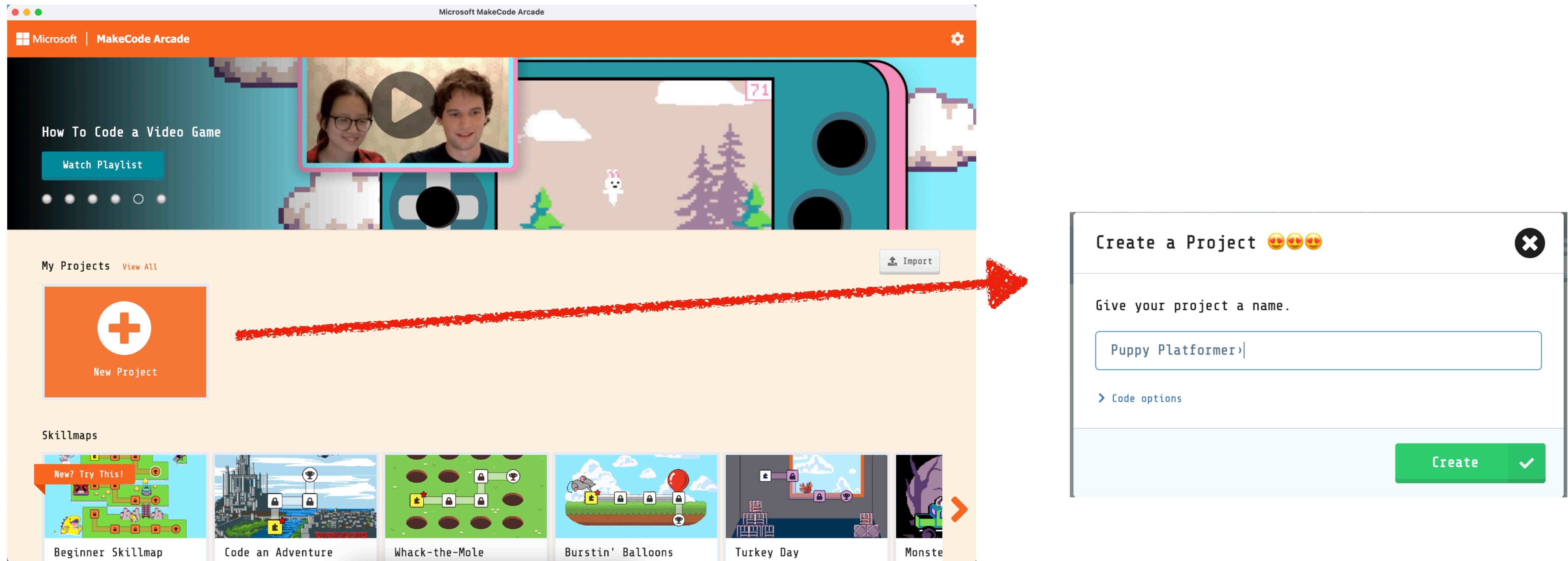


<https://shorturl.at/npsX2>

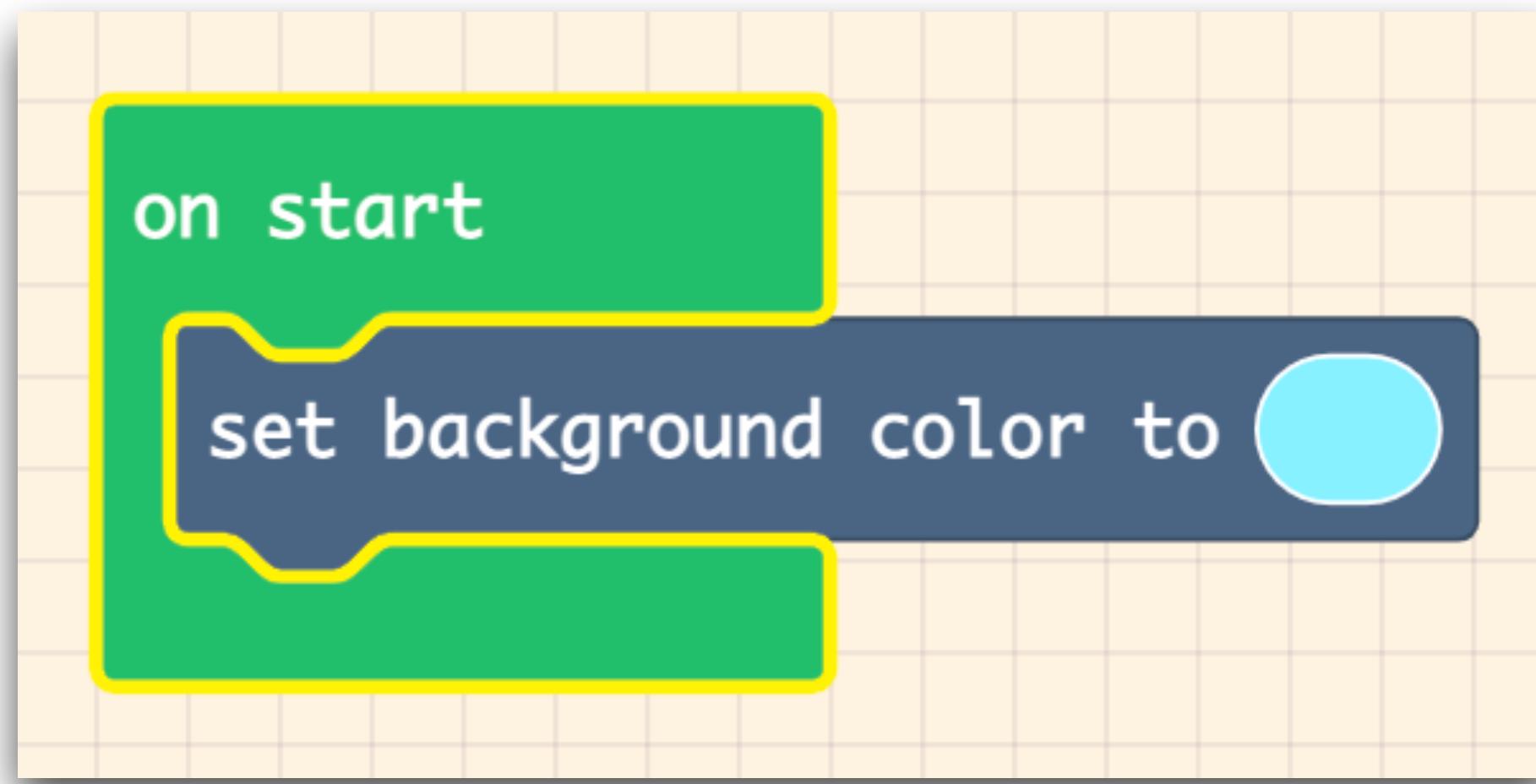
STEMLABS

Step 1: Create your Game



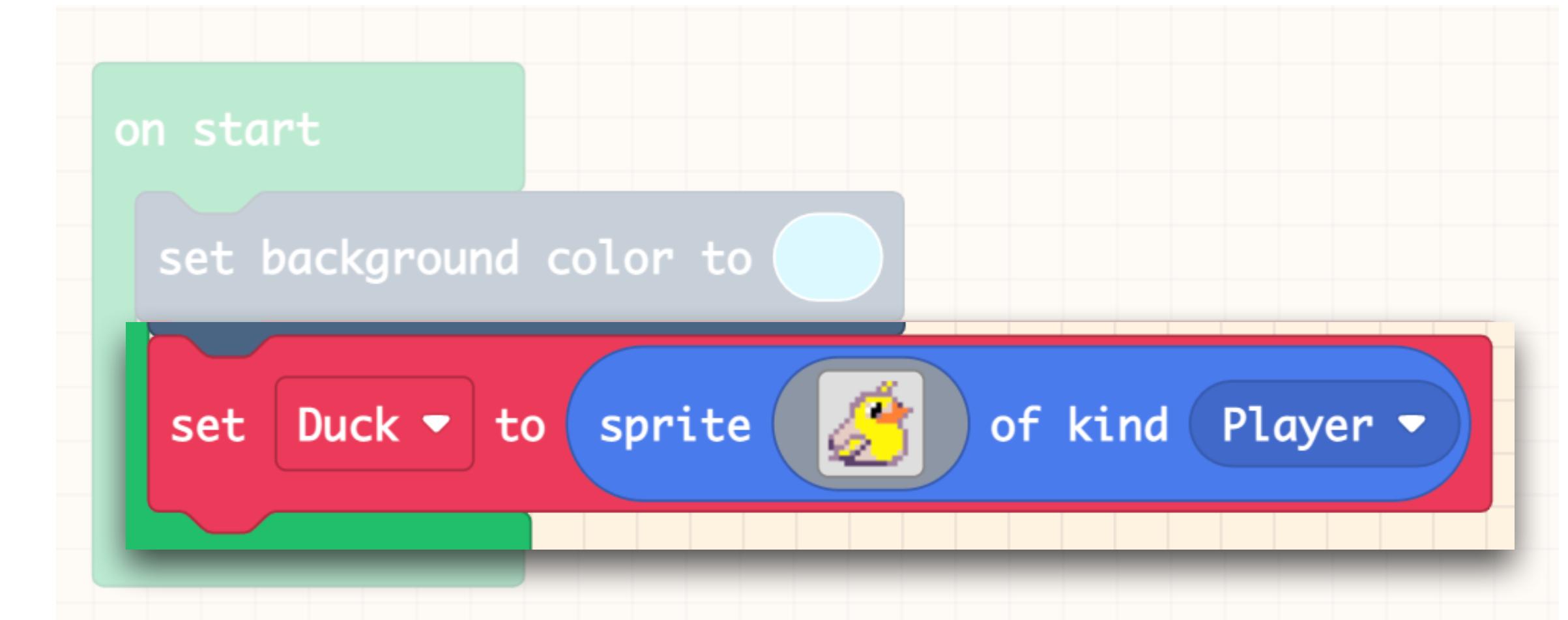
Click 'New Project' and give your project a name

Step 1: Create your Scene



1  Scene

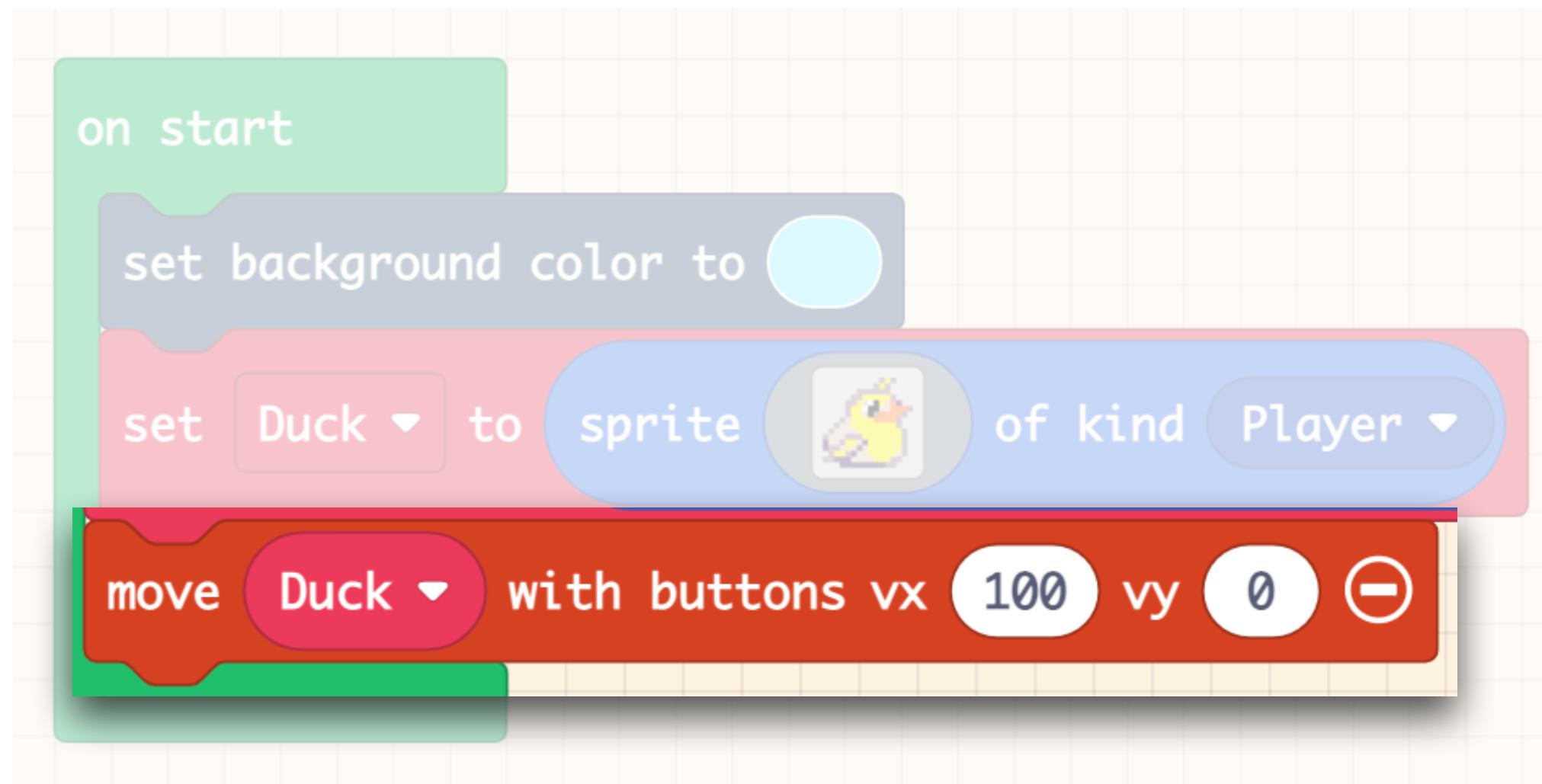
- Go to the Scene menu and select the code block above
- Create a blue background



2  Sprites

- Go to the Sprites menu and drag in the code block above
- Choose your favourite character or draw one!

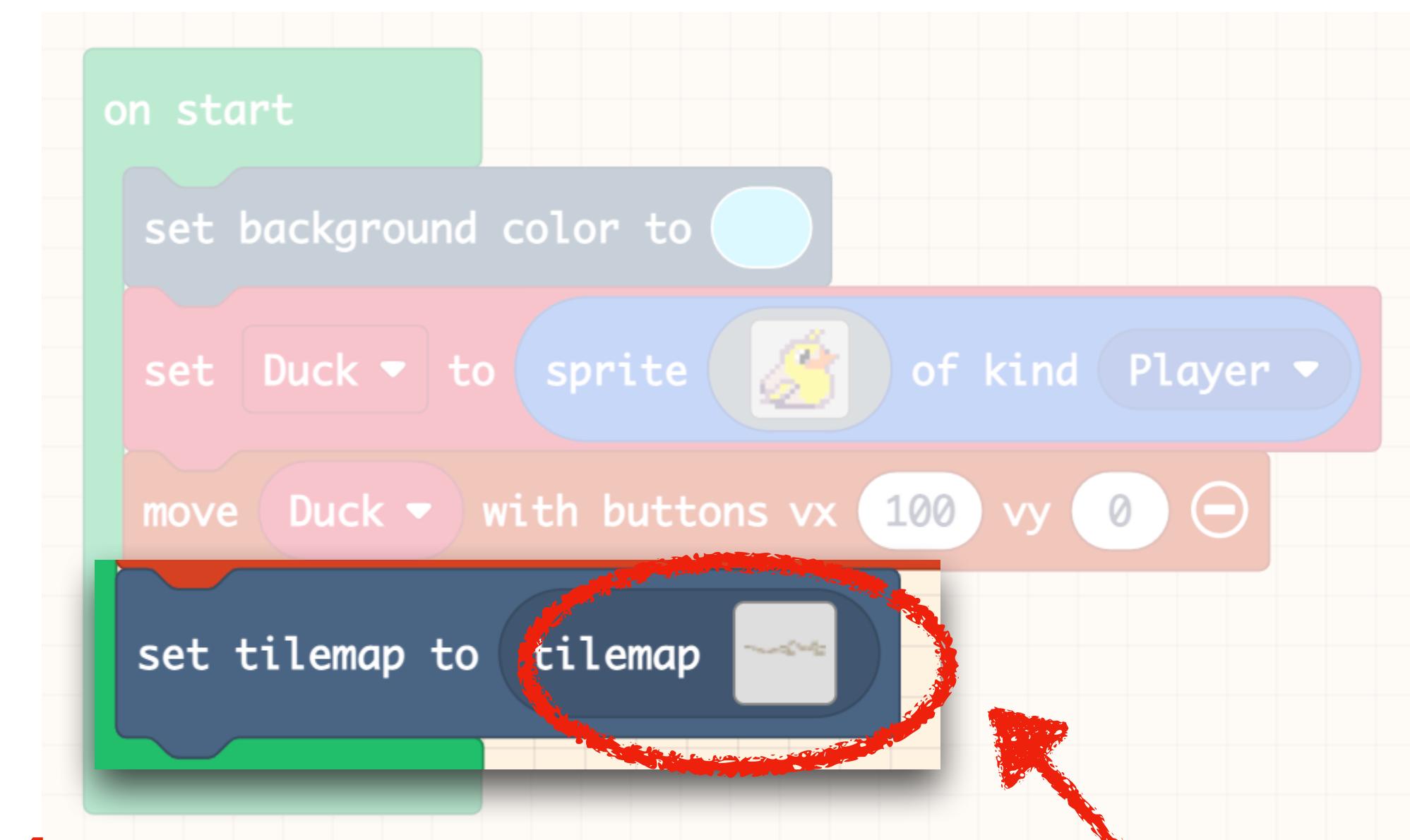
Step 1: Create your Scene



3

Controller

Drag in the code block above
to make your character move



4

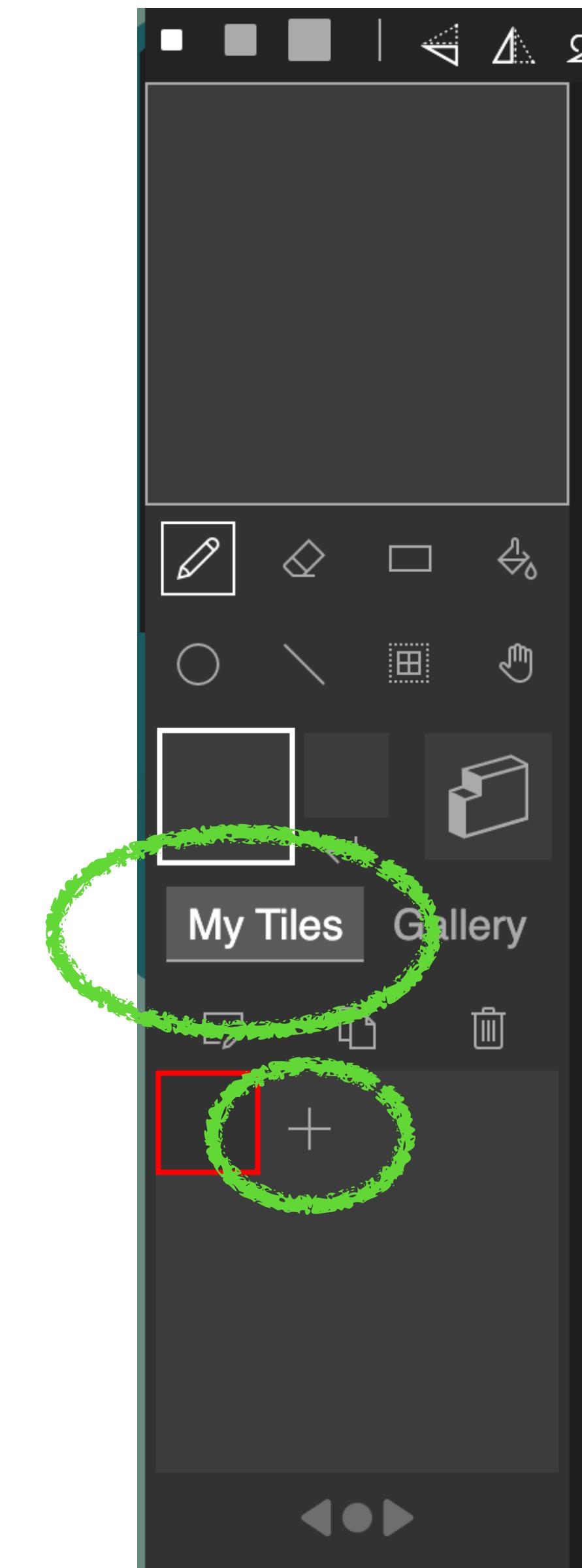
Scene

- Drag in the 'set tile map' code block
- Click on the grey tile

Step 1: Create your Scene

5

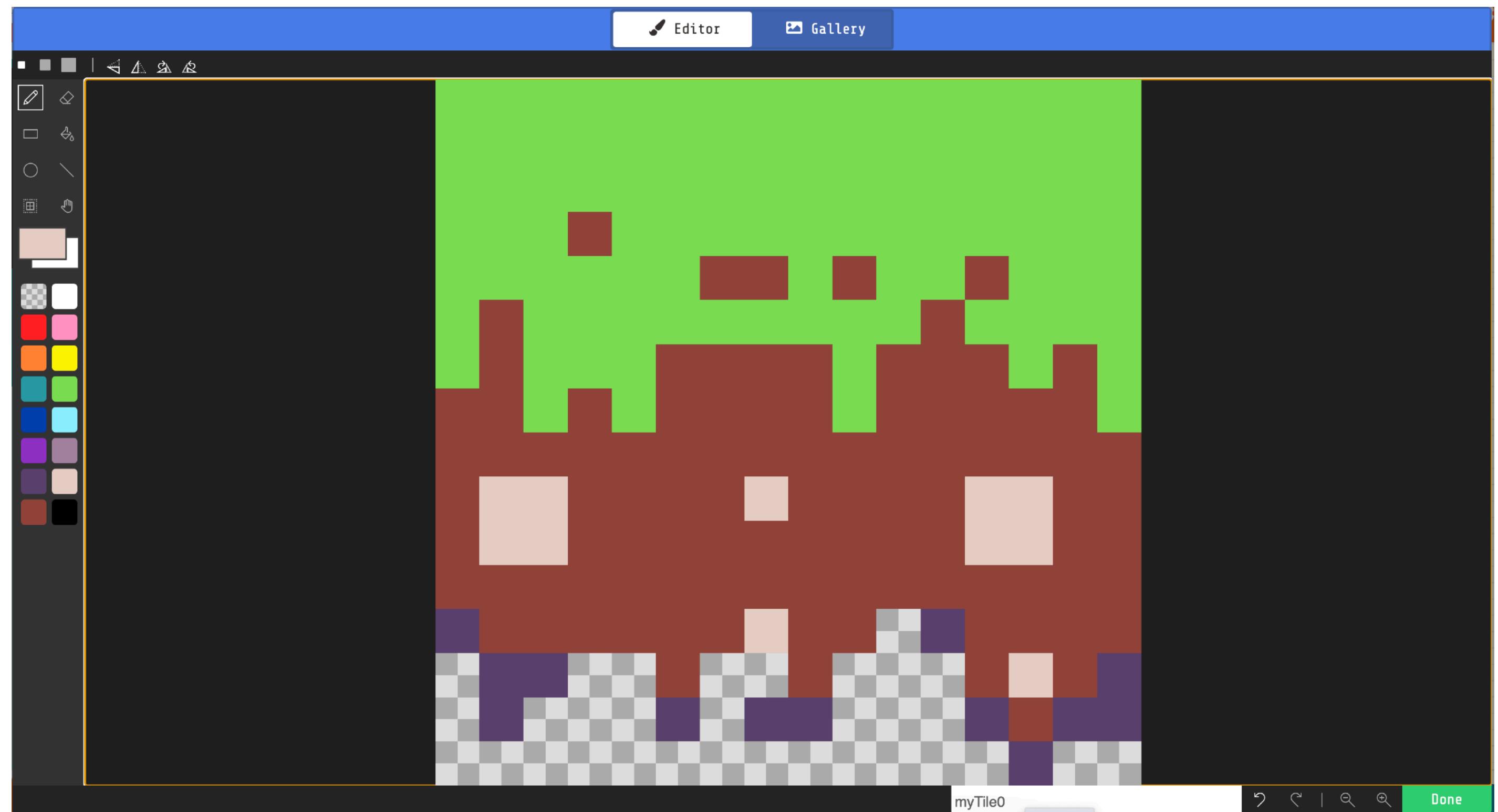
Click on 'My Tiles'



