspective games (platformer, side-scroller)

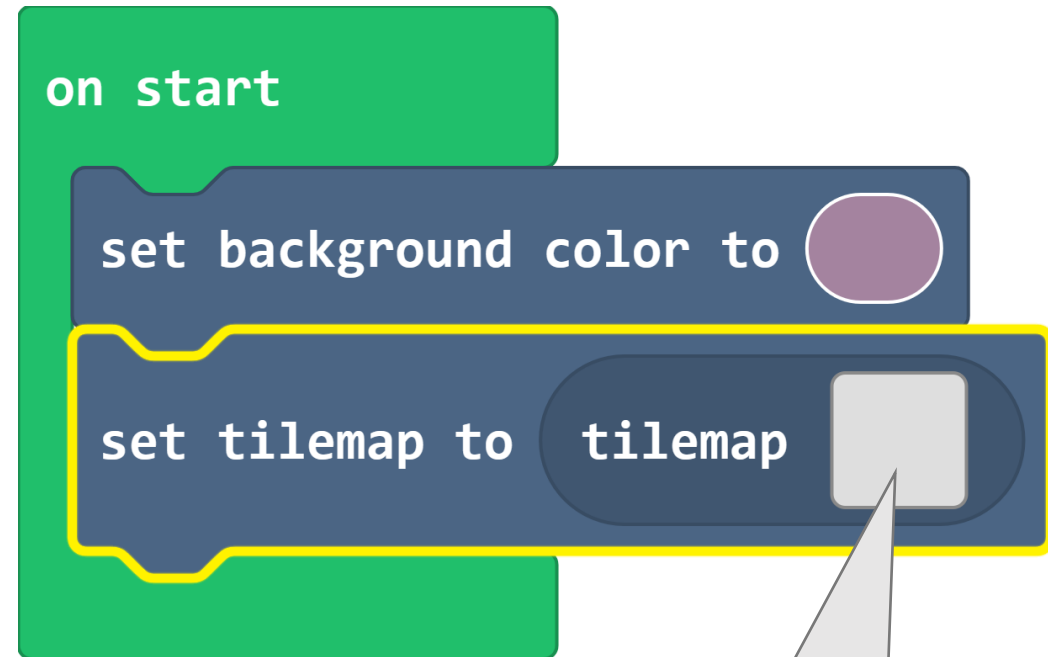


Set the Background Color

This will be the color of the path through your maze



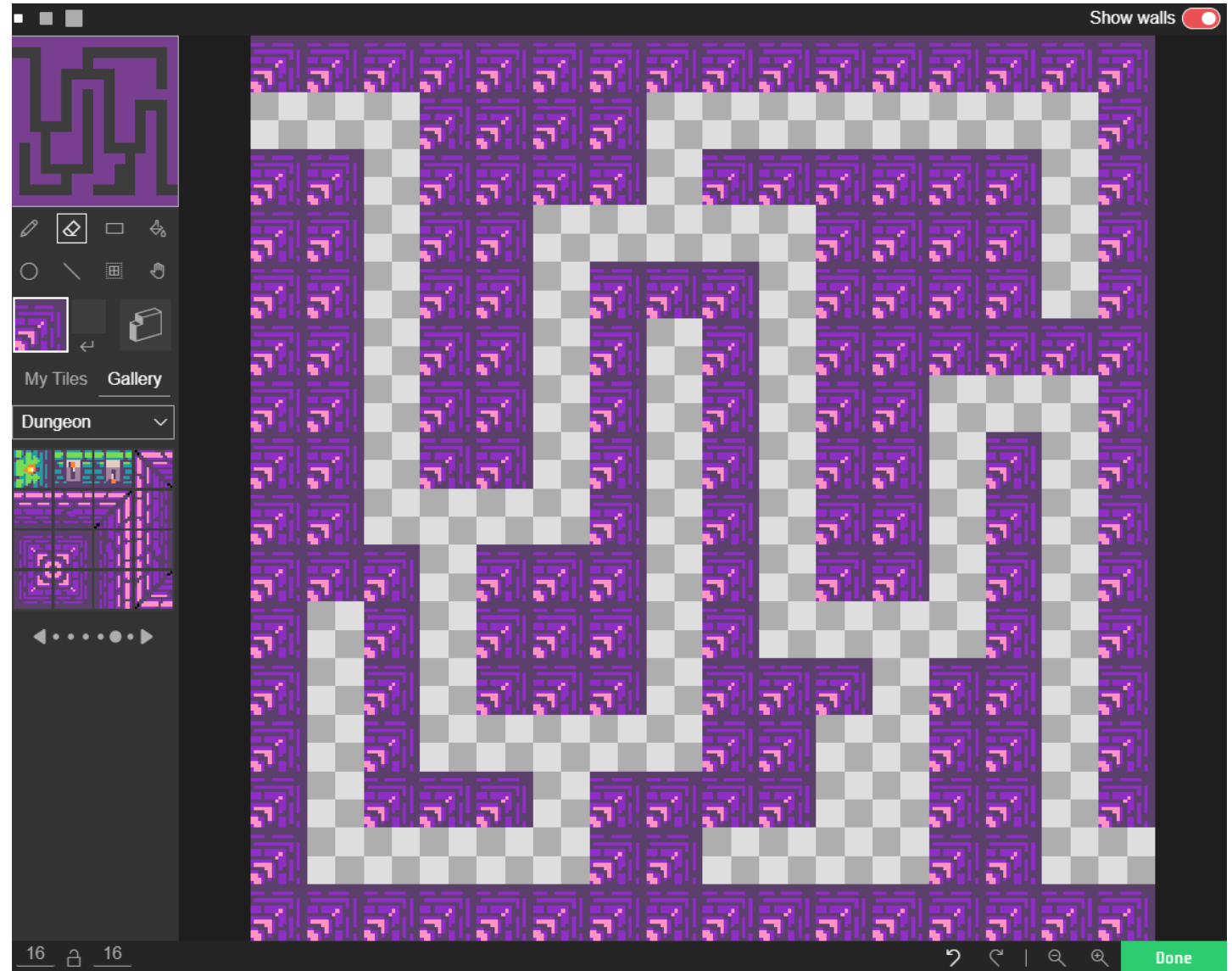
Create the Tile Map



Click on grey box to open Tilemap Editor

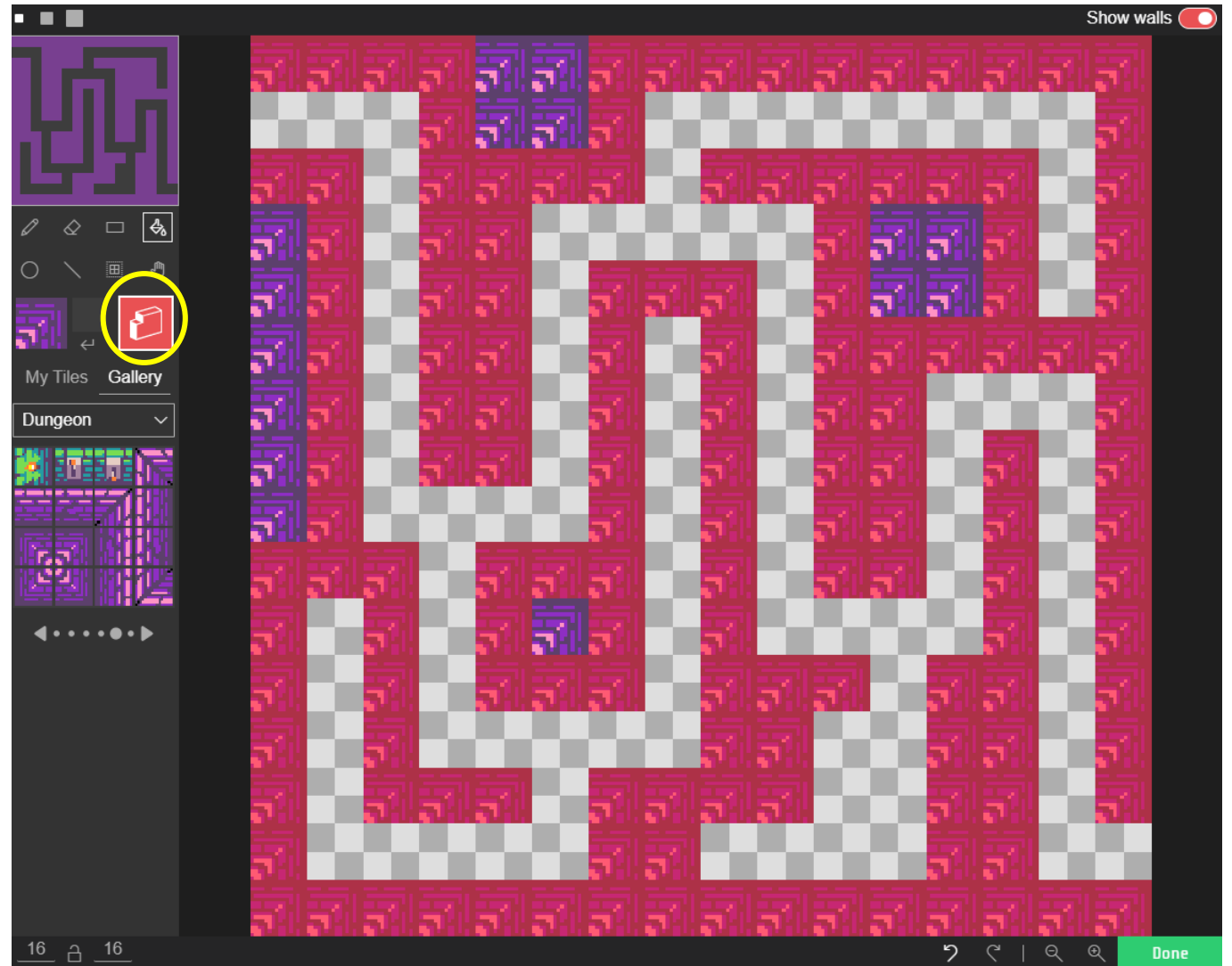
Pick or Draw a Tile for Walls

- Draw your Maze
- Leave an opening for the Start and End of the Maze
- Note – if your walls are all the same tile, you can use the Fill tool to cover the canvas, and then use the Erase tool to draw the passageways



Draw the Walls

- Use the Wall Tool to draw the walls around the passageways
- Note – you can also use the Fill Tool to fill in the Wall on your Tiles