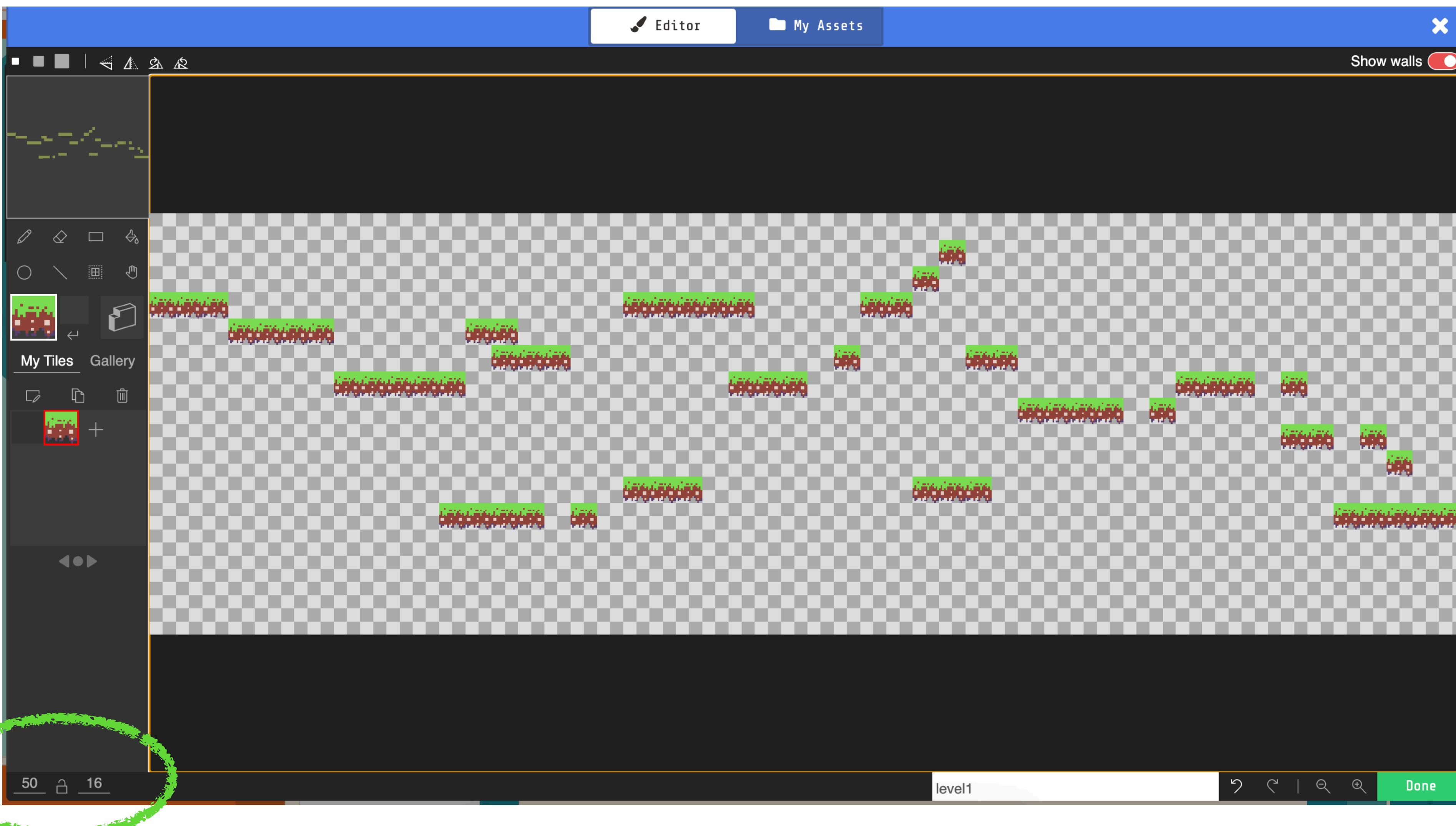
6

Click on the + icon

7 Create something like this to look like grass, dirt and stones
then click 'done'



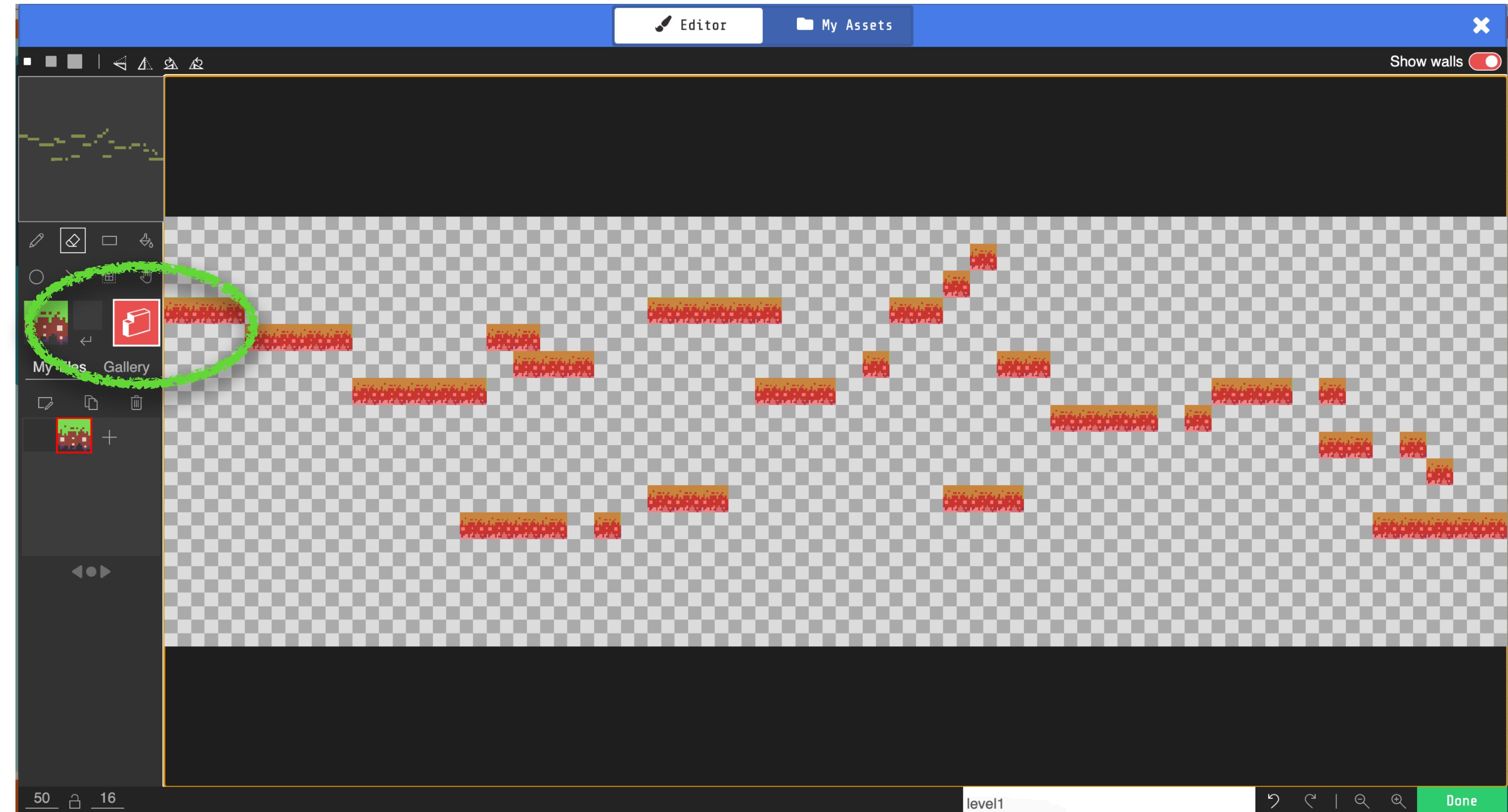
Step 1: Create your Scene



8

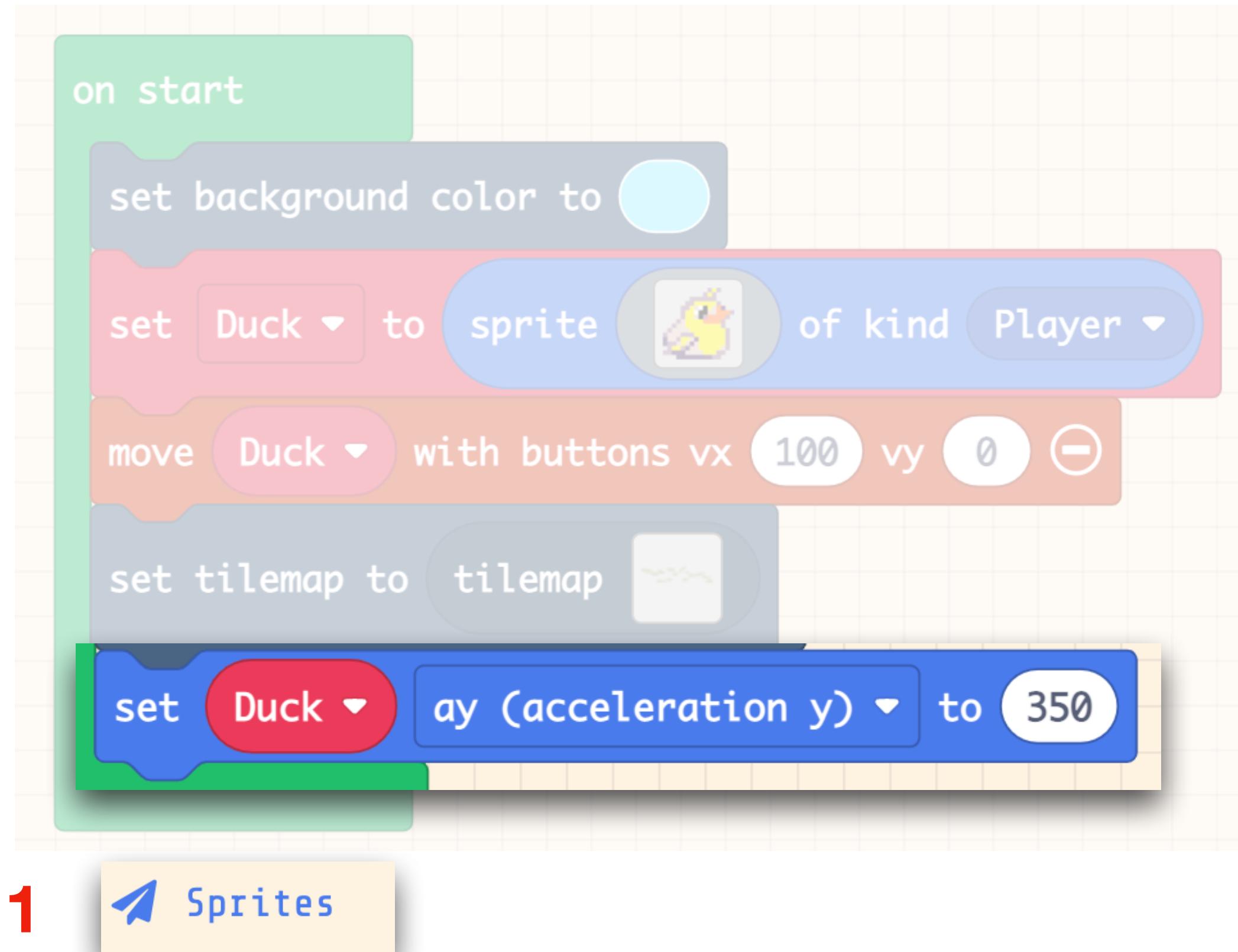
- Change the width of your platform to **50 x 16**
- Start drawing a few platforms

Step 1: Create your Scene - Make the walls solid!



- 9 - Click the Walls button and redraw over your platforms - this will make the walls solid so your Player doesn't fall through them!

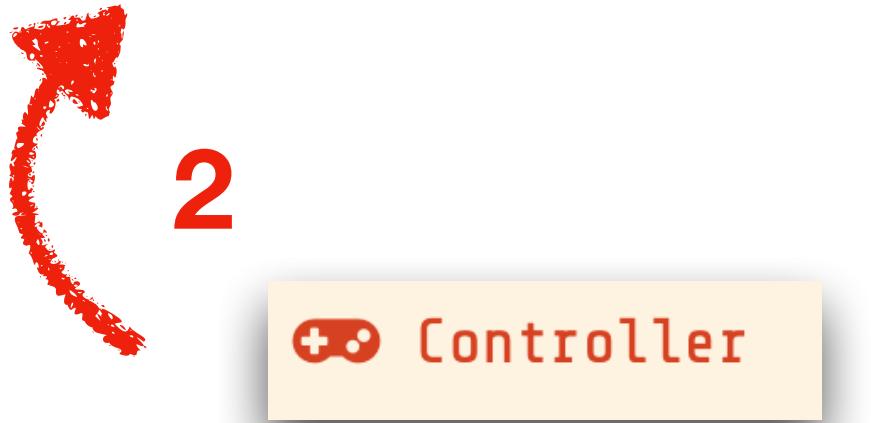
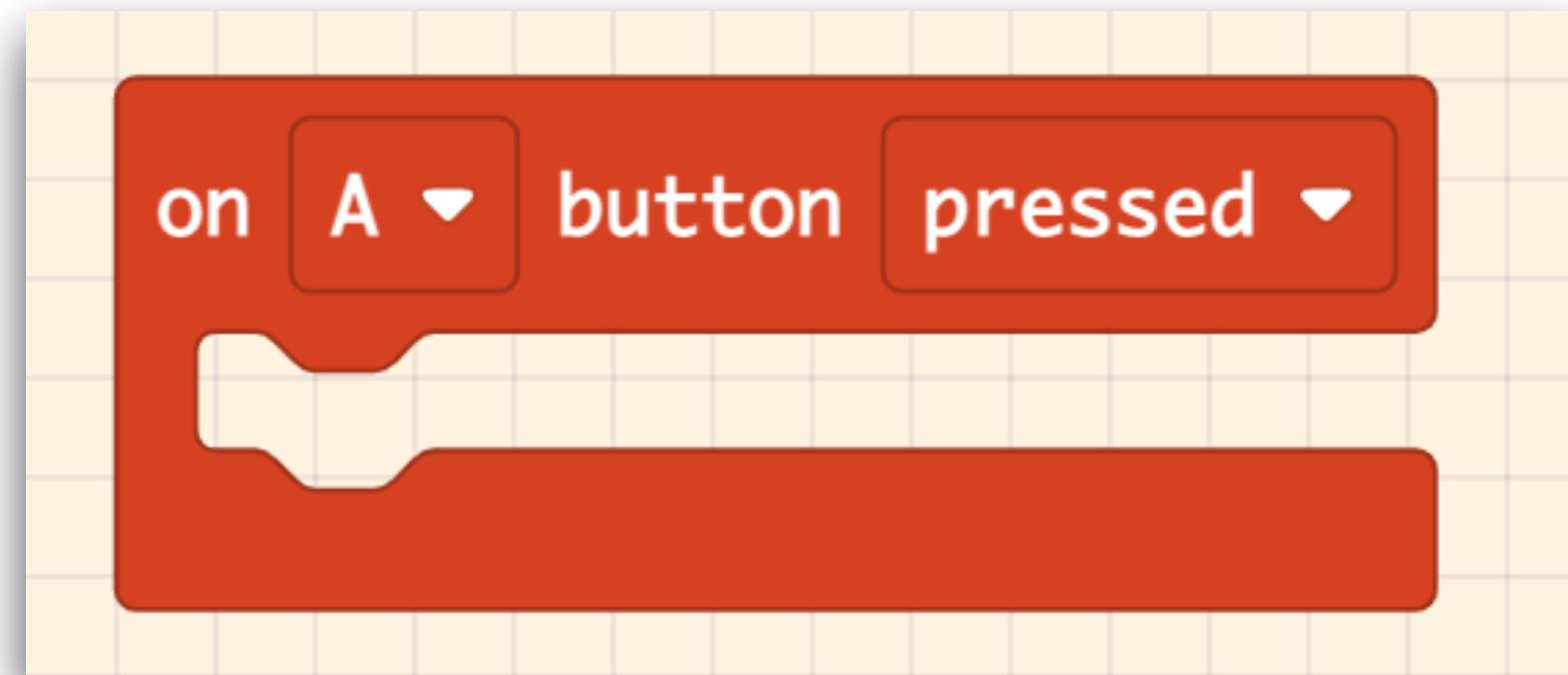
Step 2: Create Gravity and Jumps for your Player



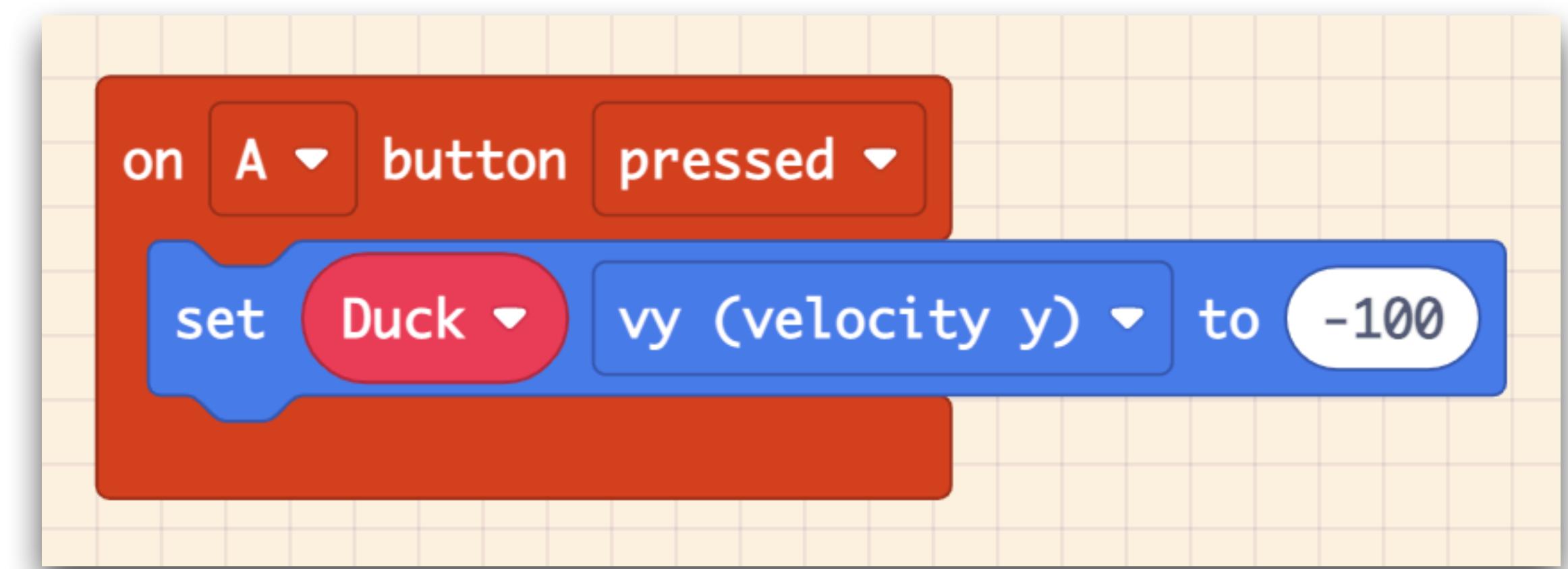
- Go to the Sprites menu and drag in this code block
- Set the acceleration to 350

This will make the Player fall, like gravity!

Step 2: Create Gravity and Jumps for your Player



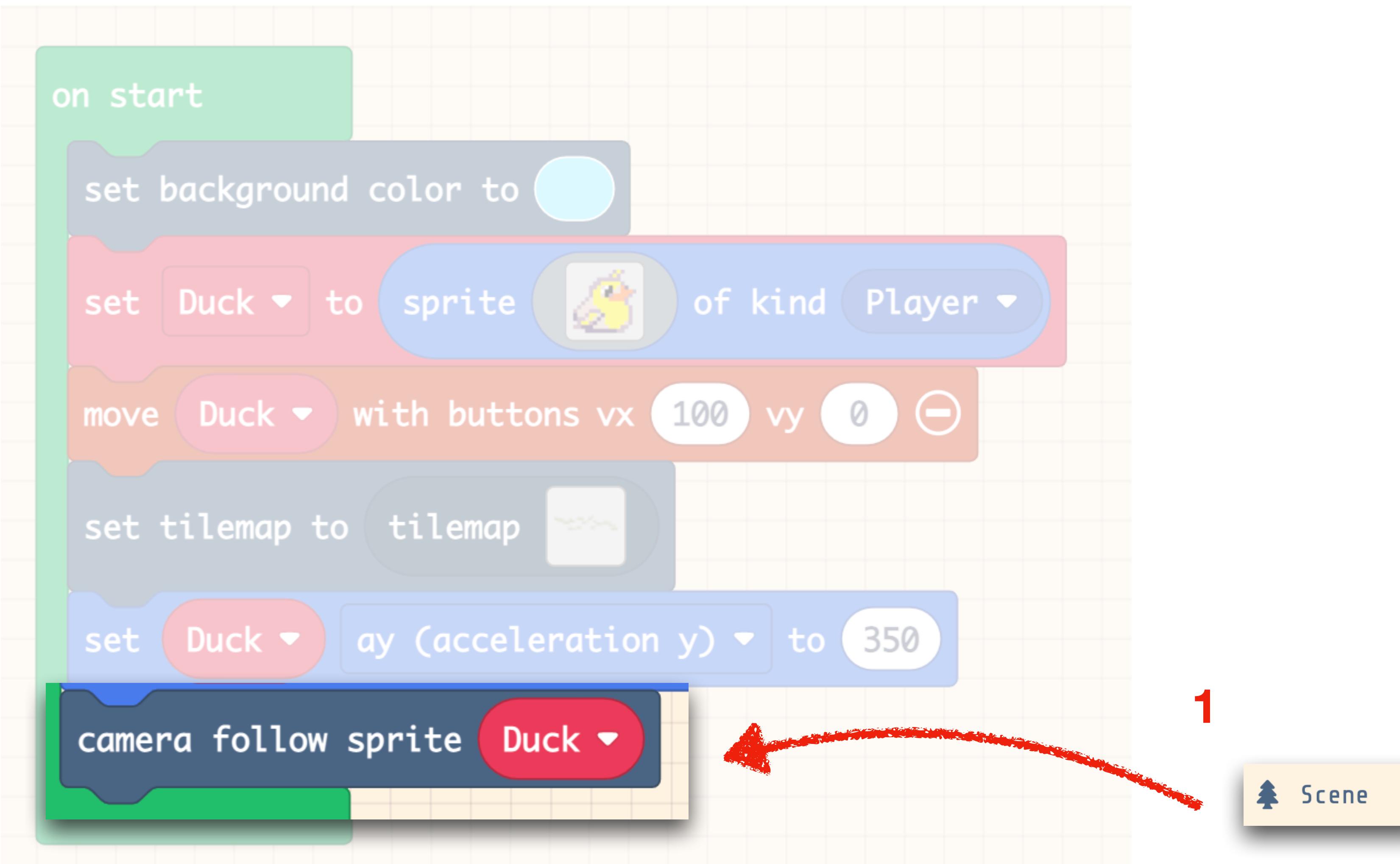
Go to the Controller menu and drag in this code block



- Go to the Sprites menu and drag in this code block
- Set the vy velocity to -100

This will make the Player jump when you hit the space bar

Step 3: Make the Camera follow the sprite along your platform



- Go to the Scene menu and drag in this code block

Step 4: Make it more complex - Stop your Player from being able to jump jump jump!

1

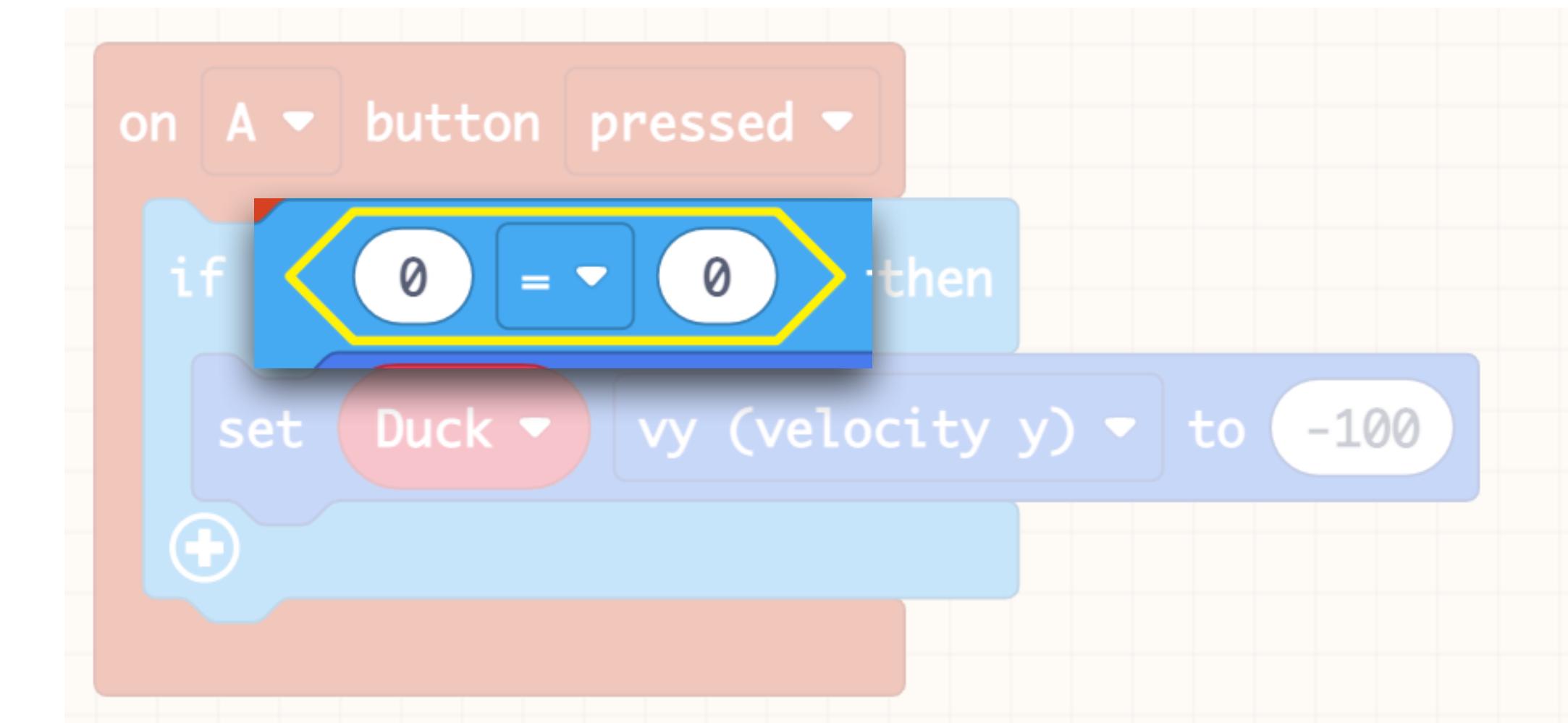
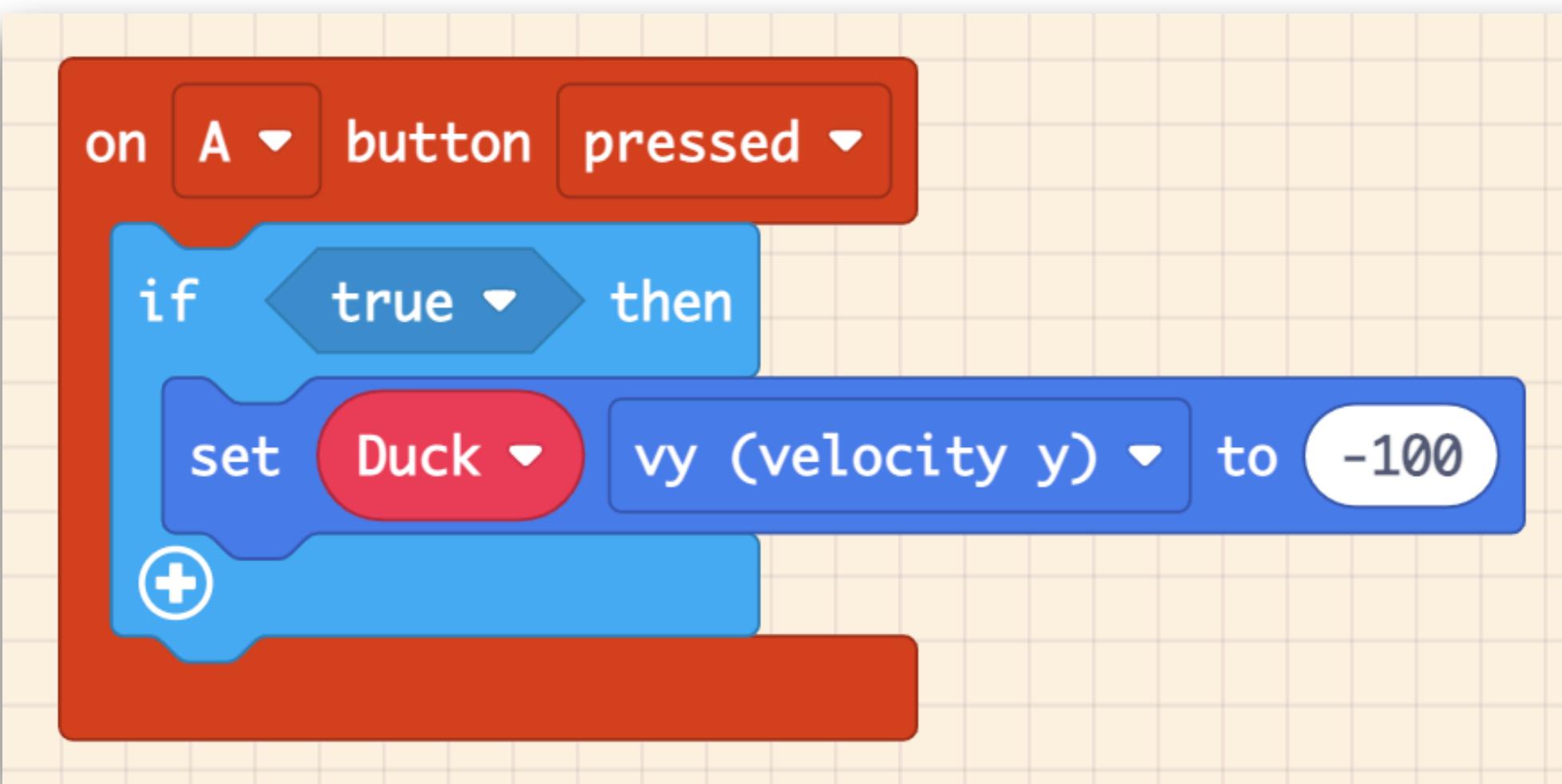


- Go to the Logic menu and drag in an IF TRUE THEN block
- Wrap it around the vy velocity block

2



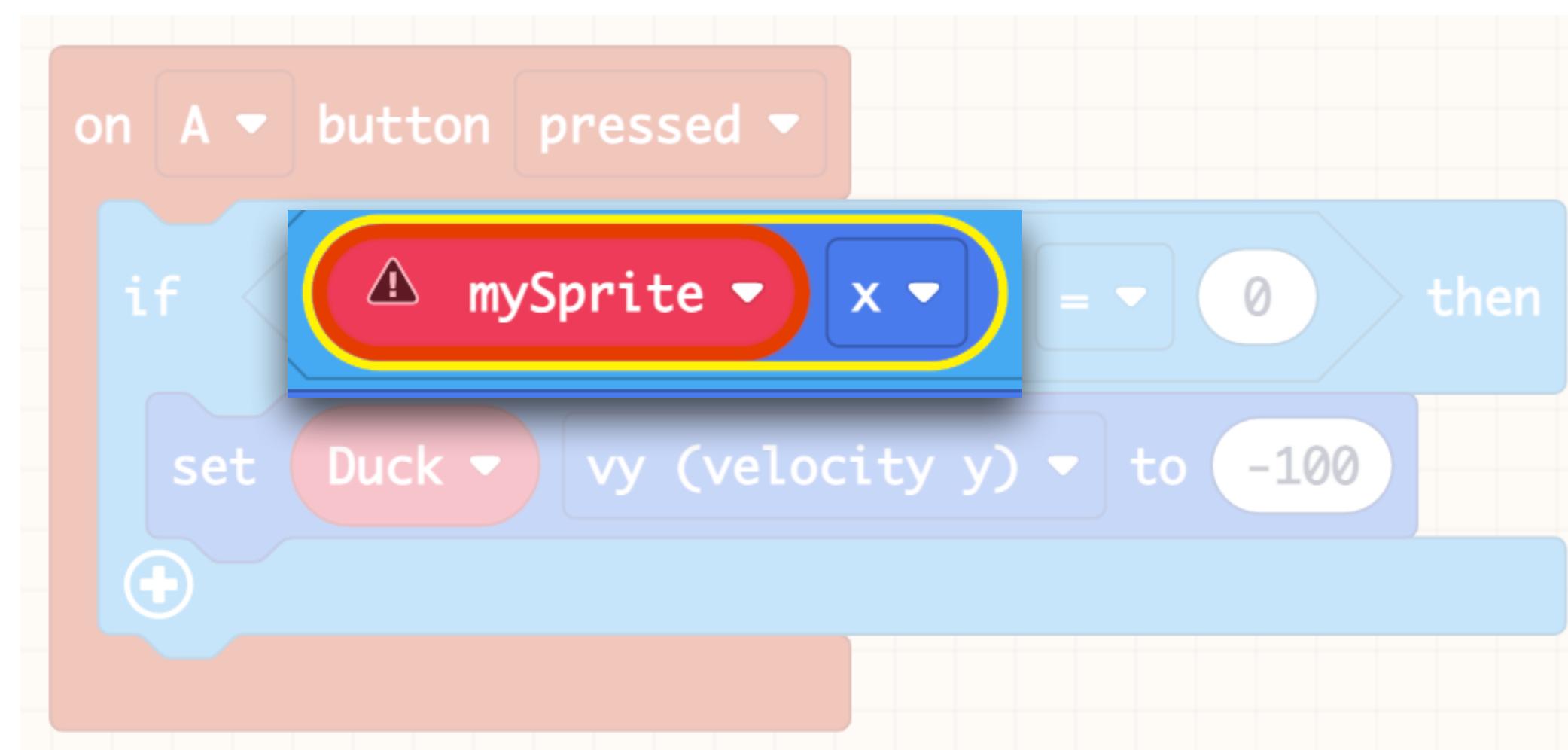
- Go to the Logic menu and drag the block below
- Drop it into the section that said 'true'



Step 4: Make it more complex - Stop your Player from being able to jump jump jump!

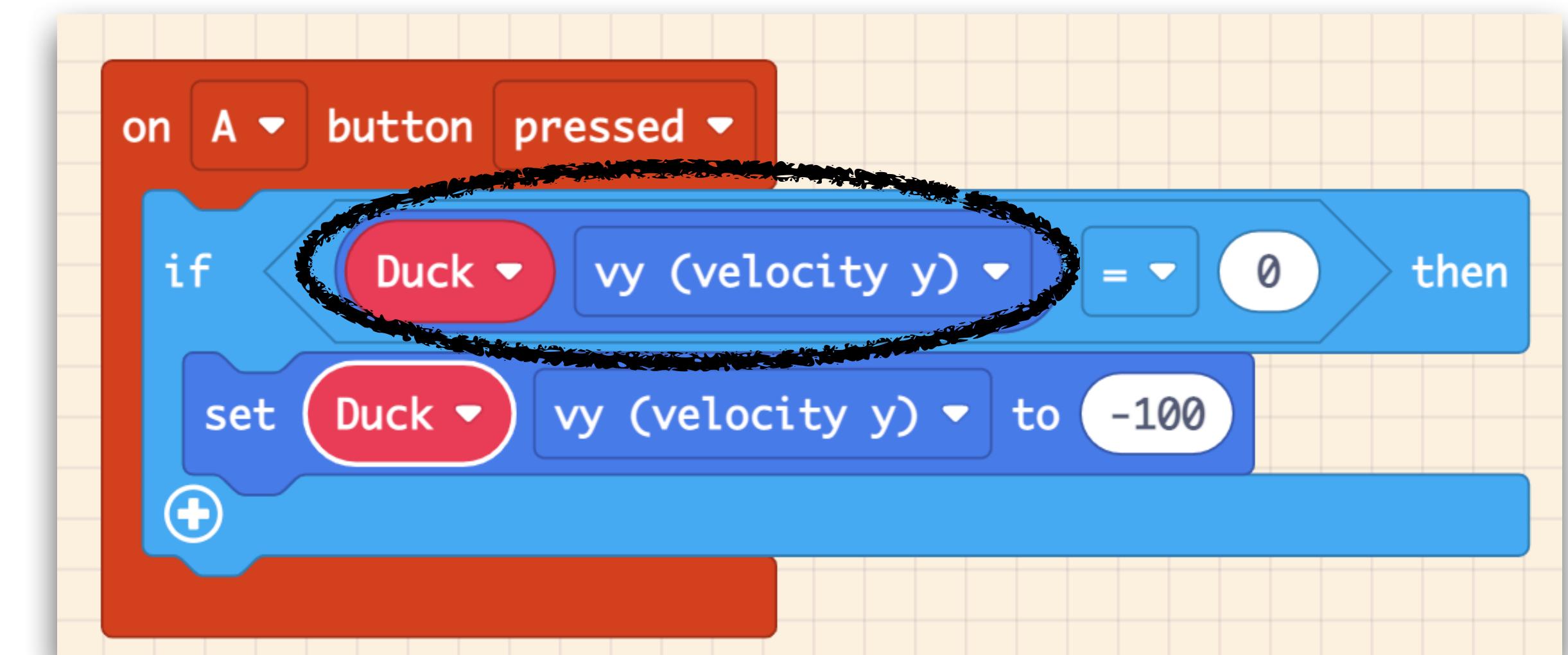
3 Sprites

- Go to the Sprites menu and drag in this block
- Drop it into the first **0**



4

- Change the red block to what your player is called
- Change the **x** to **vy (velocity y)**



TEST YOUR GAME!

- Your player should not be able to double jump or jump when they are falling
- You should be able to move around your platform from start to finish
- You might need to go back into your **tile map** and edit the platforms
- You might need to edit your **jump velocity** (page 9)

Your code should look like this

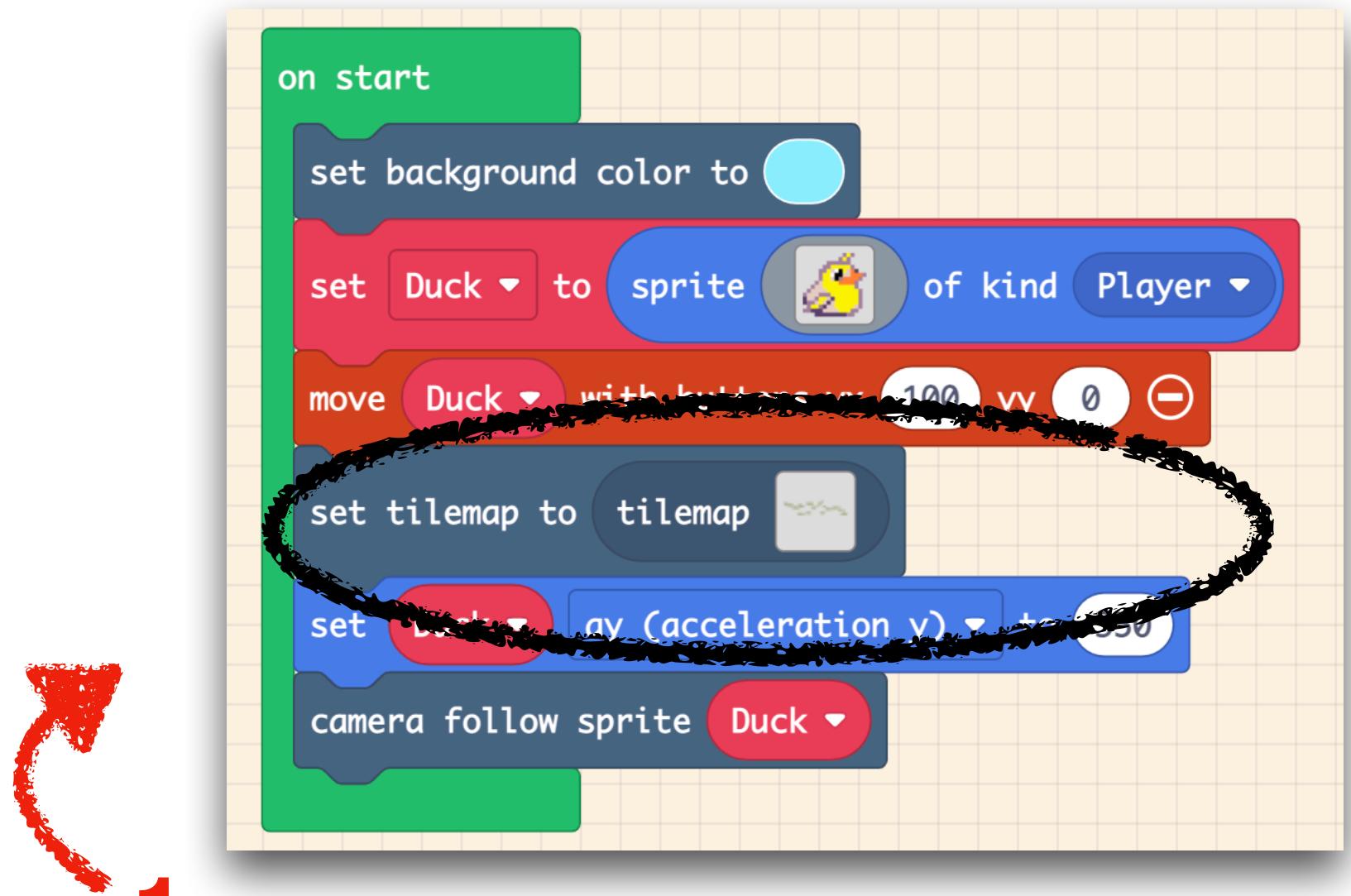
This Scratch script starts with an **on start** event. It sets the background color to light blue, sets the player sprite to a yellow duck, moves the duck with button inputs, sets the tilemap to "tilemap" (which contains a wavy path), and sets the duck's acceleration to 350. Finally, it uses the camera follow sprite block to track the duck.

```
on start
  set background color to [light blue v]
  set [Duck v] to [sprite v] of kind [Player v]
  move [Duck v] with buttons vx [100] vy [0] - [ ]
  set tilemap to [tilemap v]
  set [Duck v] ay [acceleration y v] to [350]
  camera follow sprite [Duck v]
```

This Scratch script adds a jump feature. It checks if the A button is pressed. If it is, it checks if the duck's current velocity y is 0. If so, it sets the duck's velocity y to -100, which makes the duck jump upwards.

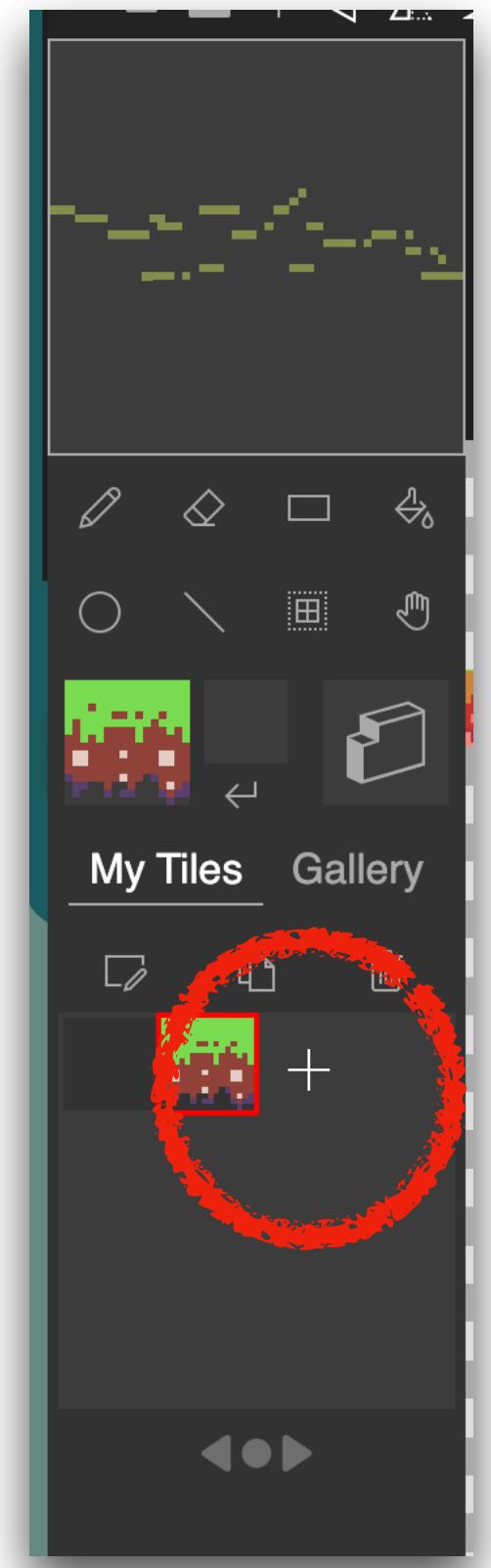
```
on [A v] button pressed
  if [Duck v] vy [velocity y v] = [0] then
    set [Duck v] vy [velocity y v] to [-100]
```

Step 5: End the Game if you fall!