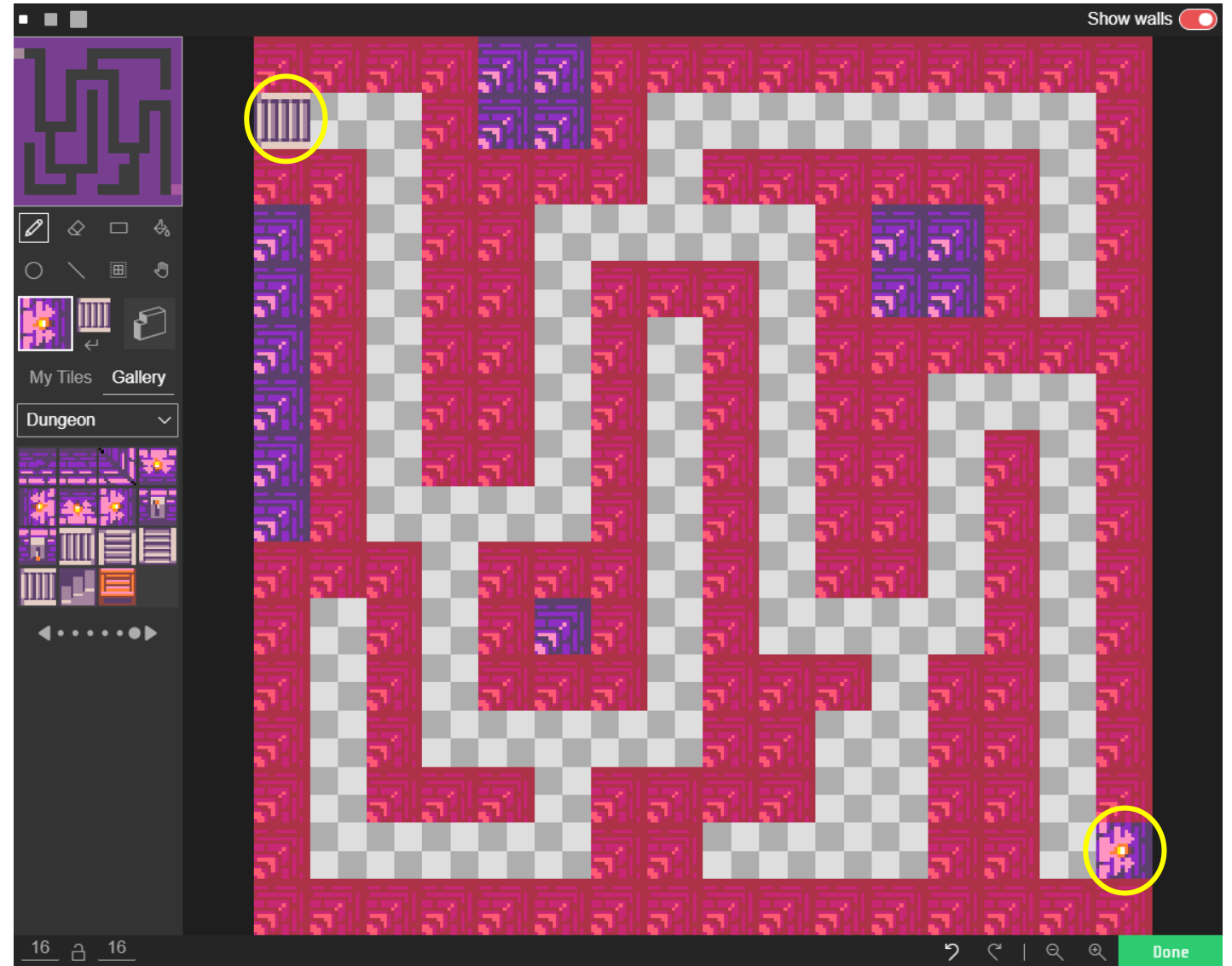


Create the Start and End tiles

Pick (or draw your own) Tiles –

- 1 to represent the Starting point
- 1 to represent the End of the Maze

Click **Done** to close the Tile Map Editor



Create a Player Sprite

Sprites

on start

set background color to

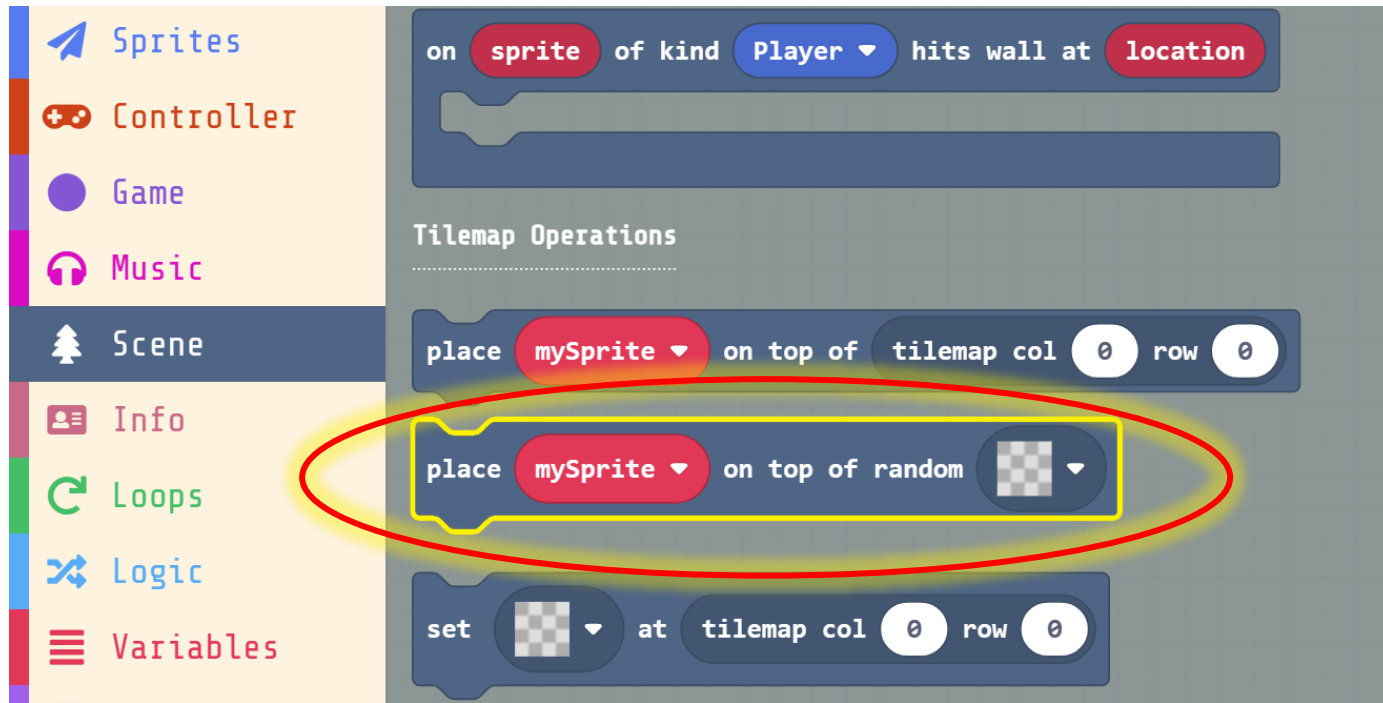
set tilemap to

set mySprite to sprite of kind Player



Tip – make sure your Sprite is small enough to fit through the Maze passageways

Position your Sprite at the starting point



The image shows the Scratch code editor interface. On the left is a sidebar with categories: Sprites, Controller, Game, Music, Scene, Info, Loops, Logic, and Variables. The main workspace contains several code blocks under the 'Tilemap Operations' section:

- on sprite of kind Player hits wall at location
- place mySprite on top of tilemap col 0 row 0
- place mySprite on top of random (with a checkerboard tile icon selected)
- set (with a checkerboard tile icon) at tilemap col 0 row 0

The 'place mySprite on top of random' block is highlighted with a yellow border and a red oval.



The image shows a Scratch code editor workspace with the following code blocks:

- on start
- set background color to (purple)
- set tilemap to (maze tilemap icon)
- set mySprite to sprite (player icon) of kind Player
- place mySprite on top of random (with a vertical lines tile icon selected)

A tooltip points to the 'place mySprite on top of random' block, containing the text: "Click to select Start Tile".

Click to select Start Tile

Control movement of your Sprite

 Controller

on start

set background color to 

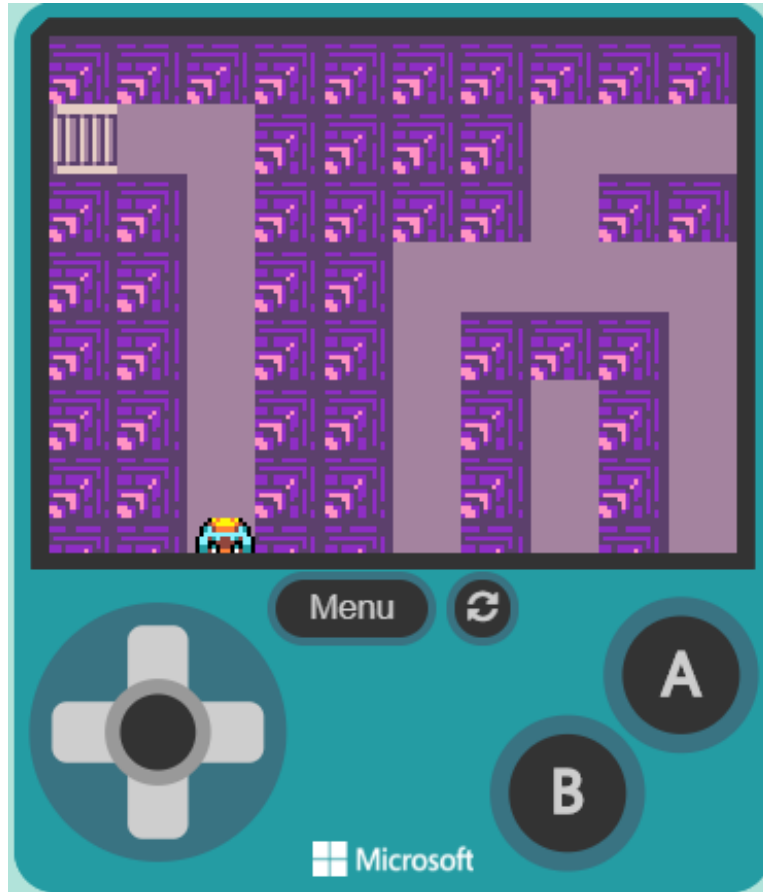
set tilemap to 

set mySprite ▼ to sprite  of kind Player ▼

place mySprite ▼ on top of random 

move mySprite ▼ with buttons 

Try it out in the Simulator



What happens when your Player moves off the screen?

Camera to follow Sprite

The screenshot shows the 'Camera' extension interface in Scratch. On the left is a sidebar with categories: Scene, Info, Loops, Logic, Variables, Math, and Extensions. The main area is titled 'Camera' and contains several blocks: 'camera follow sprite mySprite', 'camera shake by 4 pixels for 500 ms', 'center camera at x 0 y 0', and a 'camera x' dropdown menu. A yellow highlight is around the 'camera follow sprite' block, and a red arrow points from it to the corresponding block in the code editor on the right.