1

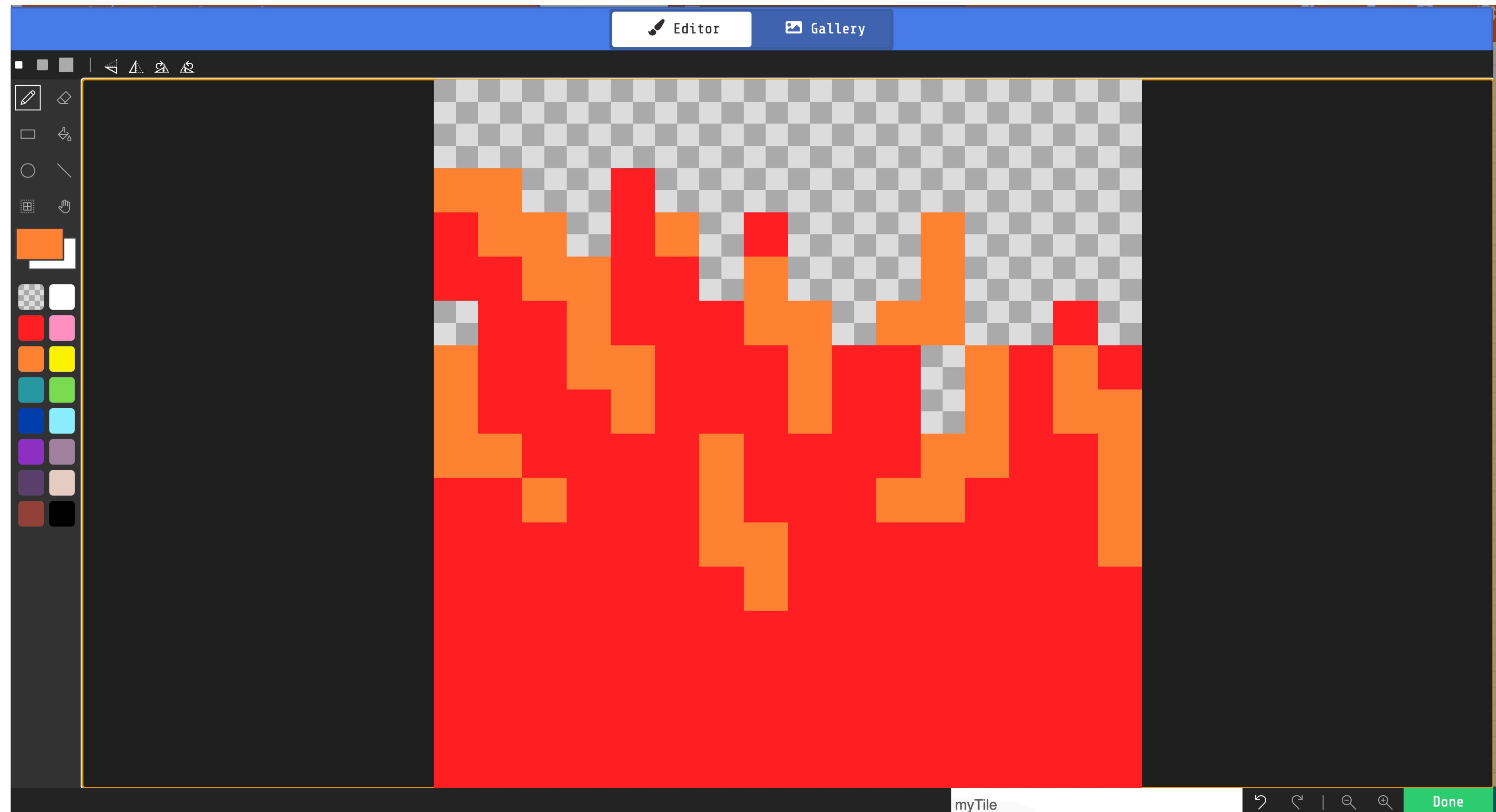
Click on the grey Tile Map box



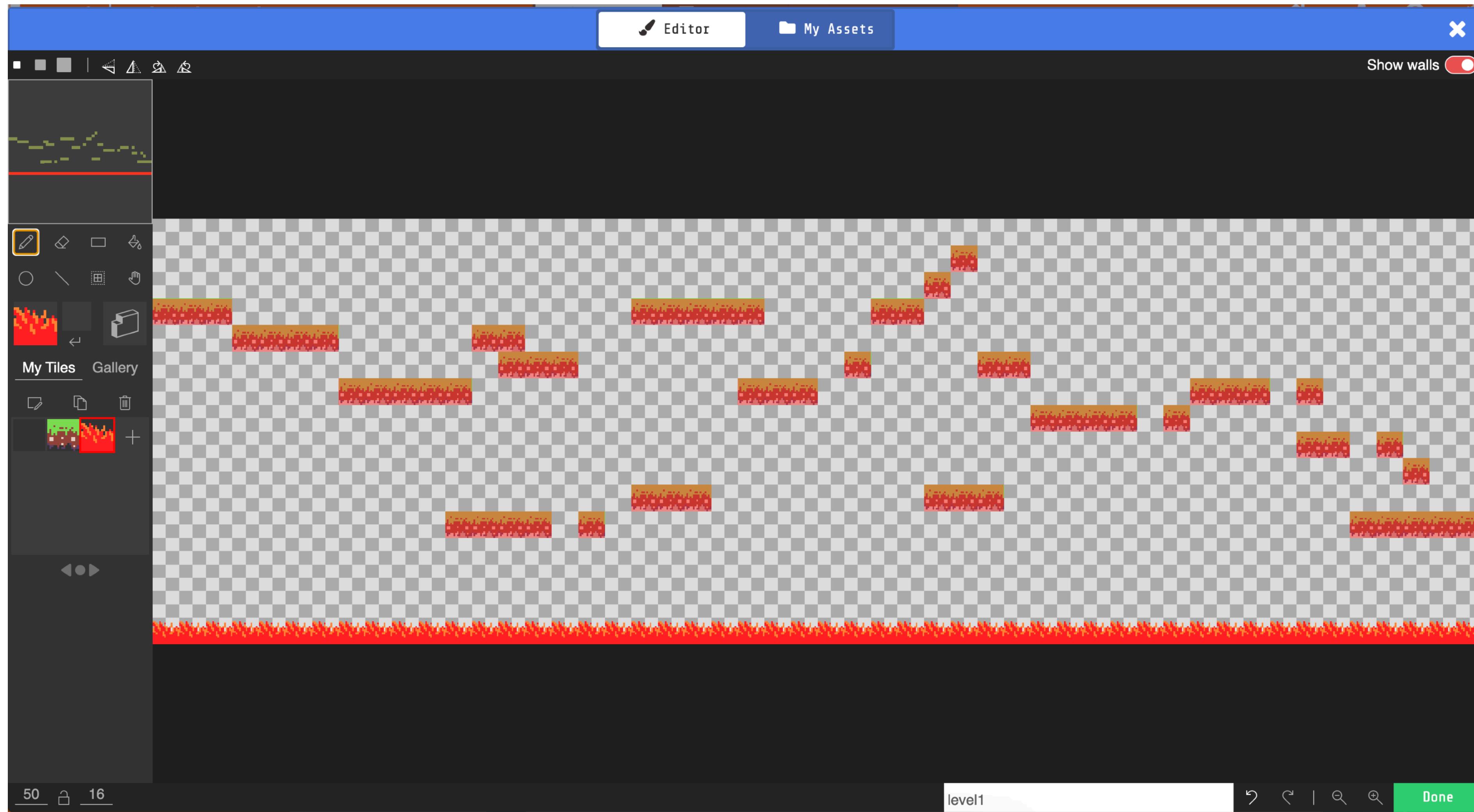
2

Click the + icon then make some red and orange Lava!!

Step 5: End the Game if you fall!



Step 5: End the Game if you fall!



Run the lava along the bottom of the screen

Step 5: End the Game if you fall!

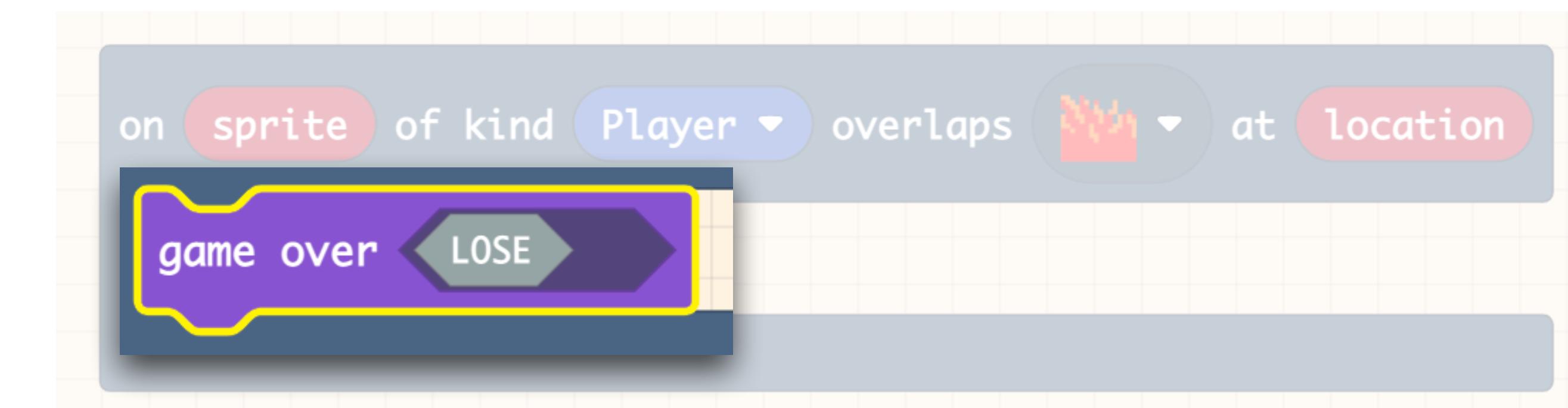


5 Scene

- Go to the Scene menu and drag in this code block
- Select your lava tile

6 Game

Go to the Game menu and drag in this block - set to **lose**

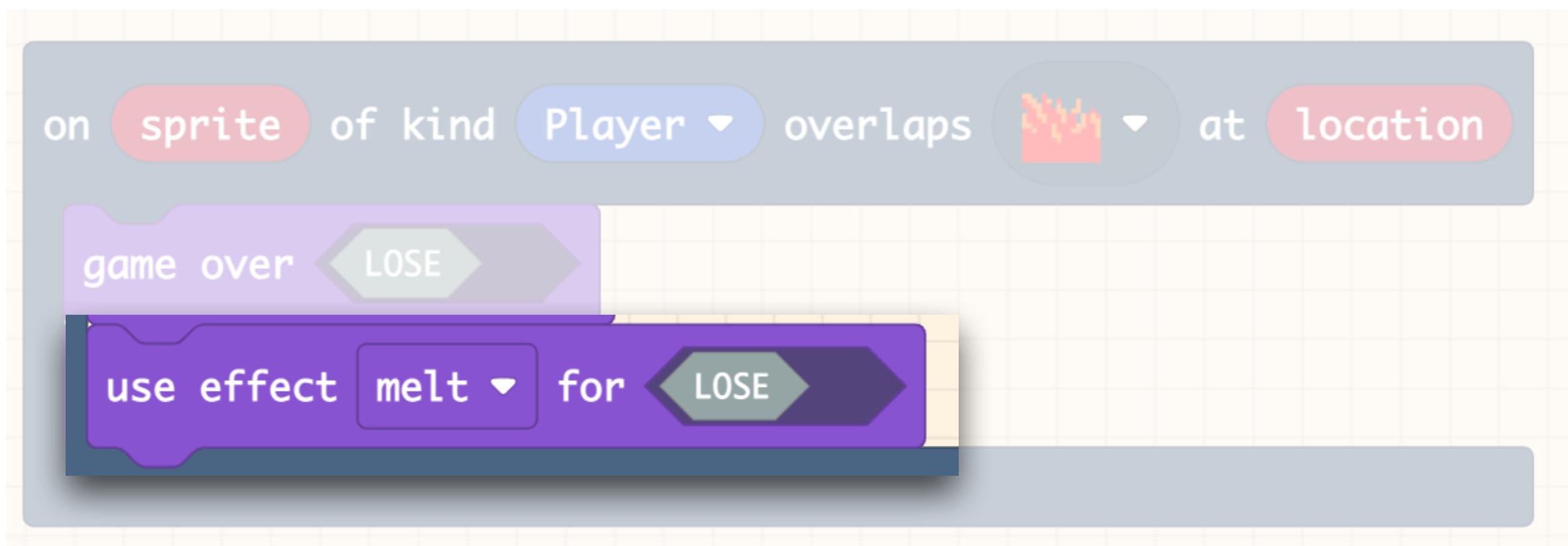


Step 5: End the Game if you fall!

7



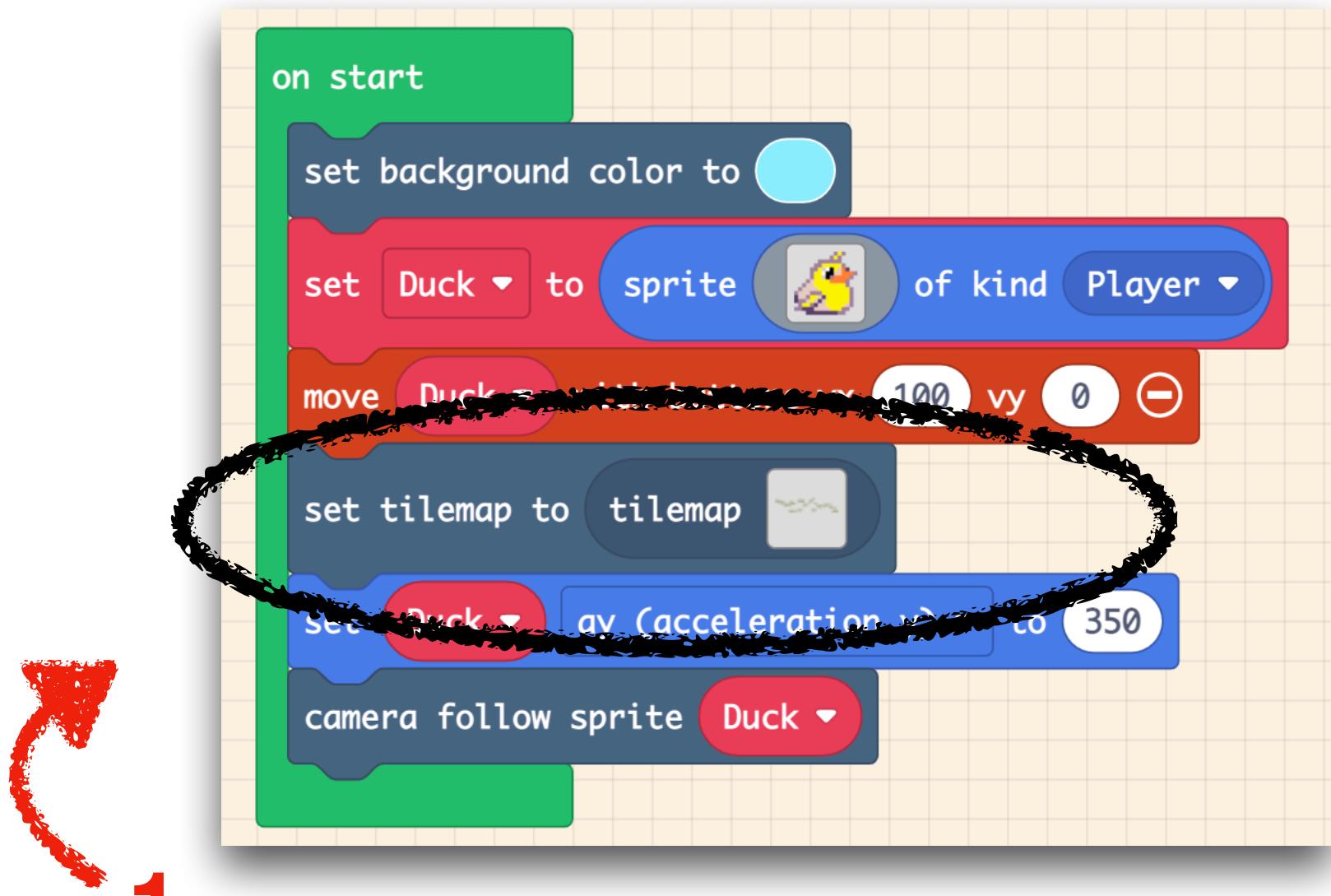
Go to the Game menu and drag in this block - set to **melt effect if lose**



TEST YOUR GAME!

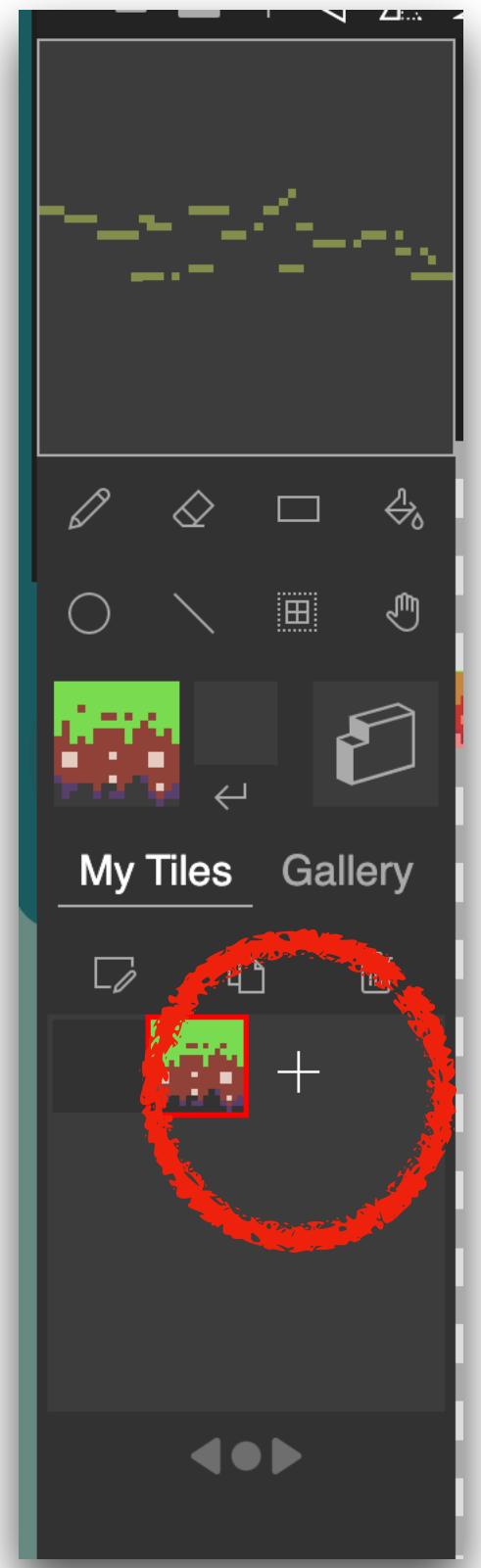
- If your Player falls and touches the lava the game should end
- You should see a pop up saying ‘Game Over’

Step 6: Win the Game if you reach the Portal!



1

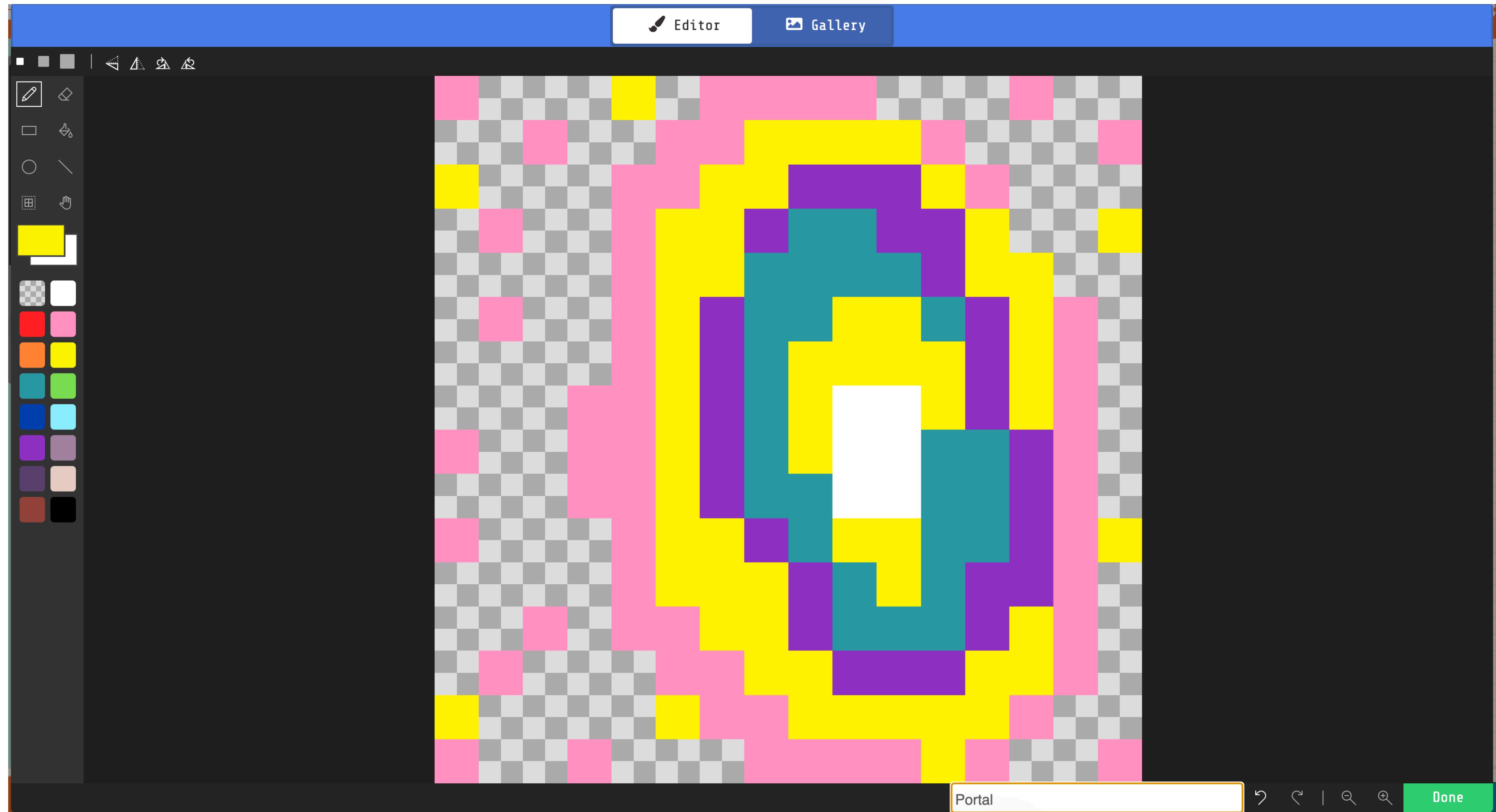
Click on the grey Tile Map box



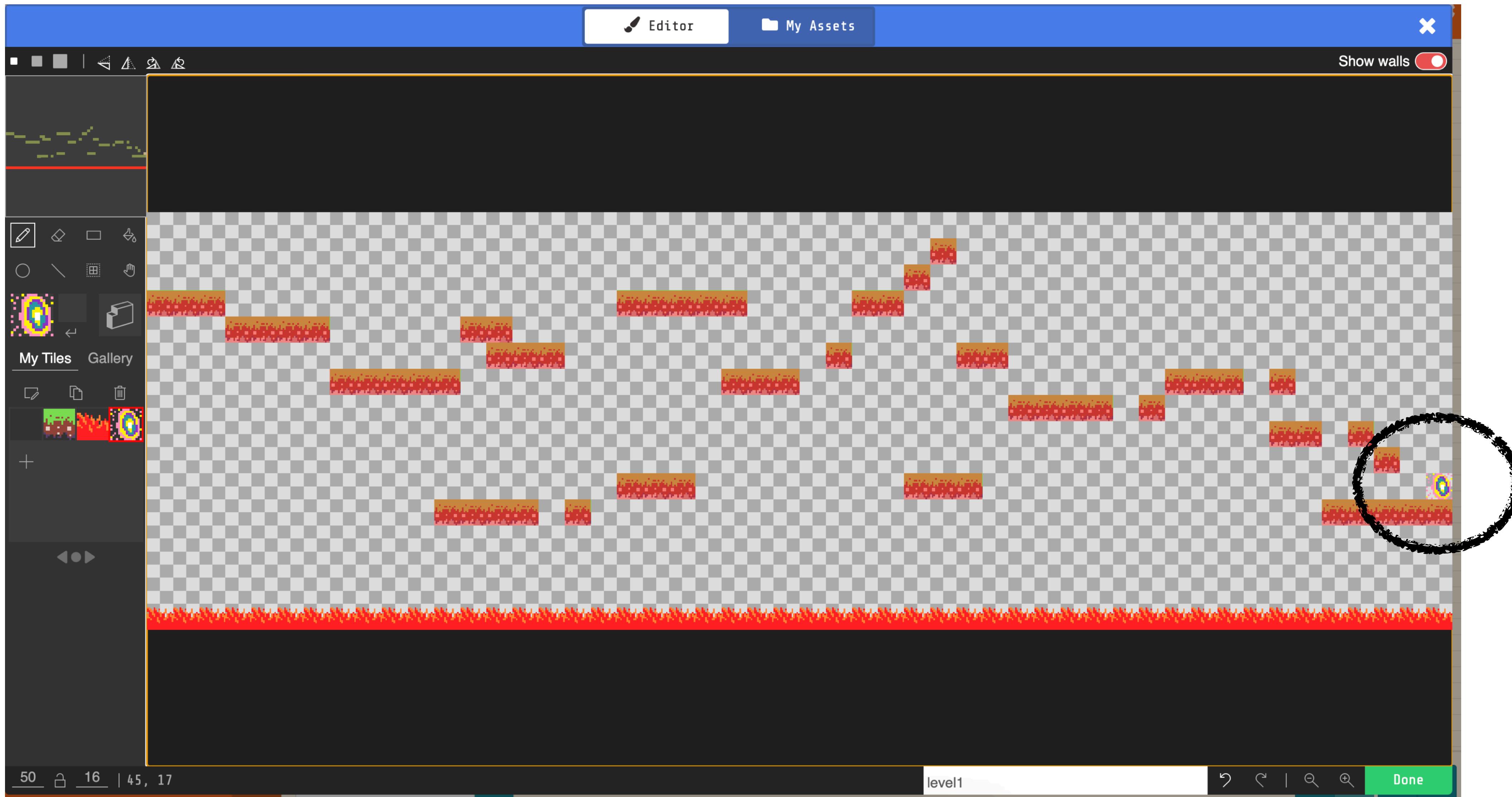
2

Click the + icon then make a Portal!

Step 6: Win the Game if you reach the Portal!



Step 6: Win the Game if you reach the Portal!



Position your Portal towards the end of your game

Step 6: Win the Game if you reach the Portal!



5 Scene

- Go to the Scene menu and drag in this code block
- Select your Portal tile

6 Game

Go to the Game menu and drag in this block - set to **win**

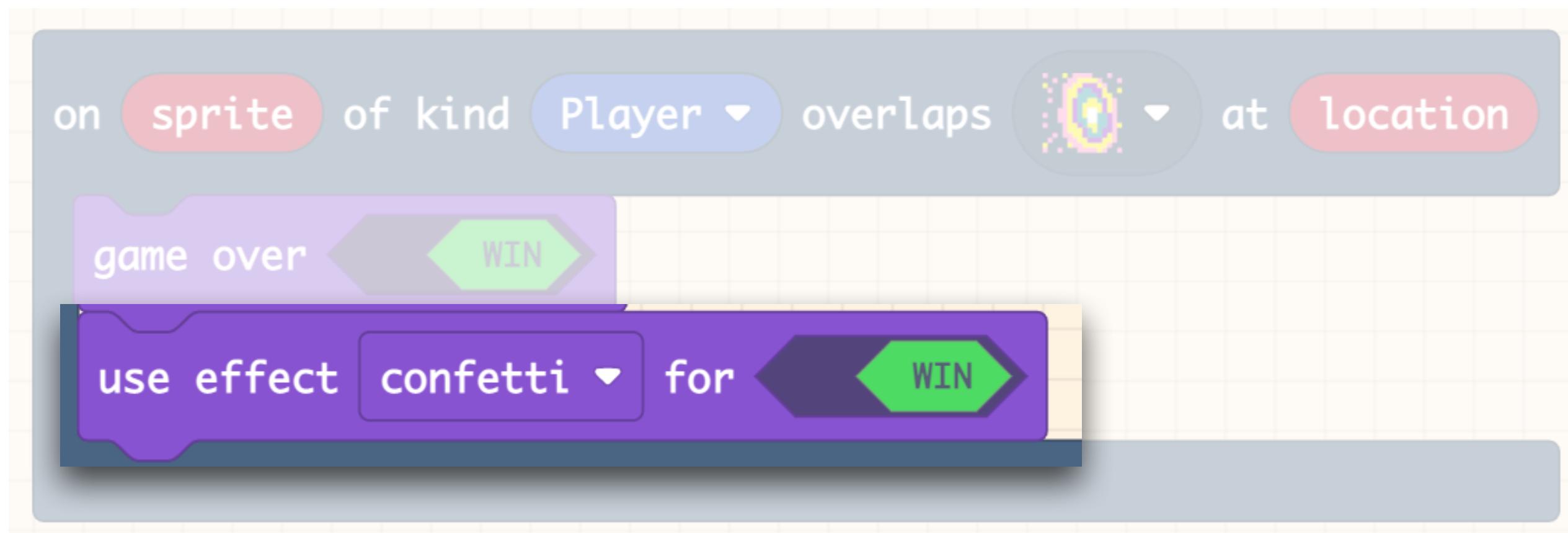


Step 6: Win the Game if you reach the Portal!

7



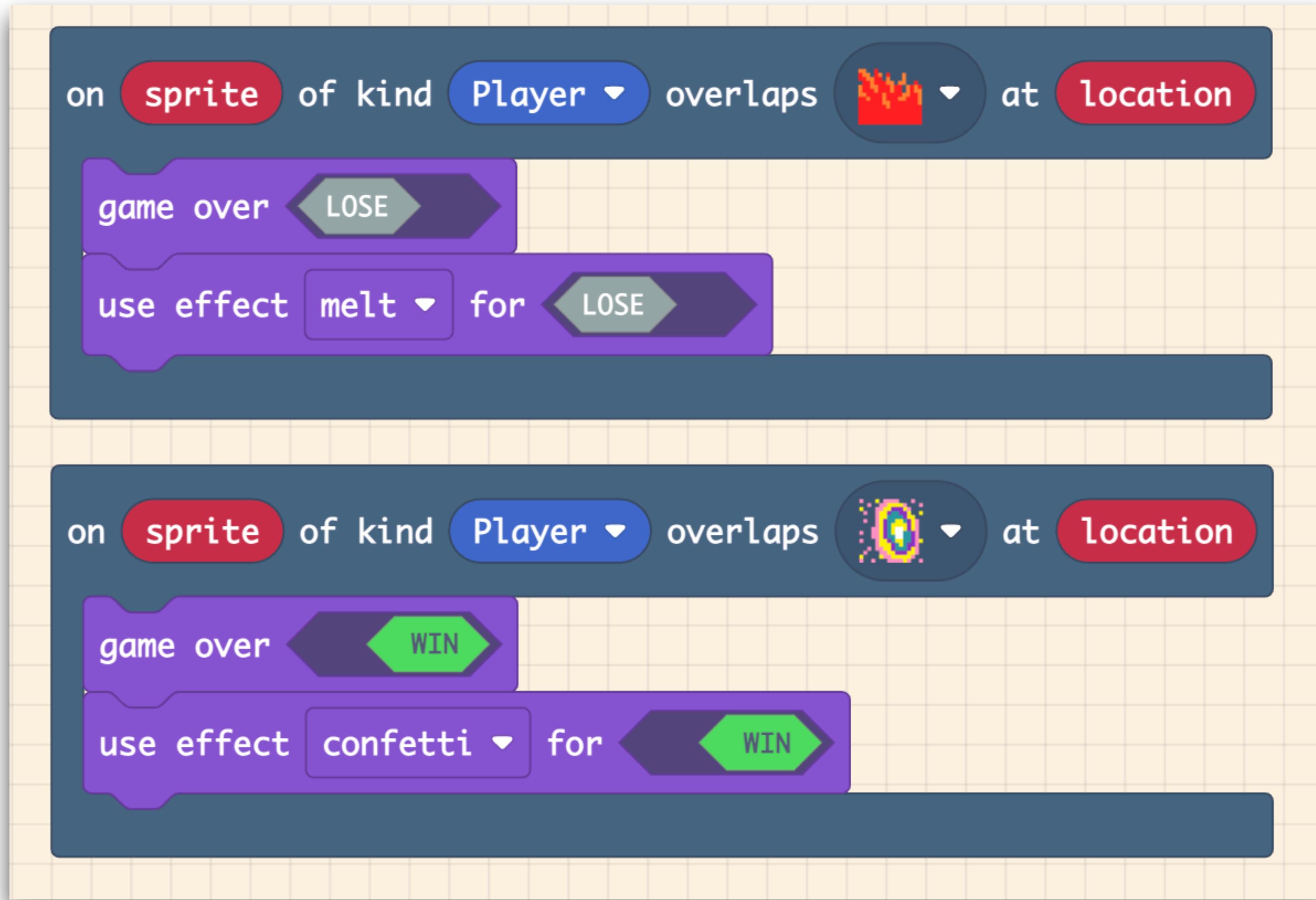
Go to the Game menu and drag in this block - set to **confetti effect** if win



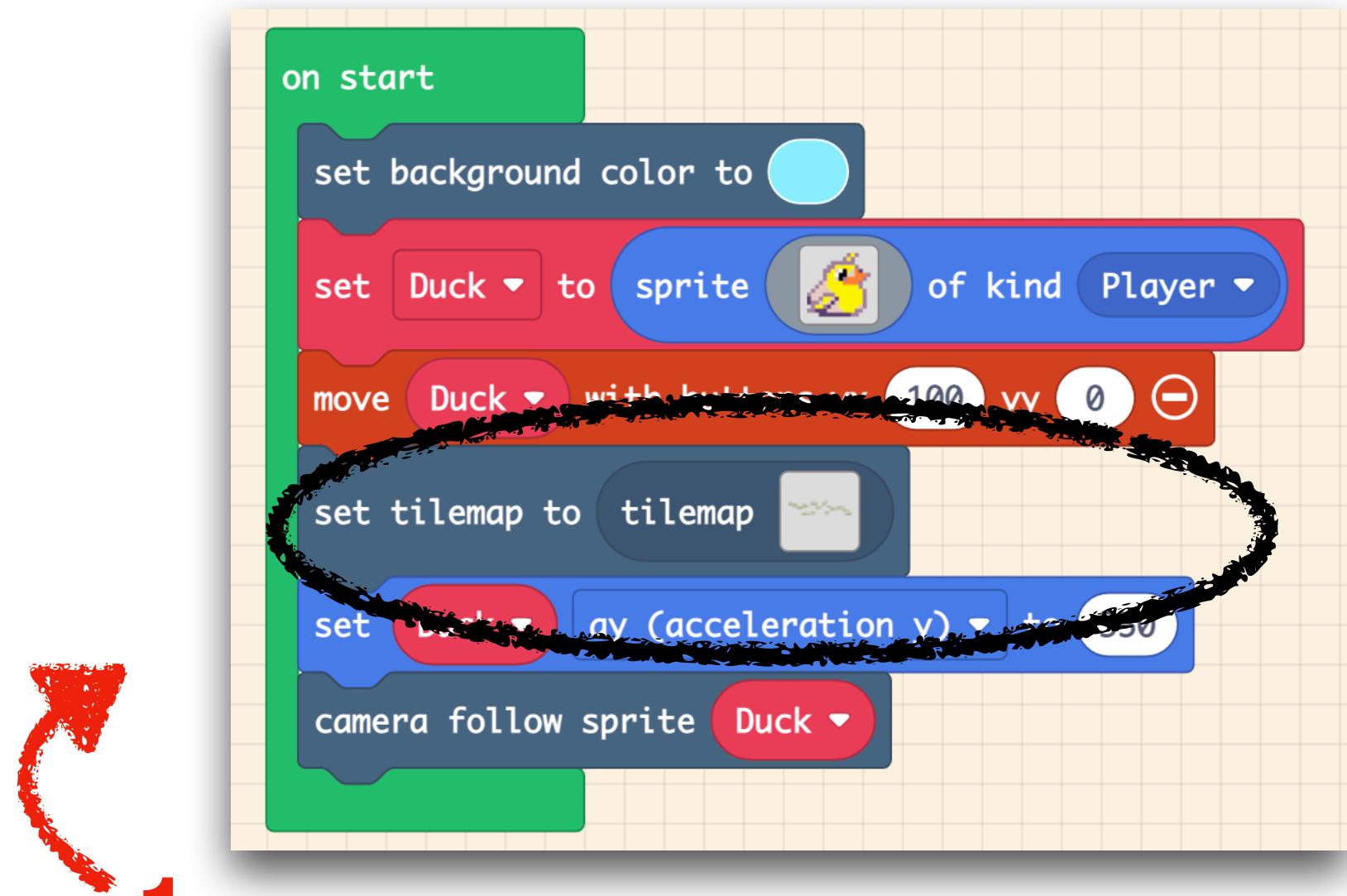
TEST YOUR GAME!

- If your Player reaches the portal the game should end
- You should see a pop up saying ‘You Win!’

Your code should look like this

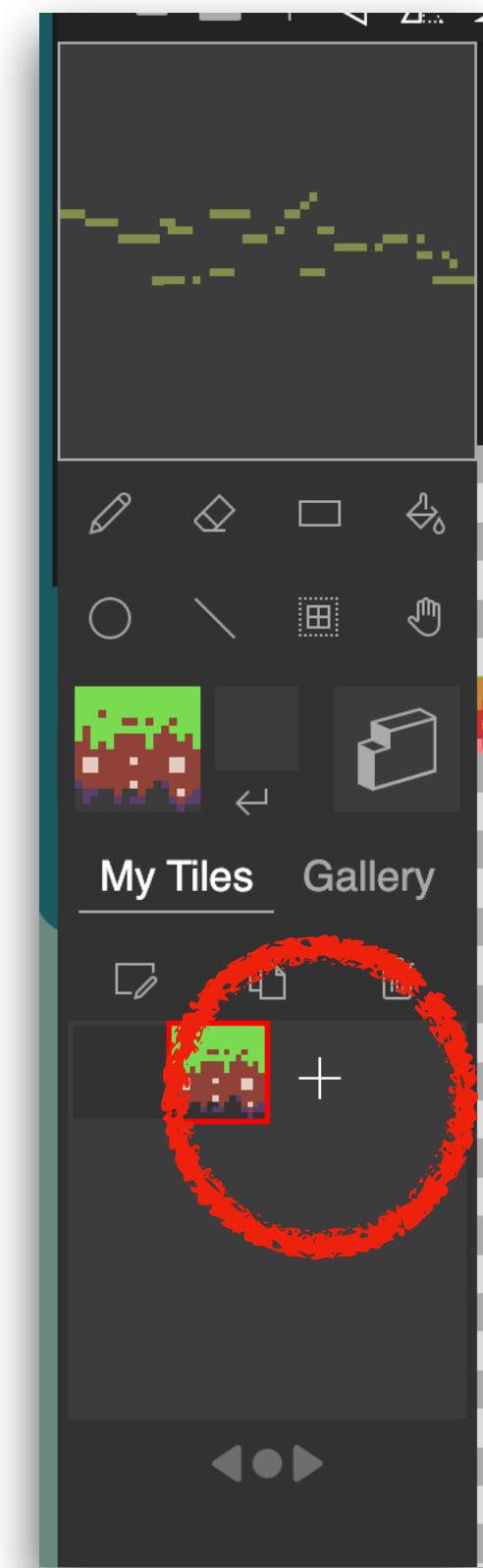


Step 7: Spawning Tiles to make Coins



1

Click on the grey Tile Map box

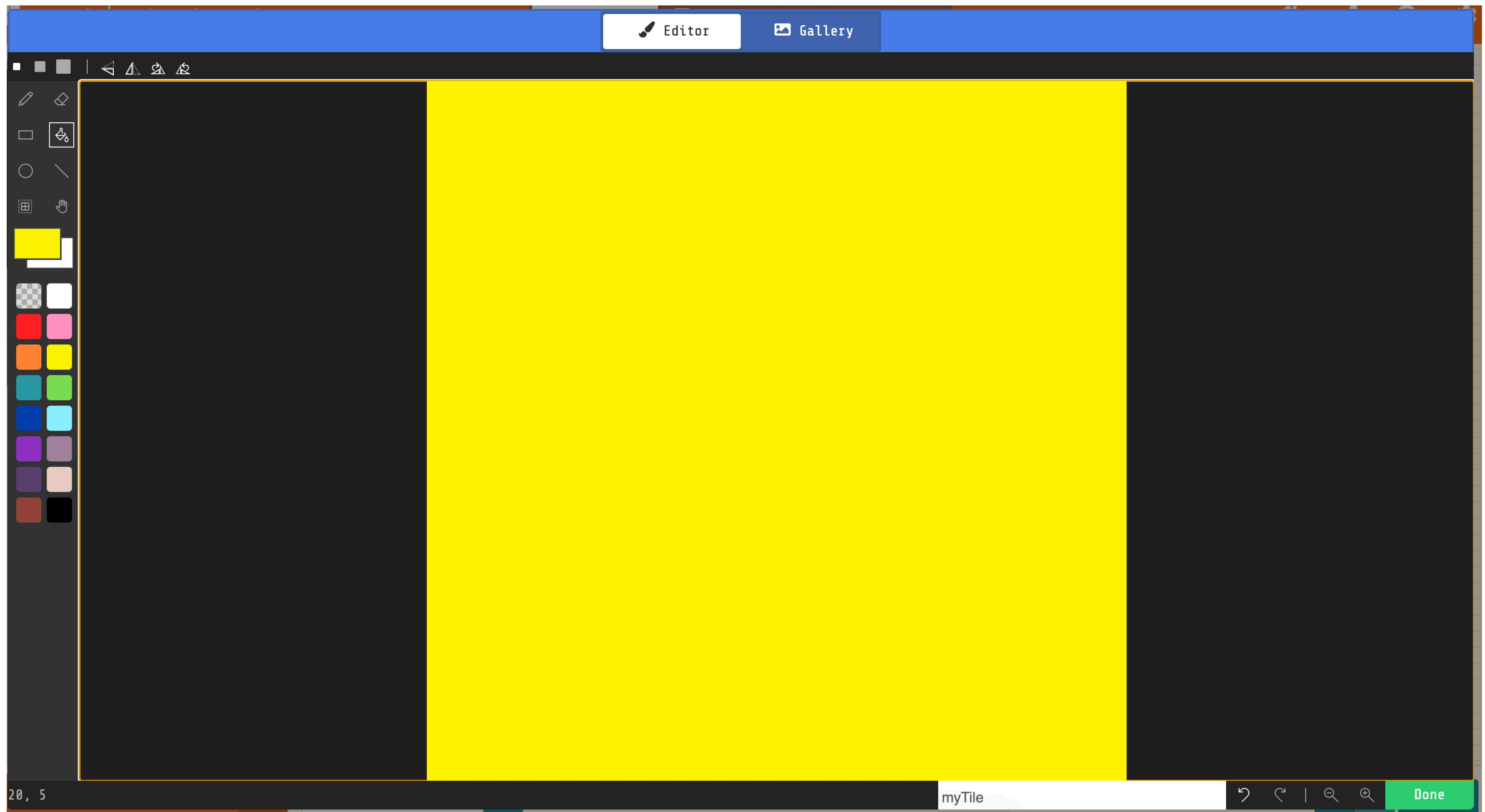


2

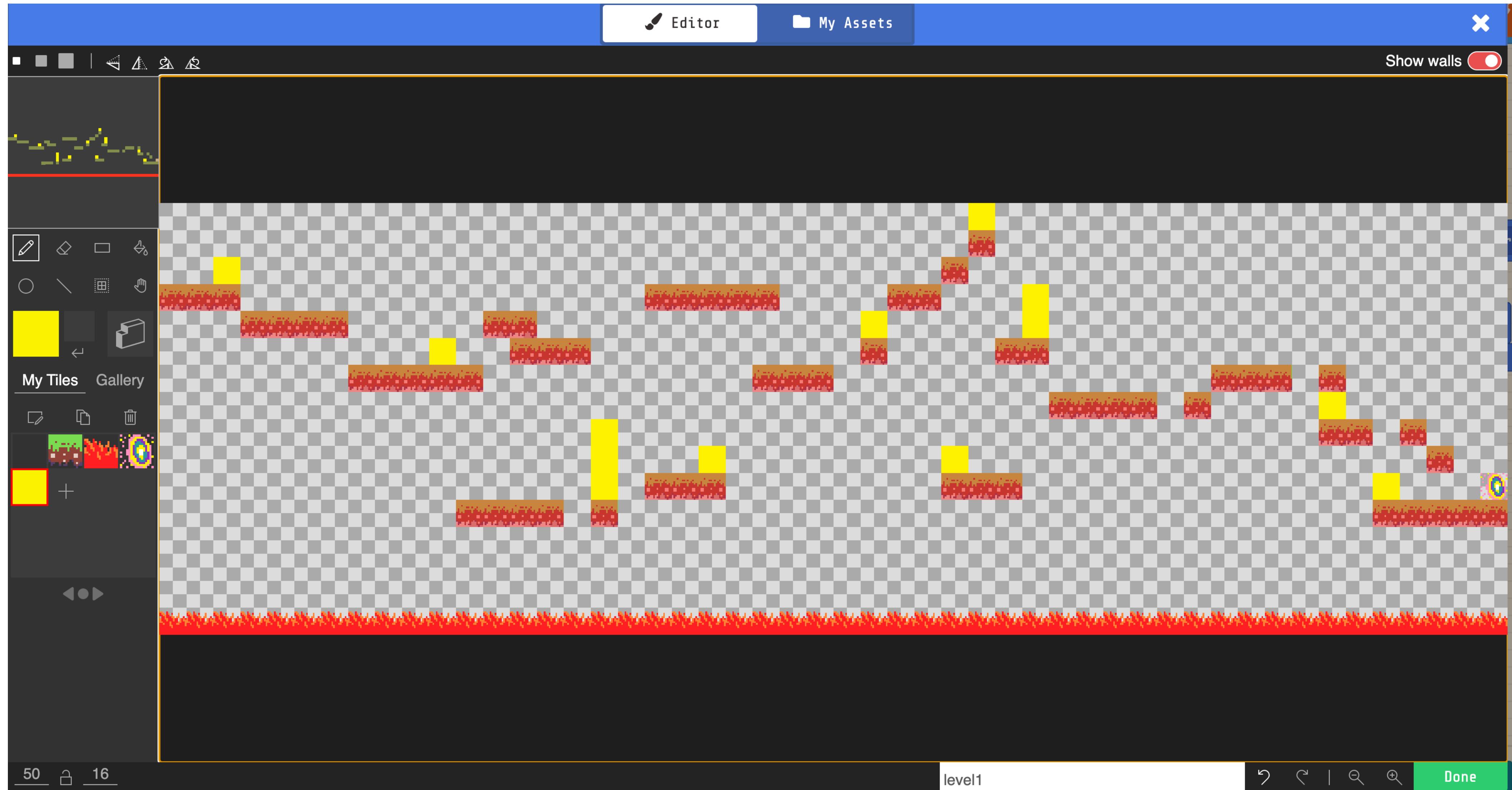
Click the + icon then make a yellow tile