The screenshot shows a Scratch script on a grid background. The script starts with an 'on start' block. It contains the following blocks in order: 'set background color to' (with a purple color swatch), 'set tilemap to' (with a maze tilemap icon), 'set mySprite to sprite of kind Player' (with a player sprite icon), 'place mySprite on top of random' (with a random placement icon), 'move mySprite with buttons' (with a plus sign icon), and 'camera follow sprite mySprite'. A yellow highlight is around the 'camera follow sprite' block, and a red arrow points from it to the corresponding block in the 'Camera' extension interface on the left.

Set Countdown



```
on start
  set background color to [purple circle]
  set tilemap to [maze icon]
  set mySprite to sprite [player icon] of kind Player
  place mySprite on top of random [wall icon]
  move mySprite with buttons (+)
  camera follow sprite mySprite
  start countdown 20 (s)
```

Start with 20 seconds

Win when you reach the End point

The screenshot shows the Scratch Tilemaps editor interface. On the left is a sidebar with categories: Sprites, Controller, Game, Music, Scene, Info, Loops, Logic, Variables, and Math. The main workspace is titled 'Tilemaps' and contains a 'set tilemap to' block with a 'tilemap' dropdown. Below it is a 'tilemap' dropdown. The main area features two event blocks: 'on sprite of kind Player overlaps' and 'on sprite of kind Player hits wall at'. The 'overlaps' block is highlighted with a yellow border and contains a checkerboard tile icon. A red arrow points from the 'overlaps' block to a zoomed-in view on the right.

This is a zoomed-in view of the 'on sprite of kind Player overlaps' event block. The block is highlighted with a yellow border. The 'overlaps' dropdown menu is open, showing a list of tile icons. The 'End Tile' icon, which is a purple and yellow starburst, is selected. A callout box points to this icon with the text 'Click to select End Tile'.

Click to select
End Tile

Win when you reach the End point

Search...

- Sprites
- Controller
- Game**
- Music
- Scene
- Info
- Loops
- Logic
- Variables
- Math
- Extensions
- Advanced

Game

Gameplay

- on game update
- on game update every 500 ms
- time since start (ms)
- reset game

Game Over

- game over
- use effect confetti for

on **sprite** of kind **Player** overlaps at **location**

game over

Complete Code

```
on start
  set background color to #808080
  set tilemap to [tilemap]
  set mySprite to sprite [player] of kind Player
  place mySprite on top of random [background]
  move mySprite with buttons
  camera follow sprite mySprite
  start countdown 20 (s)

on sprite of kind Player overlaps [tile] at location
  game over WIN
```



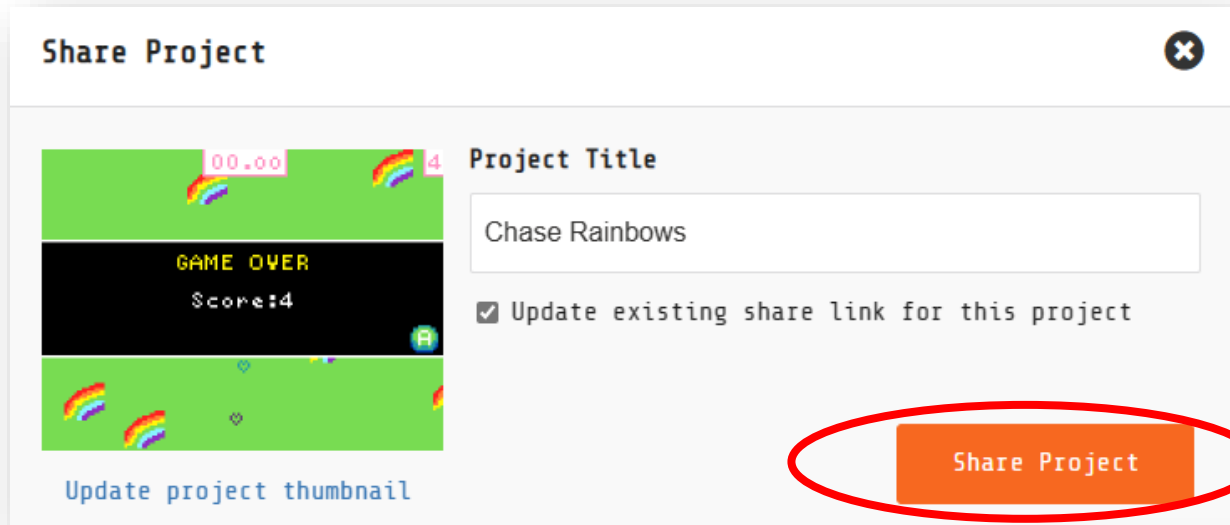
https://makecode.com/_gf1YuFJvkhYp

Maze Mod Ideas

- Add some tiles as objects to collect and gain points
- Add enemies to avoid or battle!
- Add traps
- Add hidden rooms to unlock
- Add Sprite dialog bubbles for more storytelling
- Add music and effects
- Add Animations

Share your game!