Step 7: Spawning Tiles to make Coins

3



Step 7: Spawning Tiles to make Coins



4 Paint a few coin tiles across your platform

Step 7: Spawning Tiles to make Coins

```
on start
set background color to [light blue v]
set Duck to sprite [Player v] of kind [Player v]
move Duck with buttons vx [100] vy [0] [-]
set tilemap to [tilemap v]
set Duck ay (acceleration y) to [350]
camera follow sprite [Duck v]
for element [value v] of [list v]
do [ ]
```

5

Loops

Go to the Loops menu and add the code block to the bottom of your **On Start** code

```
on start
set background color to [light blue v]
set Duck to sprite [Player v] of kind [Player v]
move Duck with buttons vx [100] vy [0] [-]
set tilemap to [tilemap v]
set Duck ay (acceleration y) to [350]
camera follow sprite [Duck v]
for element [value v] of [array of all [ ] v locations]
do [ ]
```

6

Scene

- Go to the Scene menu and add the code block to where it said 'list'
- Select your yellow tile

Step 7: Spawning Tiles to make Coins

The script starts with an **on start** event. It sets the background color to light blue, sets the player sprite to a yellow duck, moves the duck with button inputs, sets the tilemap to a path, sets the duck's y acceleration to 350, and follows the camera after the duck. A **for element value of array of all [] locations** loop is present, which contains a **do** block that sets **mySprite** to a new player sprite.

7 **Sprites**

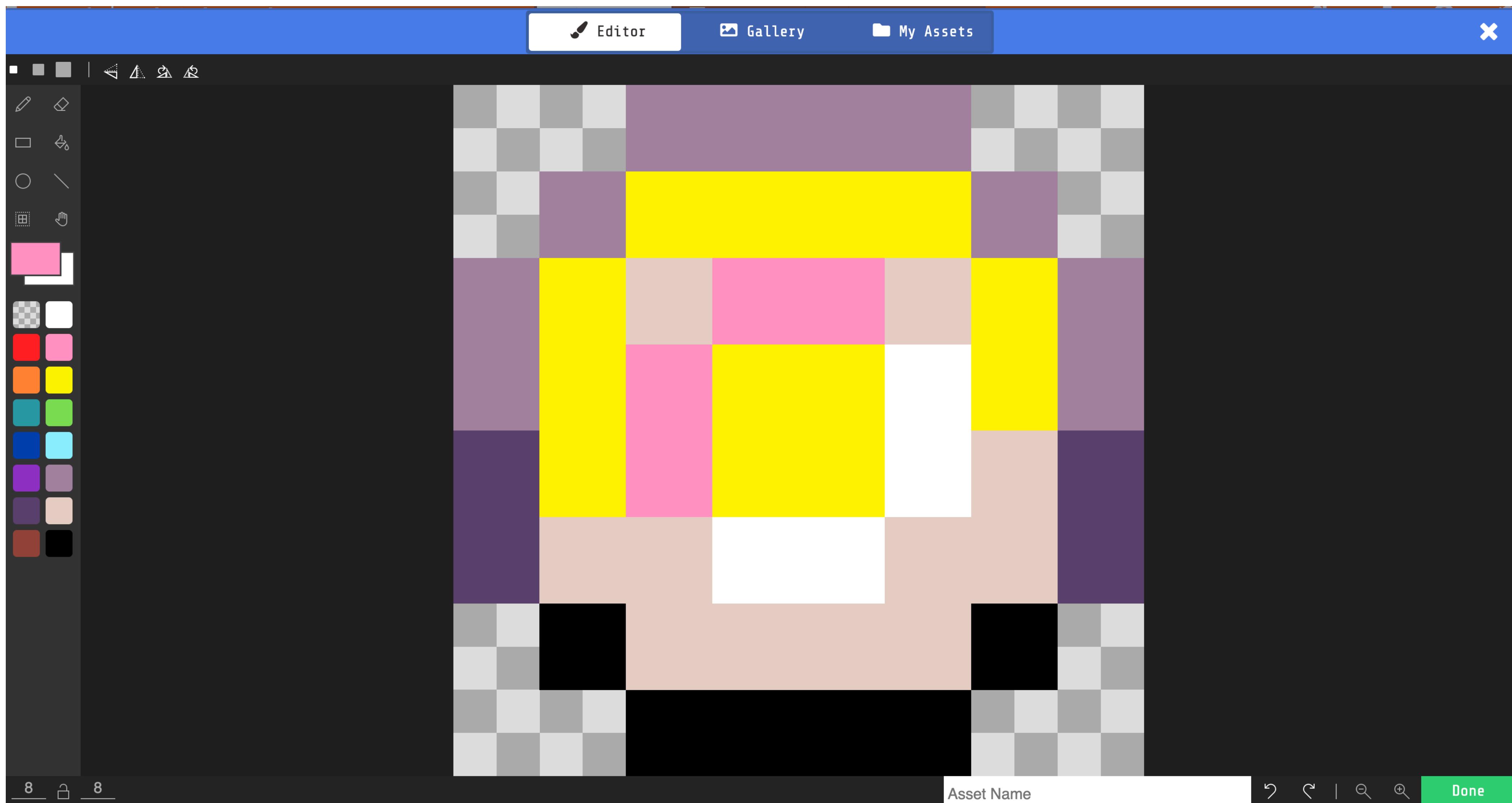
Go to the Sprites menu and add the code block

The script starts with an **on start** event. It sets the background color to light blue, sets the player sprite to a yellow duck, moves the duck with button inputs, sets the tilemap to a path, sets the duck's y acceleration to 350, and follows the camera after the duck. A **for element value of array of all [] locations** loop is present, which contains a **do** block that sets **mySprite** to a new player sprite. A context menu is open over the **mySprite** variable, showing options: Duck, list, mySprite, value, New variable..., Rename variable..., and Delete the "mySprite" variable.

- 8
- Rename mySprite to **coin**
 - Click on the grey tile and draw a coin or select a coin from the Gallery

Step 7: Spawning Tiles to make Coins

9



Step 7: Spawning Tiles to make Coins

A Scratch script starting with an "on start" hat. It sets the background color to light blue, sets the player sprite to a yellow duck, moves the duck with button inputs, sets the tilemap to a path map, sets the duck's acceleration y to 350, and follows the duck with the camera. A "for" loop then iterates over all locations (yellow squares). Inside the loop, it creates a coin sprite, places it on top of the tilemap at the current location, and adds a "value" variable to the coin.

```
on start
  set background color to [light blue v]
  set [Duck v] to [sprite v] of kind [Player v]
  move [Duck v] with buttons vx [100] vy [0] [-]
  set tilemap to [path map v]
  set [Duck v] [ay (acceleration y) v] to [350]
  camera follow sprite [Duck v]
  for [element v] of [array of all [ ] v] [locations]
    do
      set [coin v] to [sprite v] of kind [Player v]
      place [coin v] on top of [tilemap col [0] row [0]]
      [set [value v] of [value v] to [1 v]]
```

10 Scene

- Go to the Scene menu and add the code block
- Change where it says mySprite to **coin**

The same Scratch script as above, but with a modification. A white arrow points from the "value" variable in the "set value of value" block to the "value" parameter of the "place" block, indicating that the value variable should be moved to the "place" block.

```
on start
  set background color to [light blue v]
  set [Duck v] to [sprite v] of kind [Player v]
  move [Duck v] with buttons vx [100] vy [0] [-]
  set tilemap to [path map v]
  set [Duck v] [ay (acceleration y) v] to [350]
  camera follow sprite [Duck v]
  for [element v] of [array of all [ ] v] [locations]
    do
      set [coin v] to [sprite v] of kind [Player v]
      place [coin v] on top of [value v]
```

11 - Drag the value variable down to the block

Step 7: Spawning Tiles to make Coins

```
on start
  set background color to [light blue v]
  set Duck to sprite [duck v] of kind [Player v]
  move Duck with buttons vx [100] vy [0] [-]
  set tilemap to [tilemap v]
  set Duck ay (acceleration y) to [350]
  camera follow sprite Duck
  for element value of array of all [yellow square v] locations
    do
      set coin to sprite [coin v] of kind [Player v]
      place coin on top of value
      set [tilemap col 0 row 0 v] at [value v]
```

12

Scene

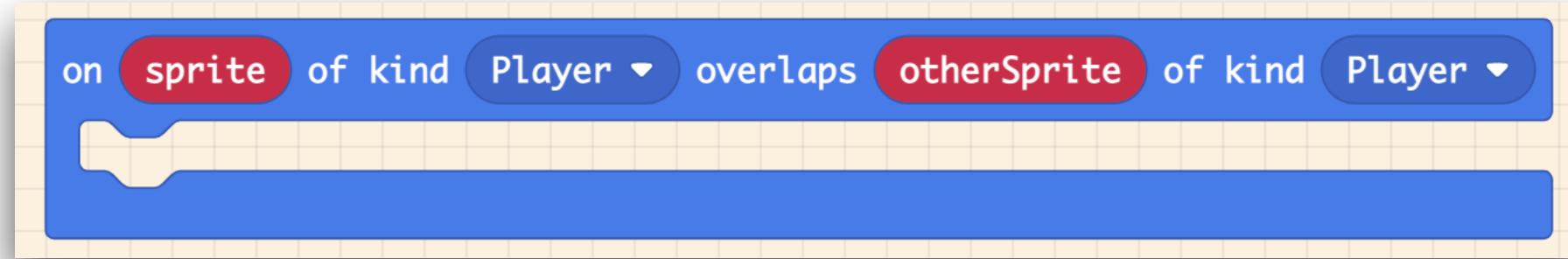
- Go to the Scene menu and add the code block

```
on start
  set background color to [light blue v]
  set Duck to sprite [duck v] of kind [Player v]
  move Duck with buttons vx [100] vy [0] [-]
  set tilemap to [tilemap v]
  set Duck ay (acceleration y) to [350]
  camera follow sprite Duck
  for element value of array of all [yellow square v] locations
    do
      set coin to sprite [coin v] of kind [Player v]
      place coin on top of value
      set [tilemap col 0 row 0 v] at [value v]
```

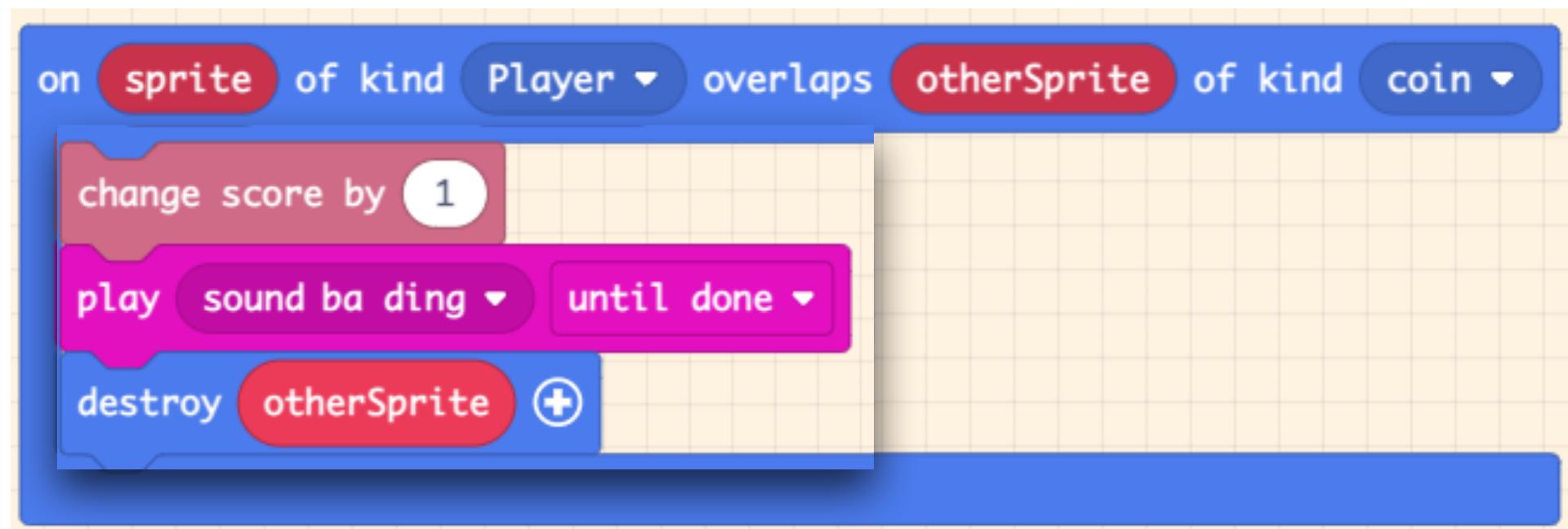
13

- Drag the value variable down to the block

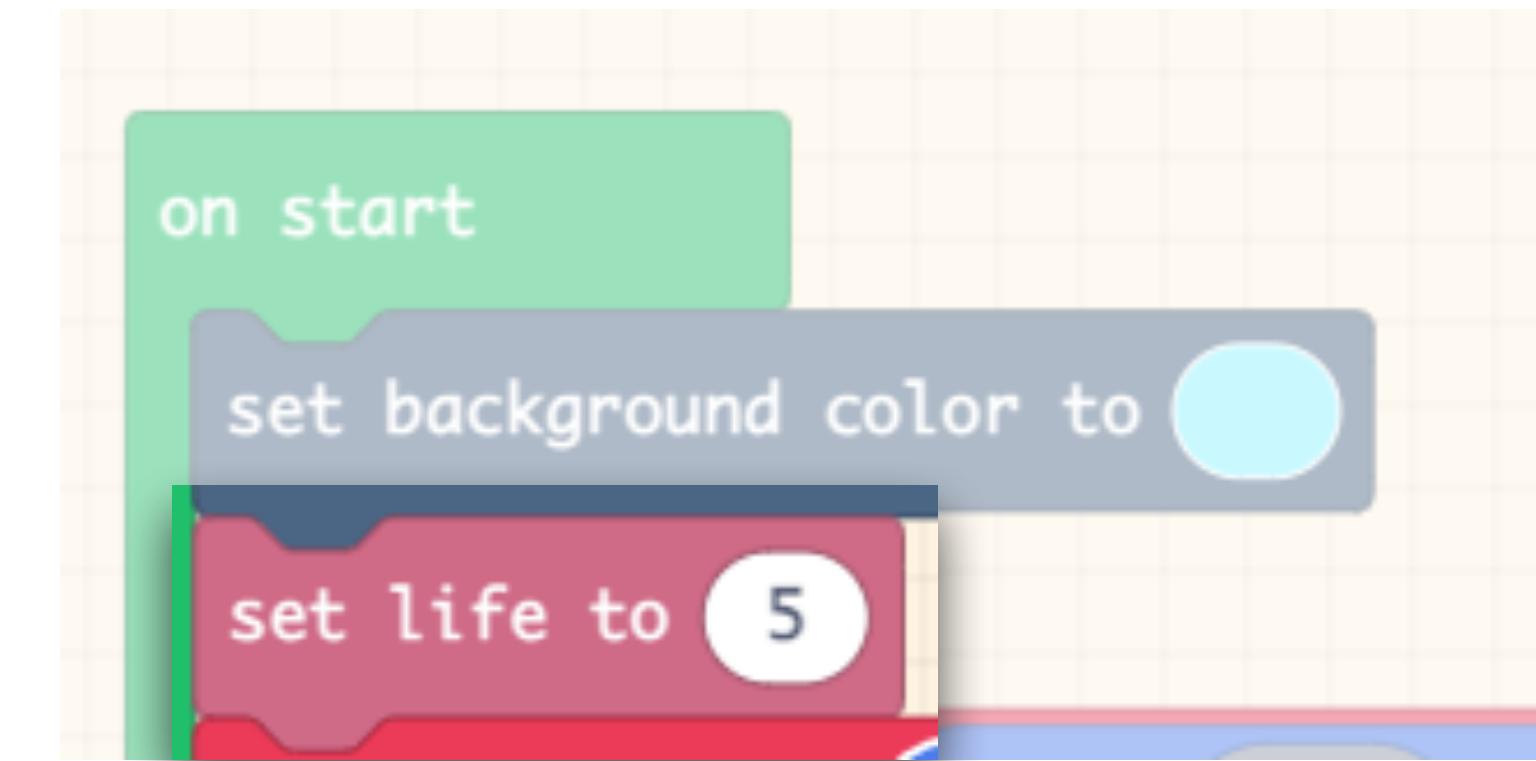
Step 8: Allow the Player to pick up the coins and gain life



- 1 - Go to the Sprites menu and add the code block
- This is a **NEW LINE OF CODE**

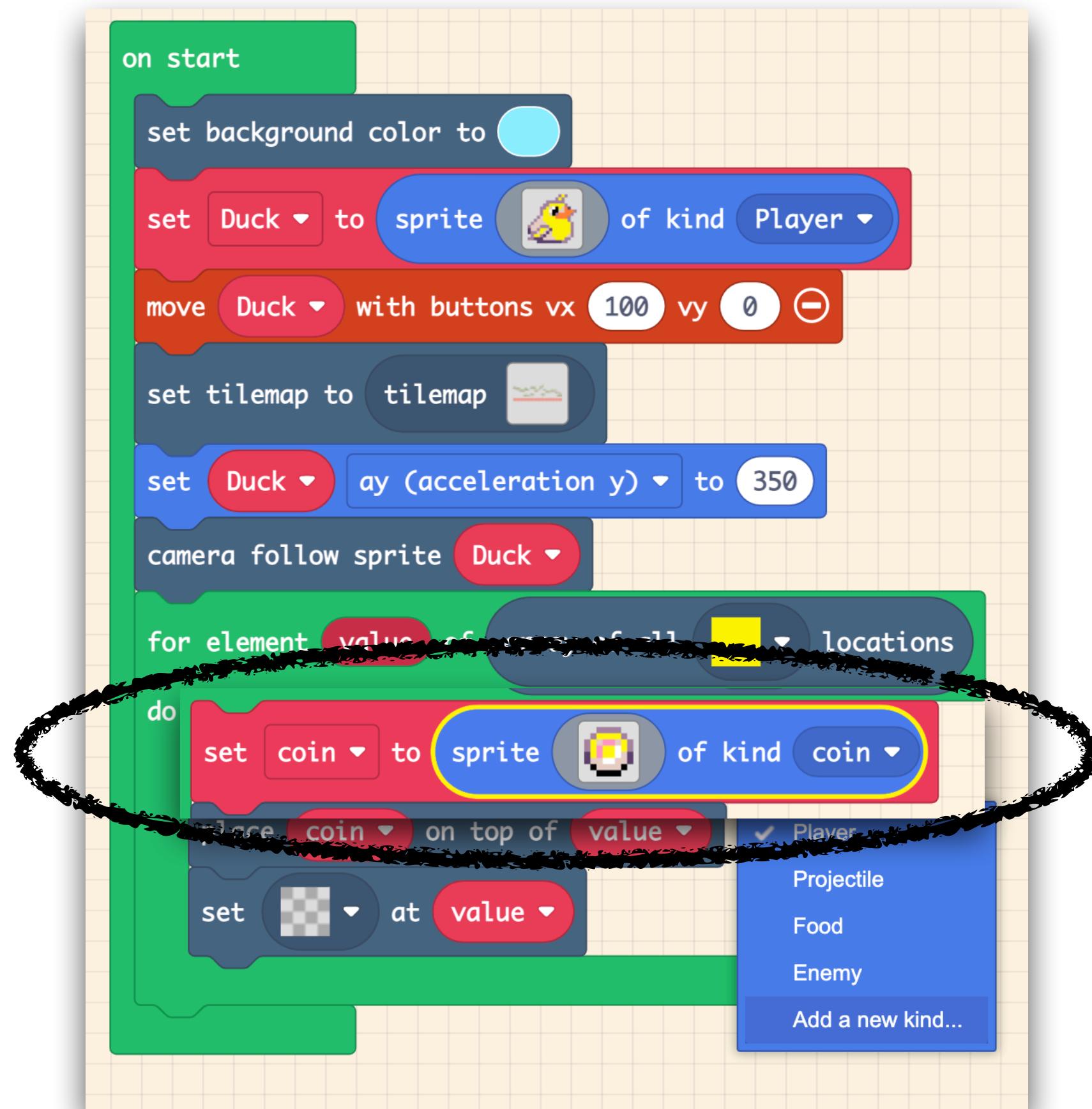


- 2 - Pull in the following code blocks

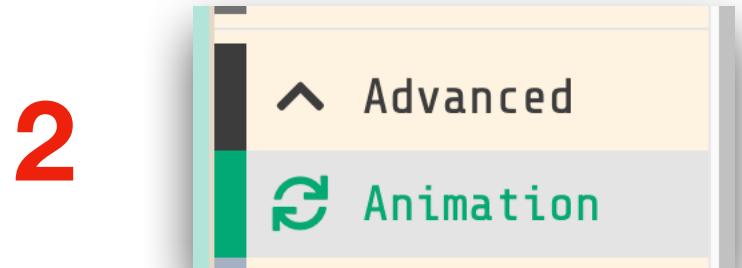


- 3 - Head back over to your ON START code
- Drag in the 'set life to' code block and enter 5

Step 8: Animate your coins

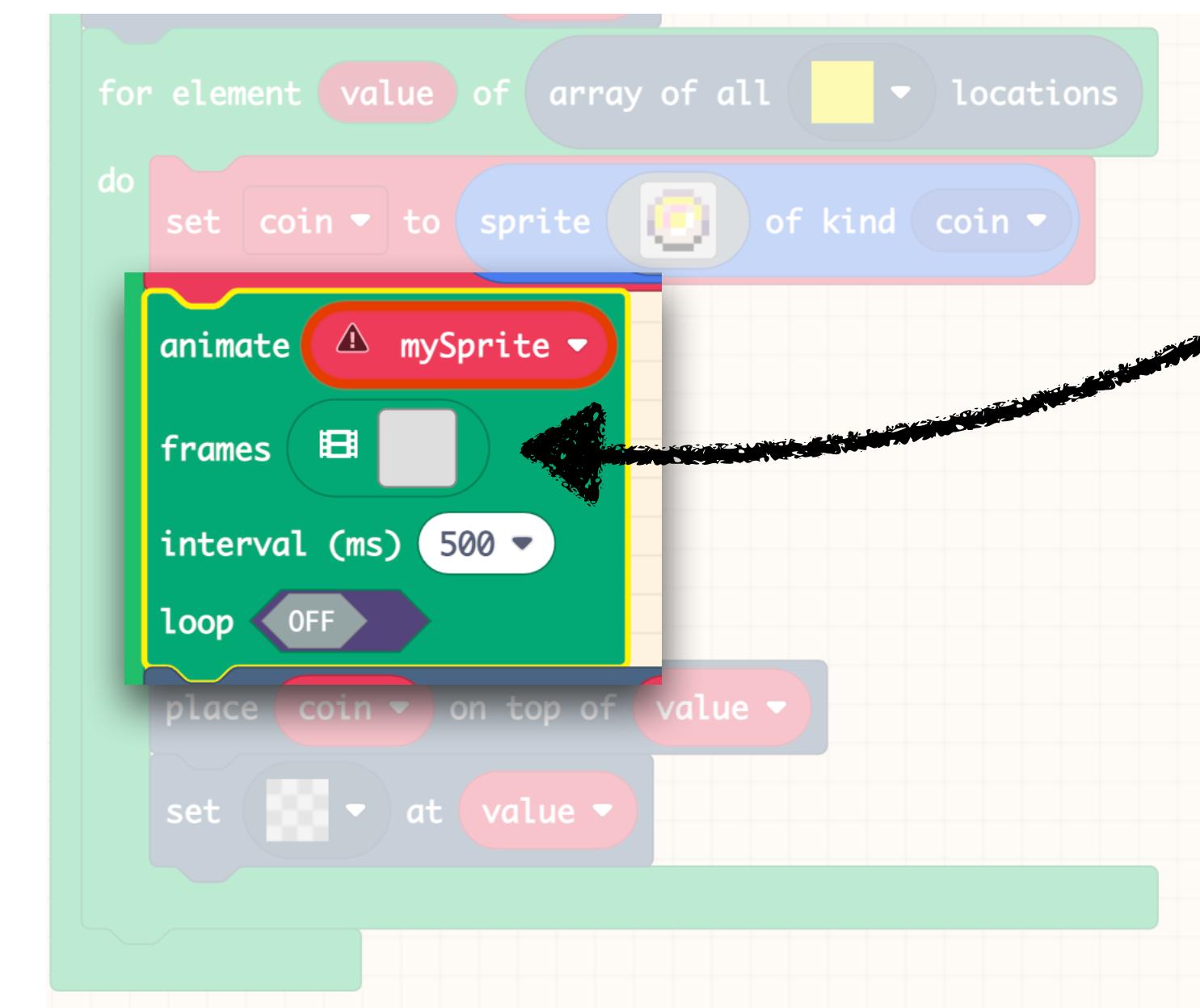


- 1**
- Head over to your ON START code
 - Where you see the coin block 'kind of player' select 'Add a new kind' and call it **coin**



2

- Go to the Advanced > Animation menu and drag in this code block

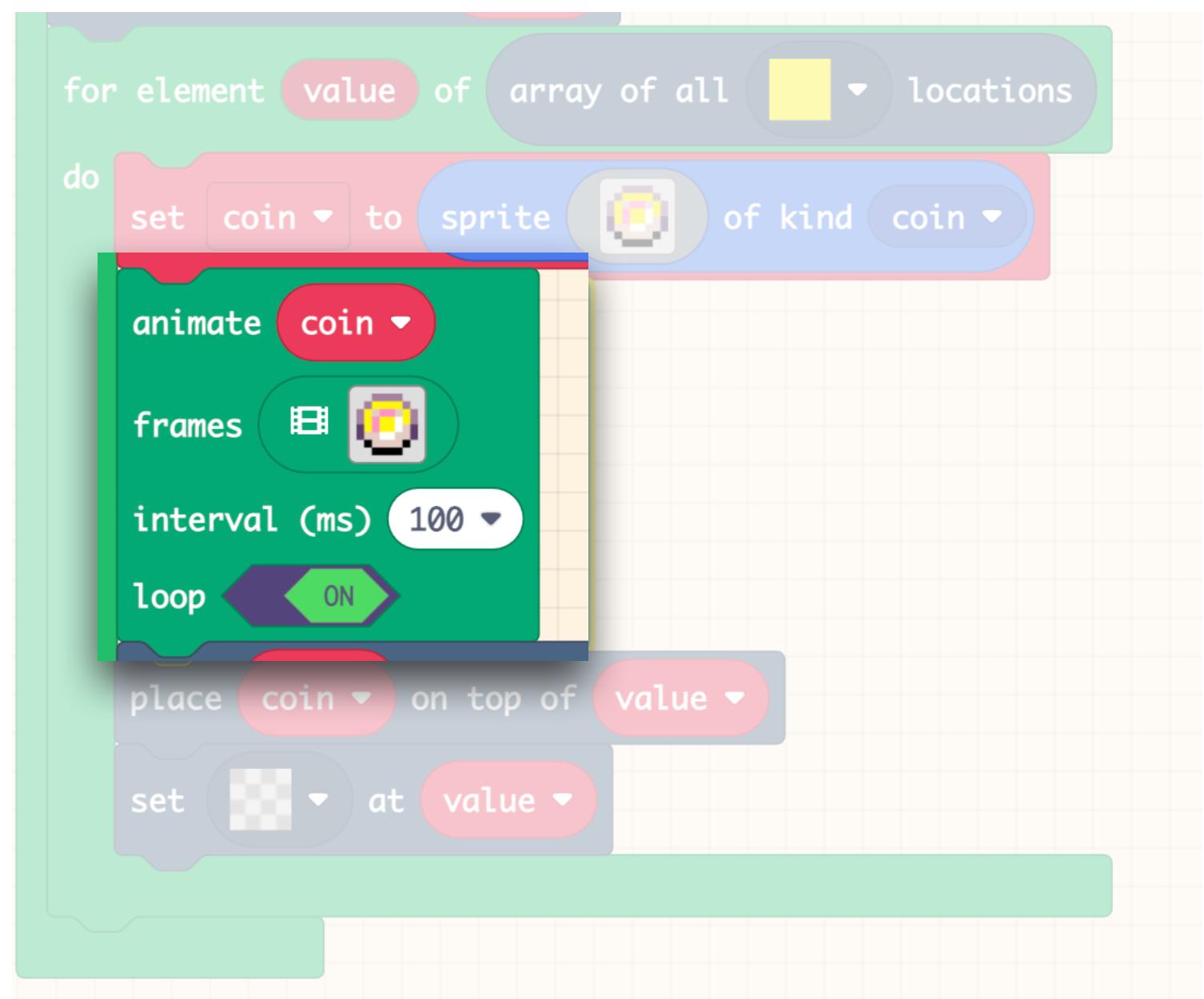


- 2**
- Click the grey tile then head Emma for an Animation walkthrough

Step 8: Add a Coin Animation

3

- After you have finished your animation, set the code to look like this



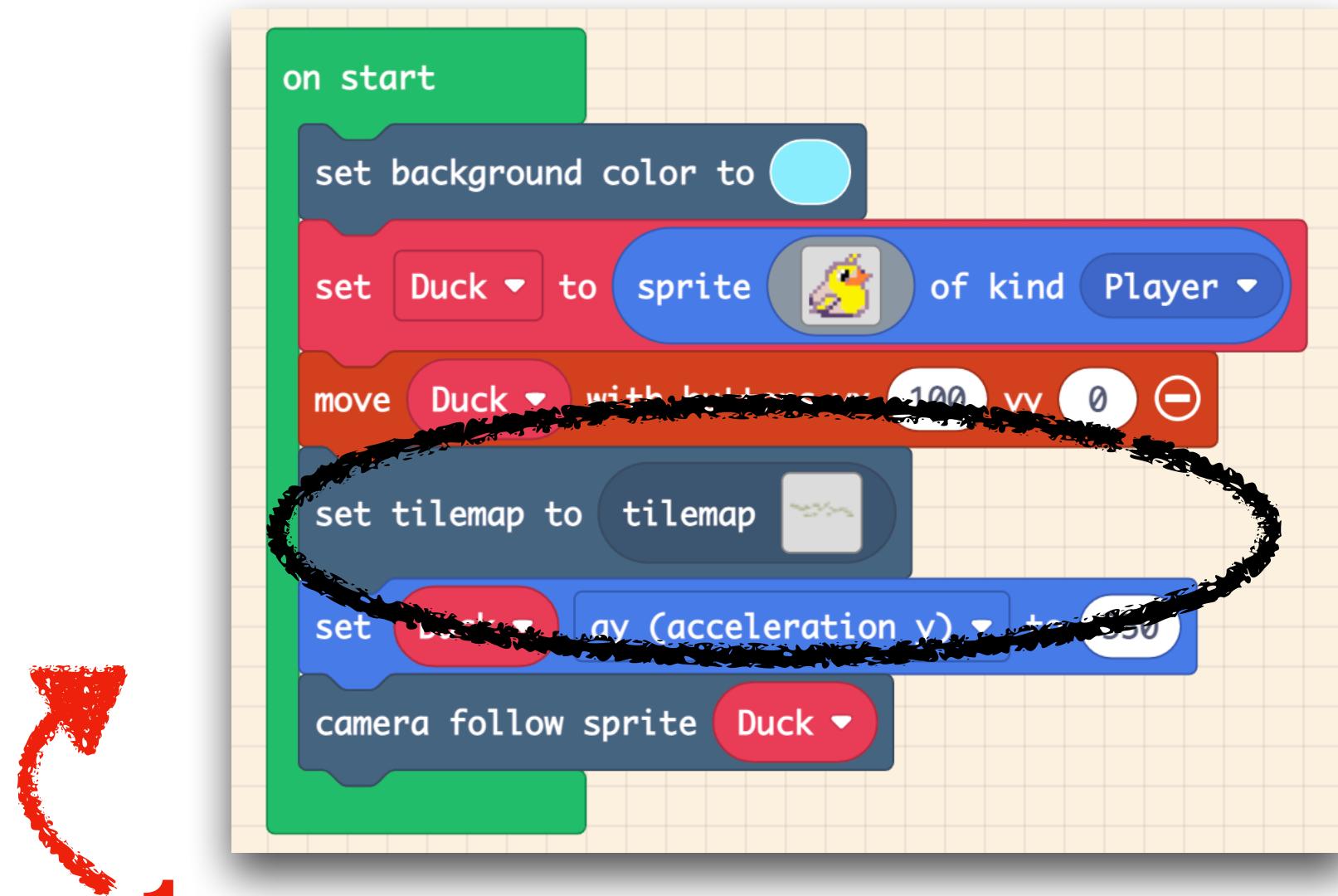
TEST YOUR GAME!

- Coins should be spinning on your game
- When you collect them you should see your points go up

Let's add enemies...

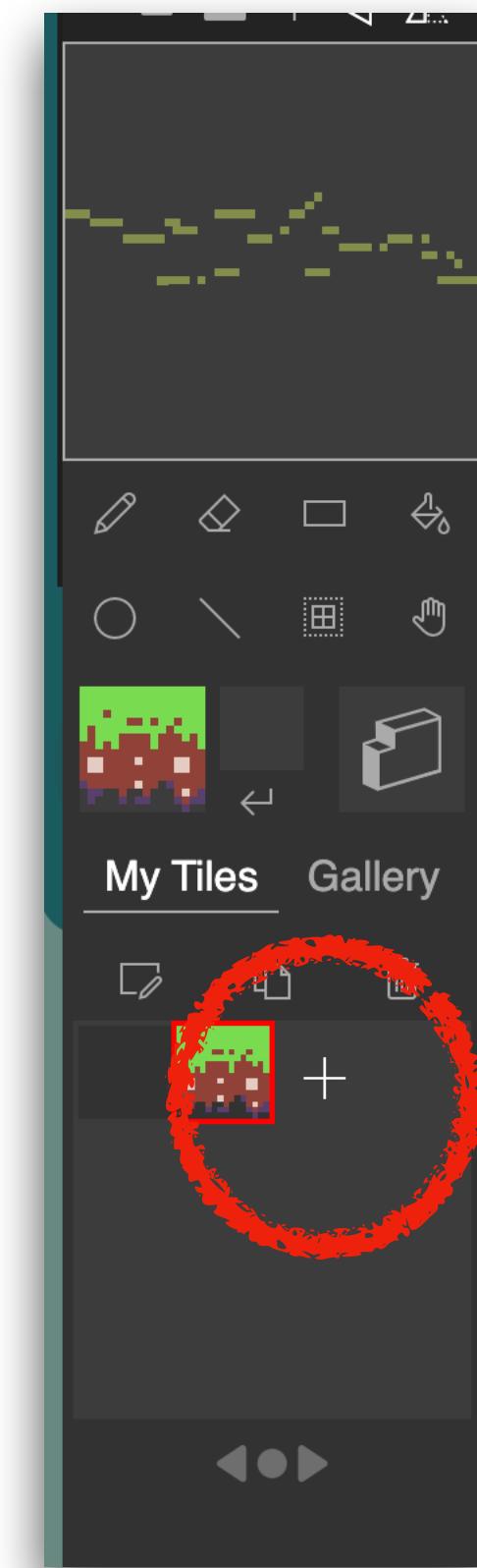
>:D

Step 9: Making Enemies



1

Click on the grey Tile Map box

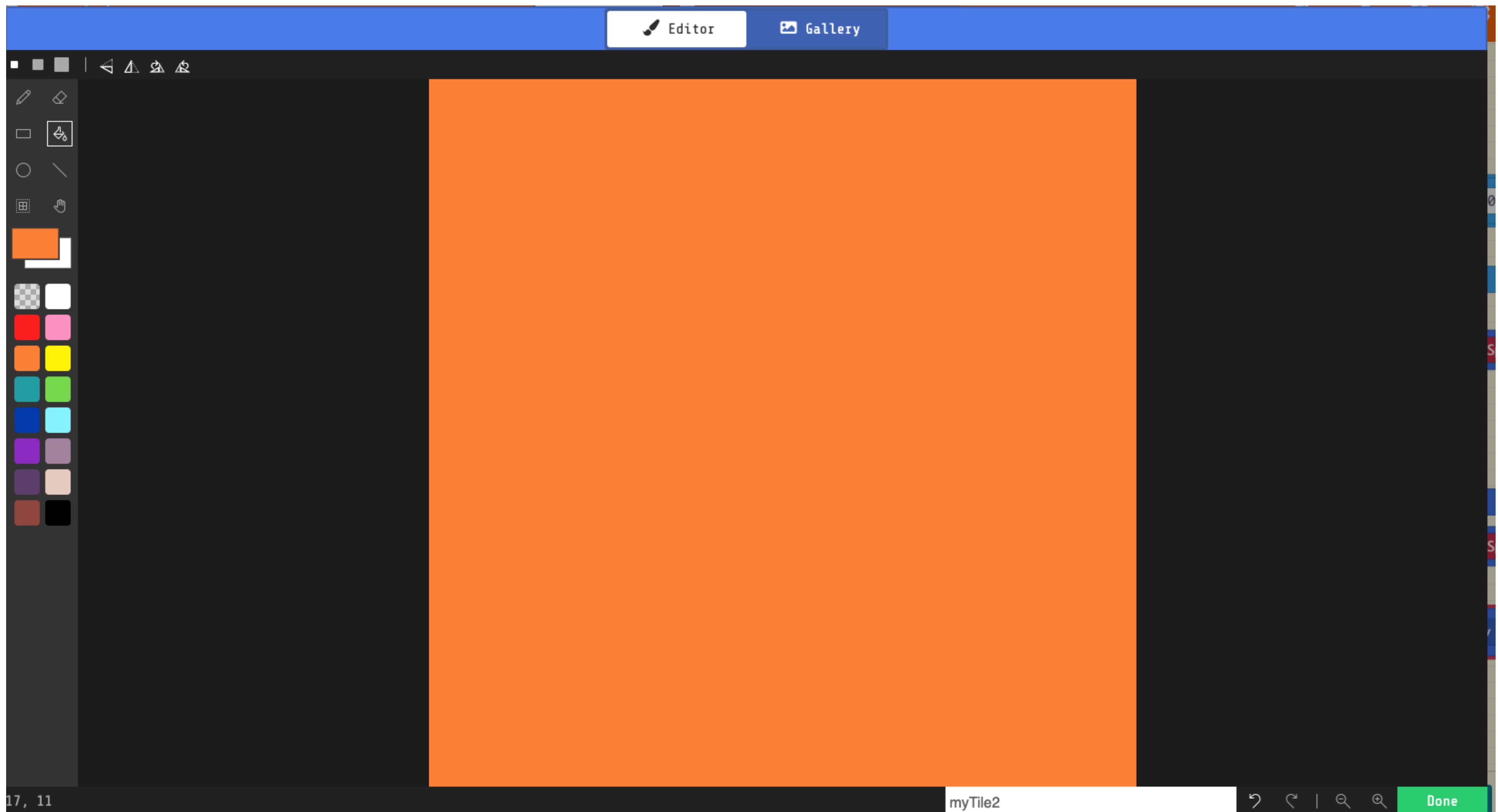


2

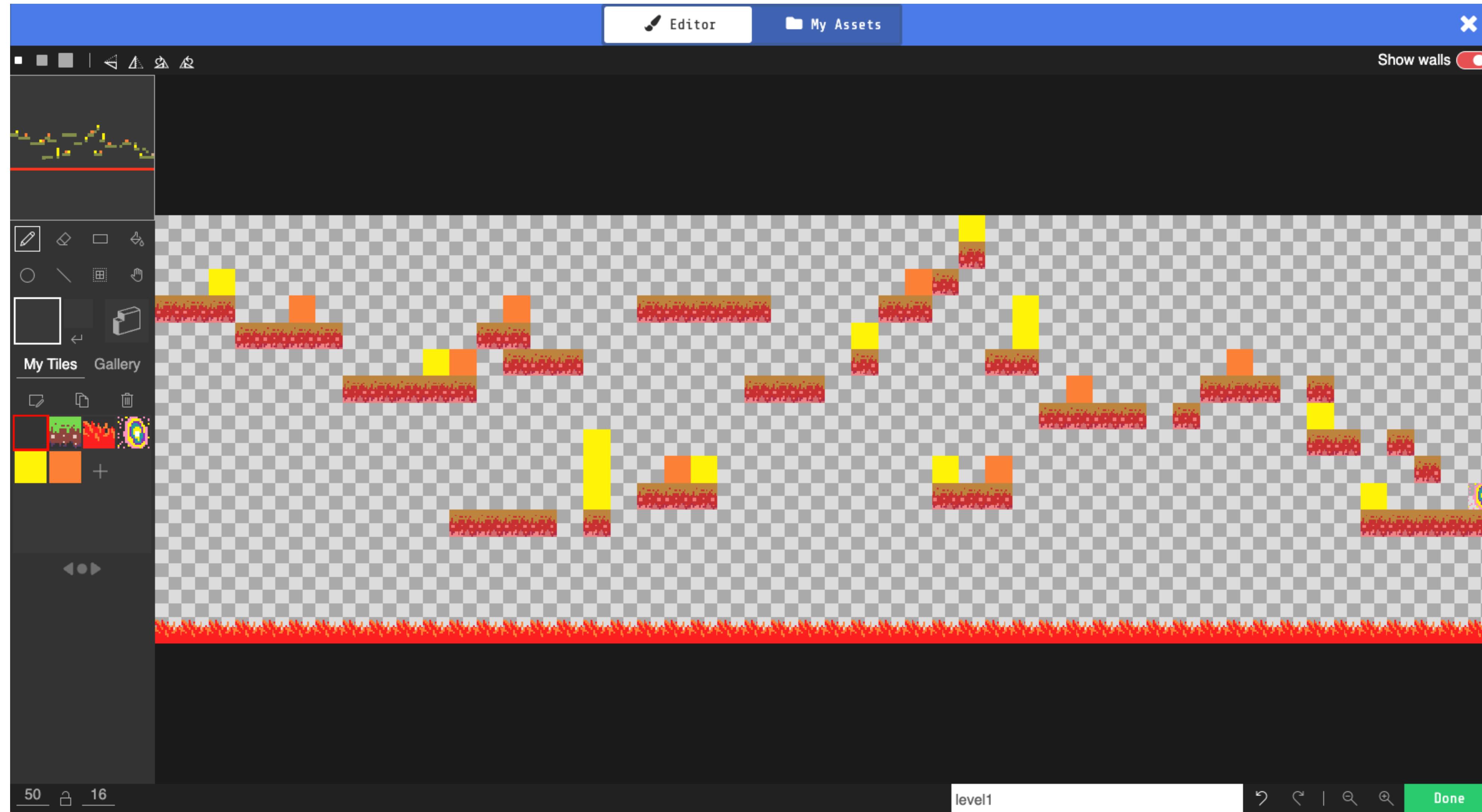
Click the + icon then make an **ORANGE** tile