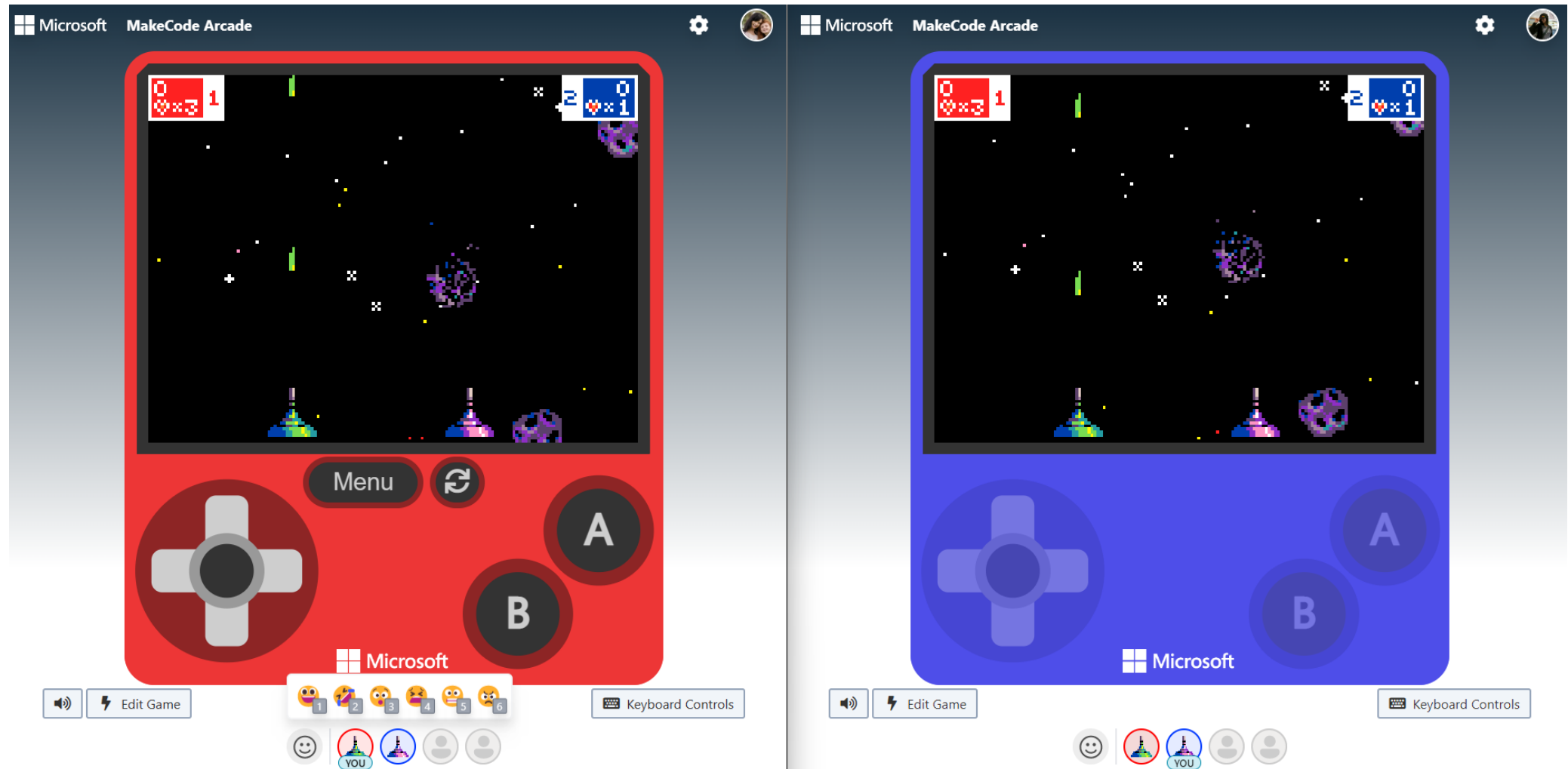
Click the Share button in the top left of the screen



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.

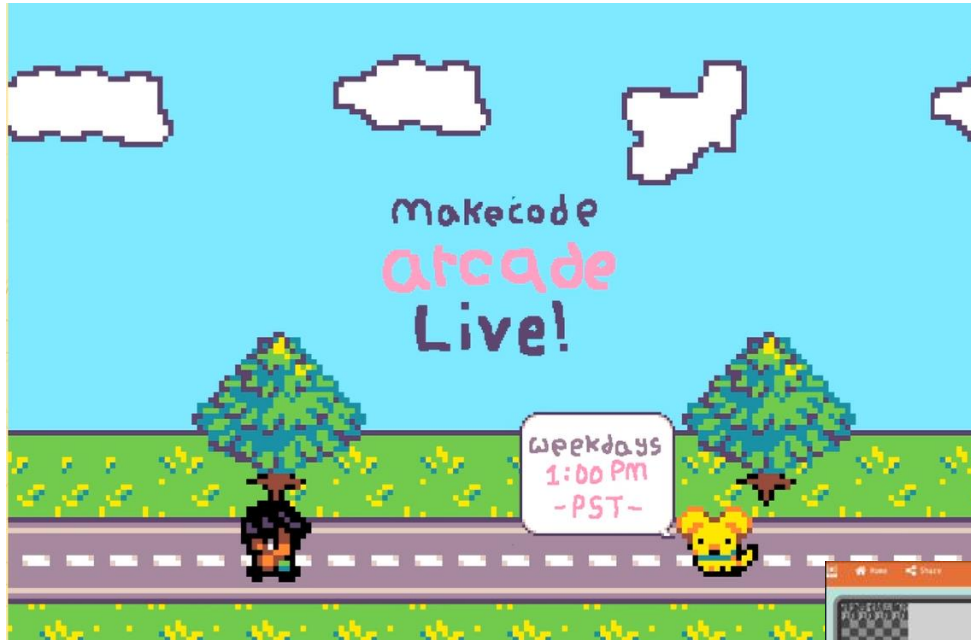


Arcade Kiosk Mode



arcade.makecode.com/hardware/kiosk

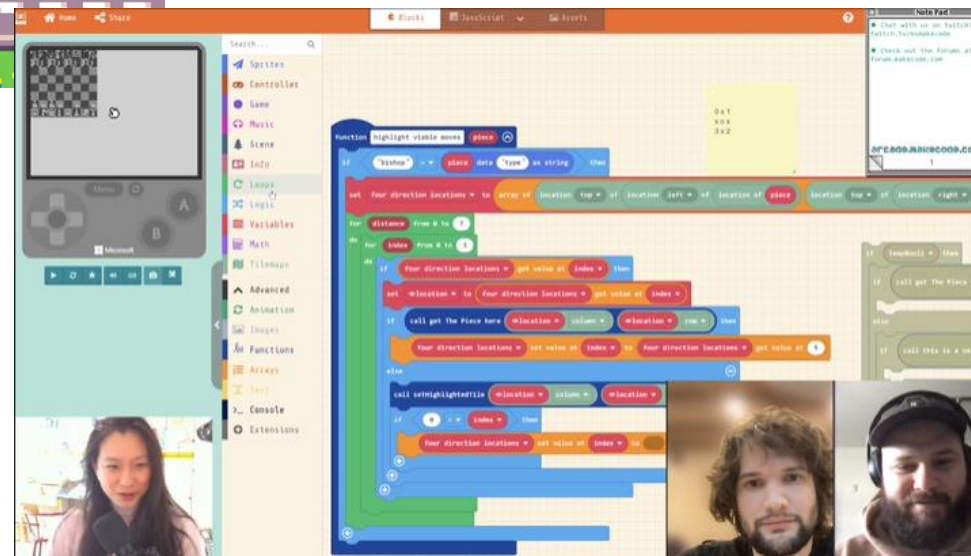
MakeCode Arcade Live Stream & Forum



1pm Pacific / 3pm Eastern MWF

twitch.tv/msmakecode

forum.makecode.com



MakeCode
Engineers

Thank You!

```
on start
  set cherry to sprite of kind Food
  set cherry position to x pick random 0 to 160 y pick random 0 to 120
```

```
let cherry = sprites.create(img'', SpriteKind.Food)
cherry.setPosition(Math.randomRange(0, 160), Math.randomRange(0, 120))
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