Step 9: Making Enemies

3



Step 9: Making Enemies

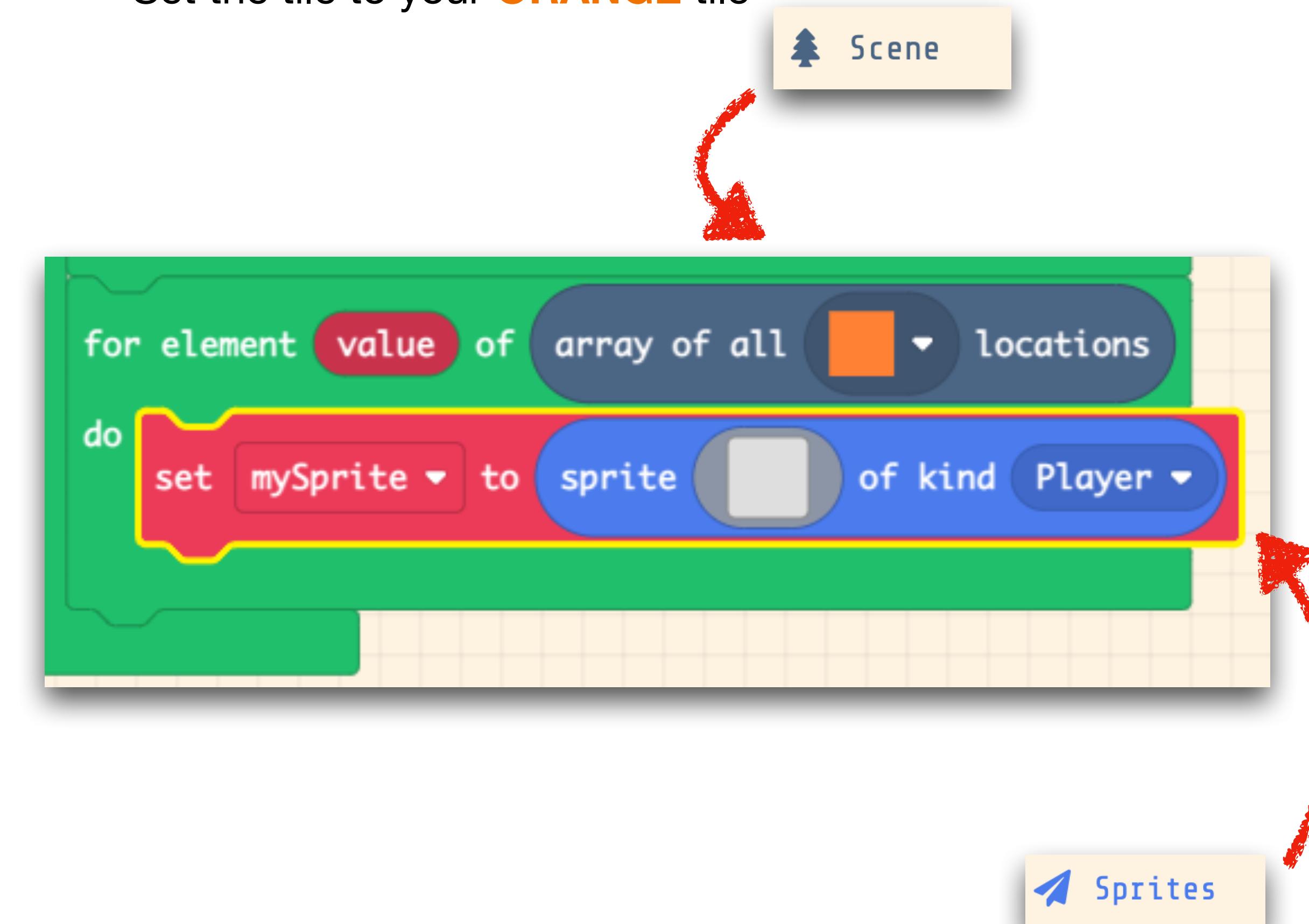


4 Paint a few coin tiles across your platform

Step 9: Adding enemies

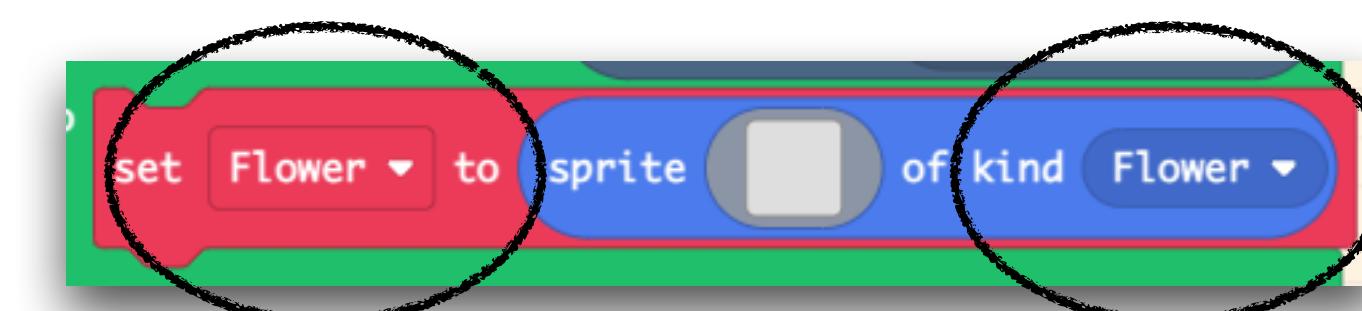
6

- Drag in this code block from the Scene menu
- Set the tile to your **ORANGE** tile



- 5
- Add the following code block underneath your coin animation code

- 7
- Drag in this code block from the Sprites menu
 - Create a new variable called Flower
 - Create a new kind called Flower



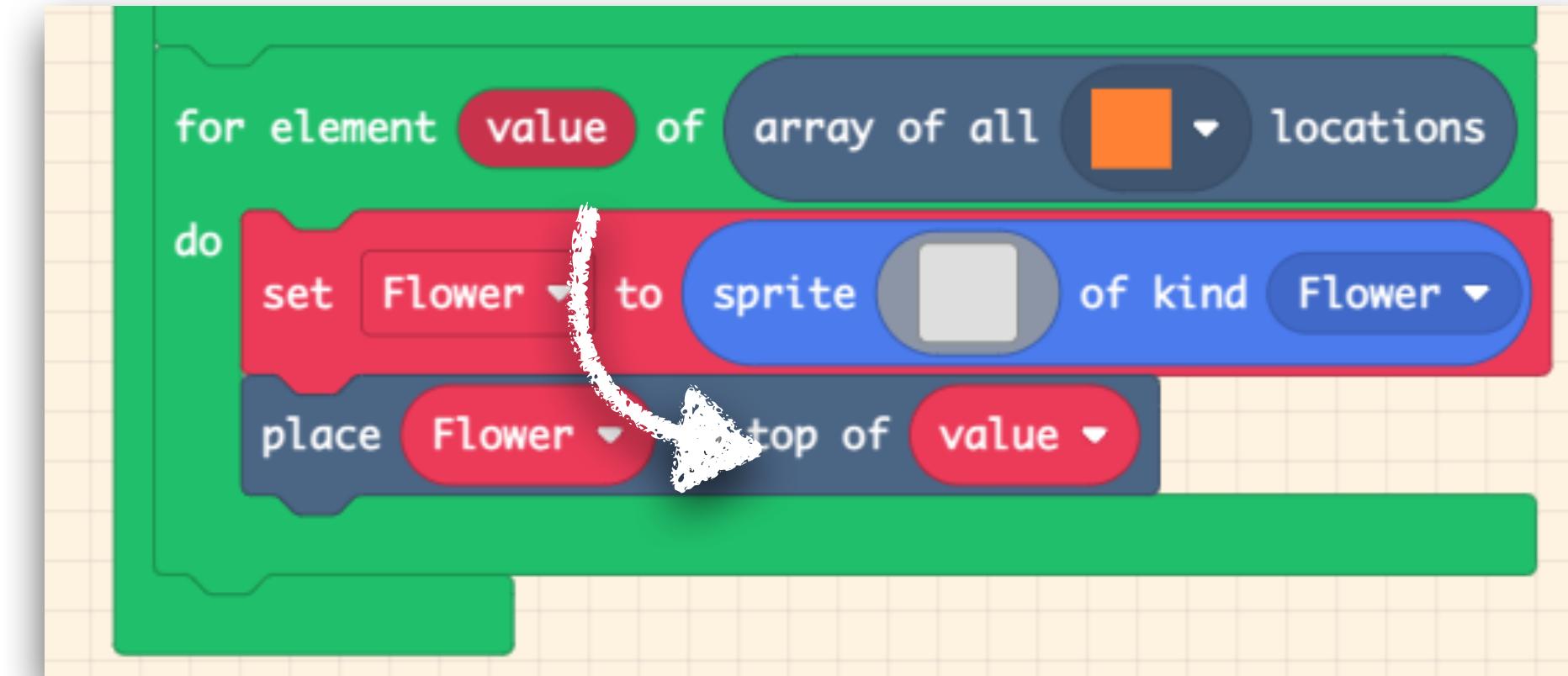
Step 9: Adding enemies



9 Scene

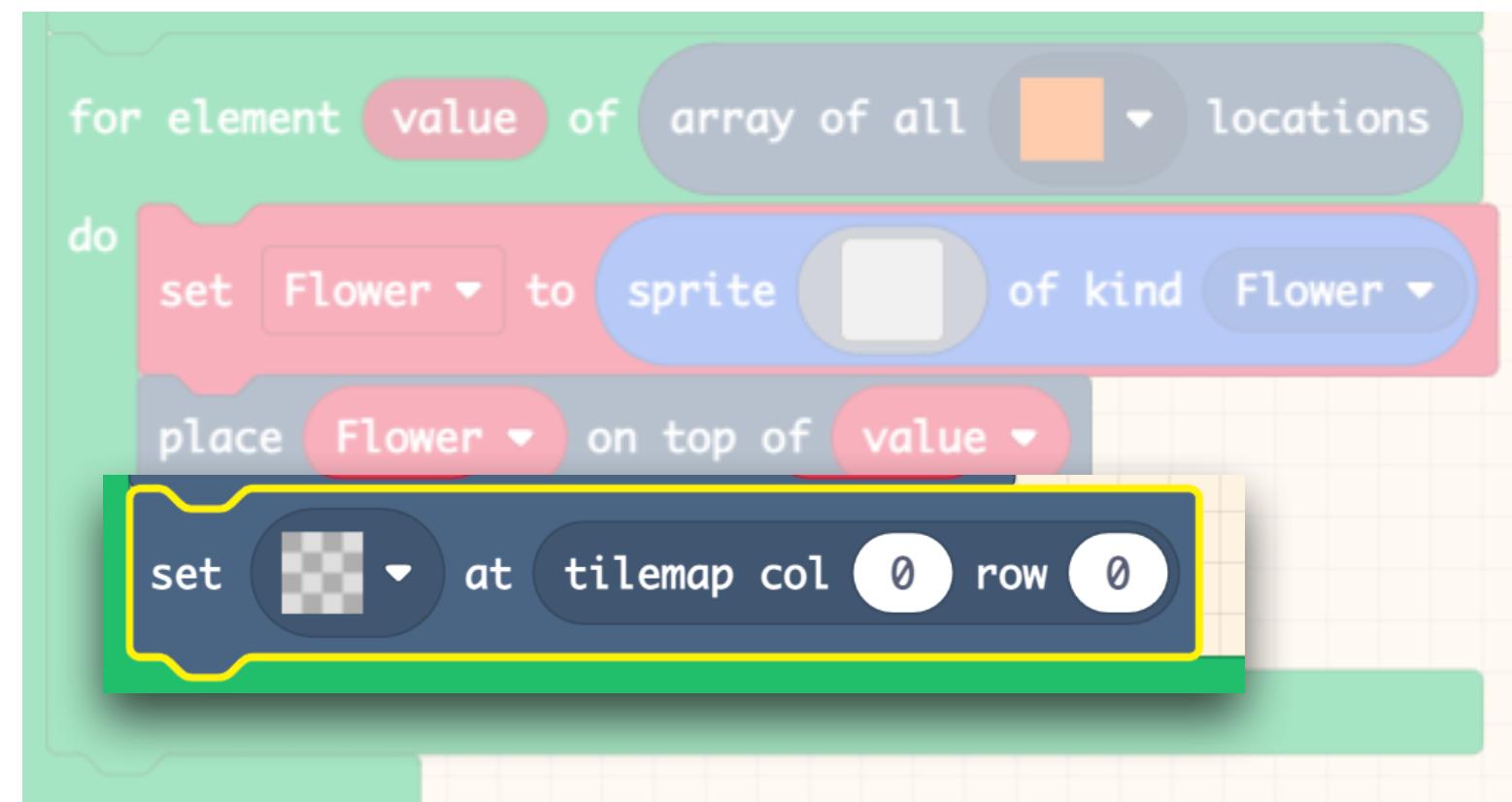
- Go to the Scene menu and add the code block
- Change where it says mySprite to **flower**

- 8** - Click on the tile and draw a flower or choose one from the gallery



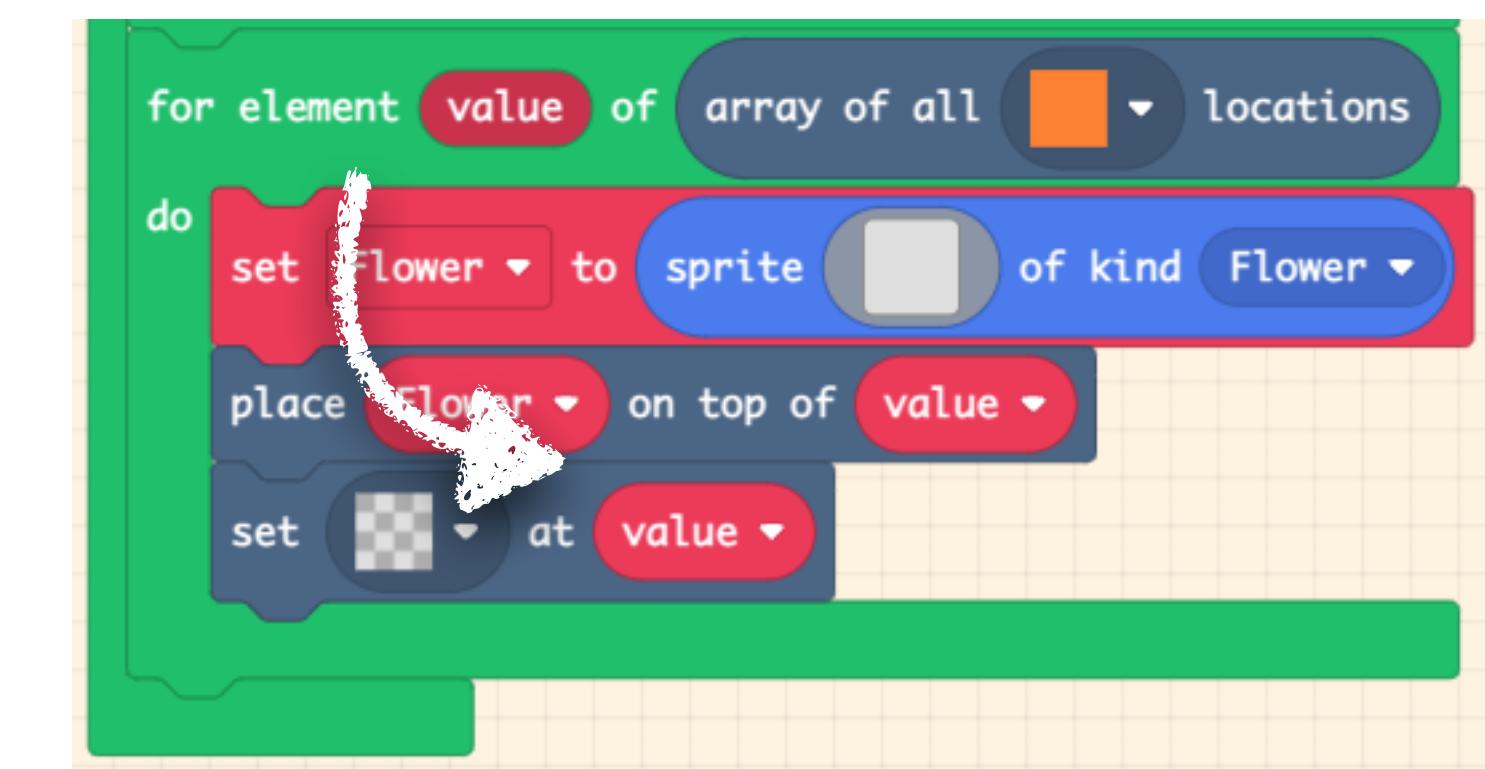
- 10** - Drag the value variable down to the block

Step 9: Adding enemies



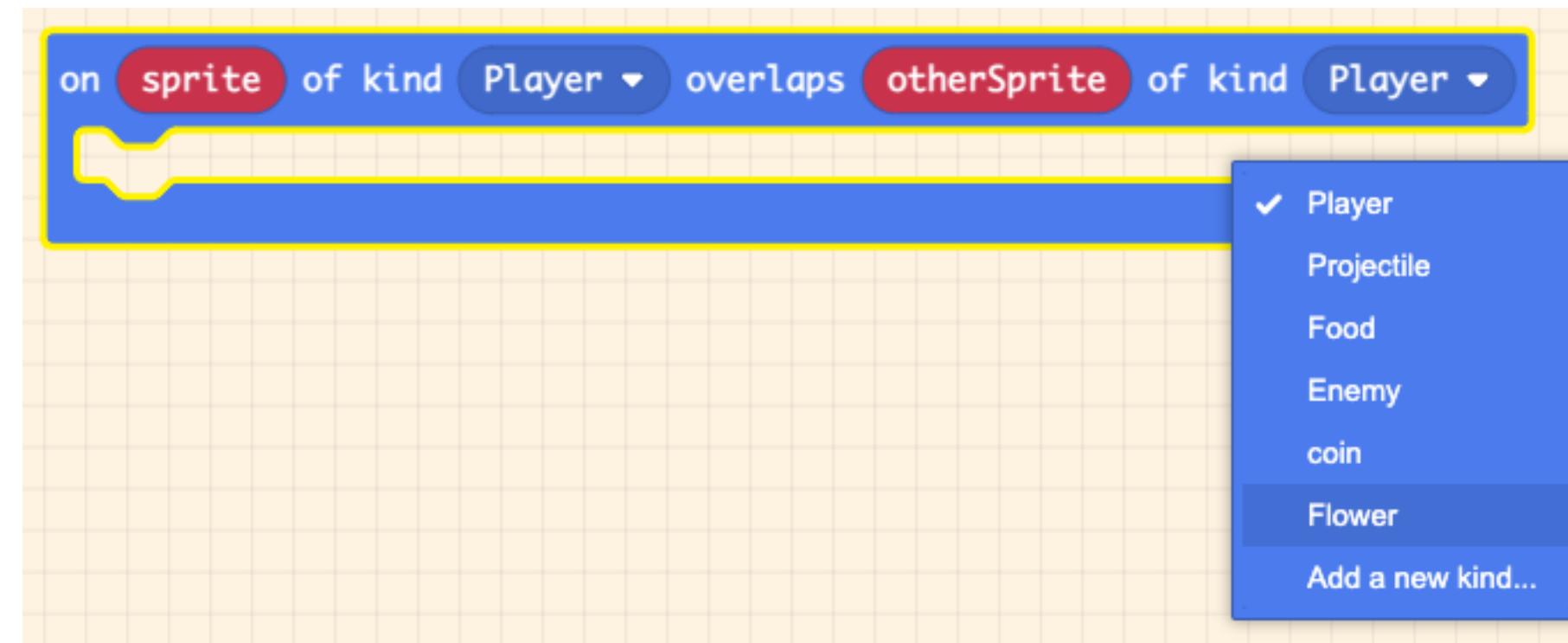
11 Scene

- Go to the Scene menu and add the code block



12 - Drag the value variable down to the block

Step 10: What happens if a player overlaps a flower?



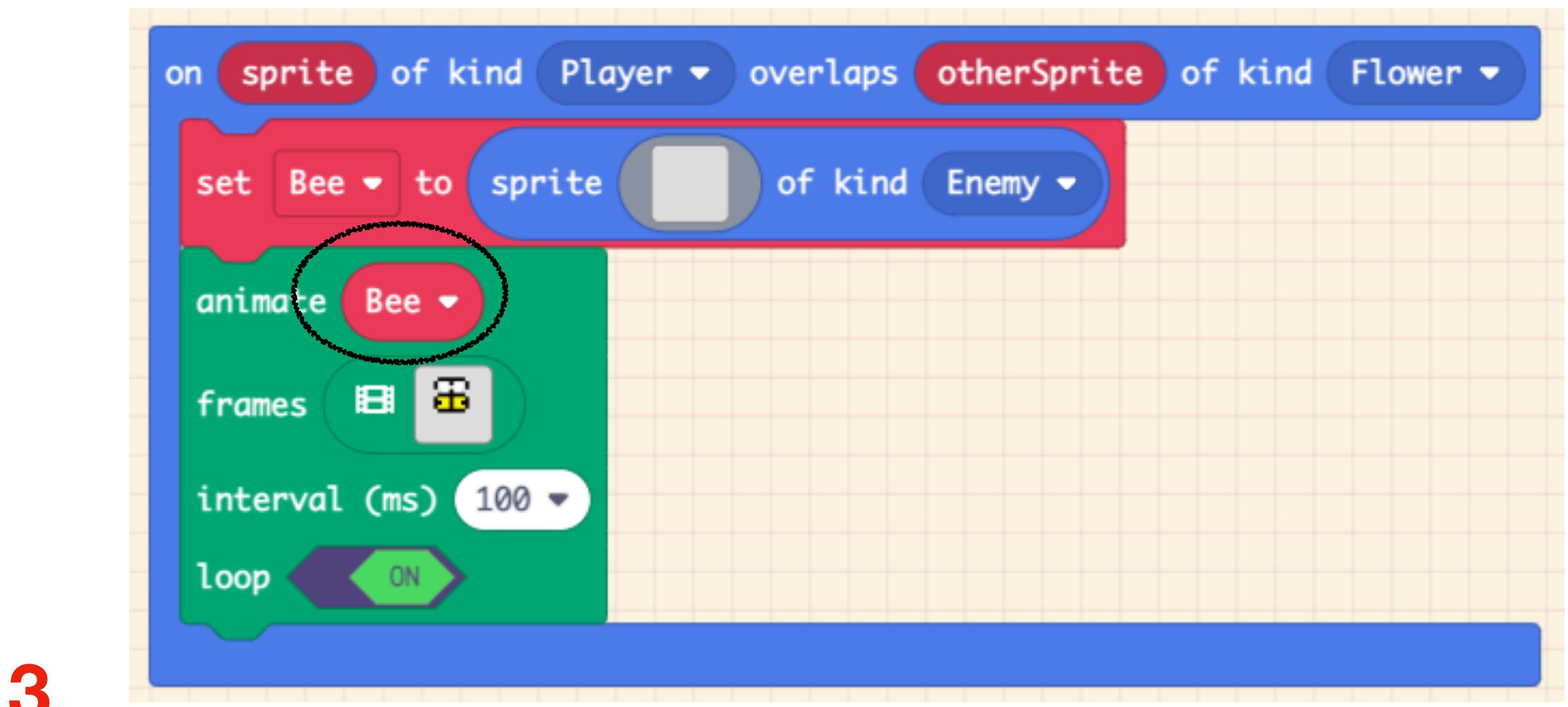
1 Sprites

- Go to the Scene menu and add the code block
- Select '**Flower**' in the last section

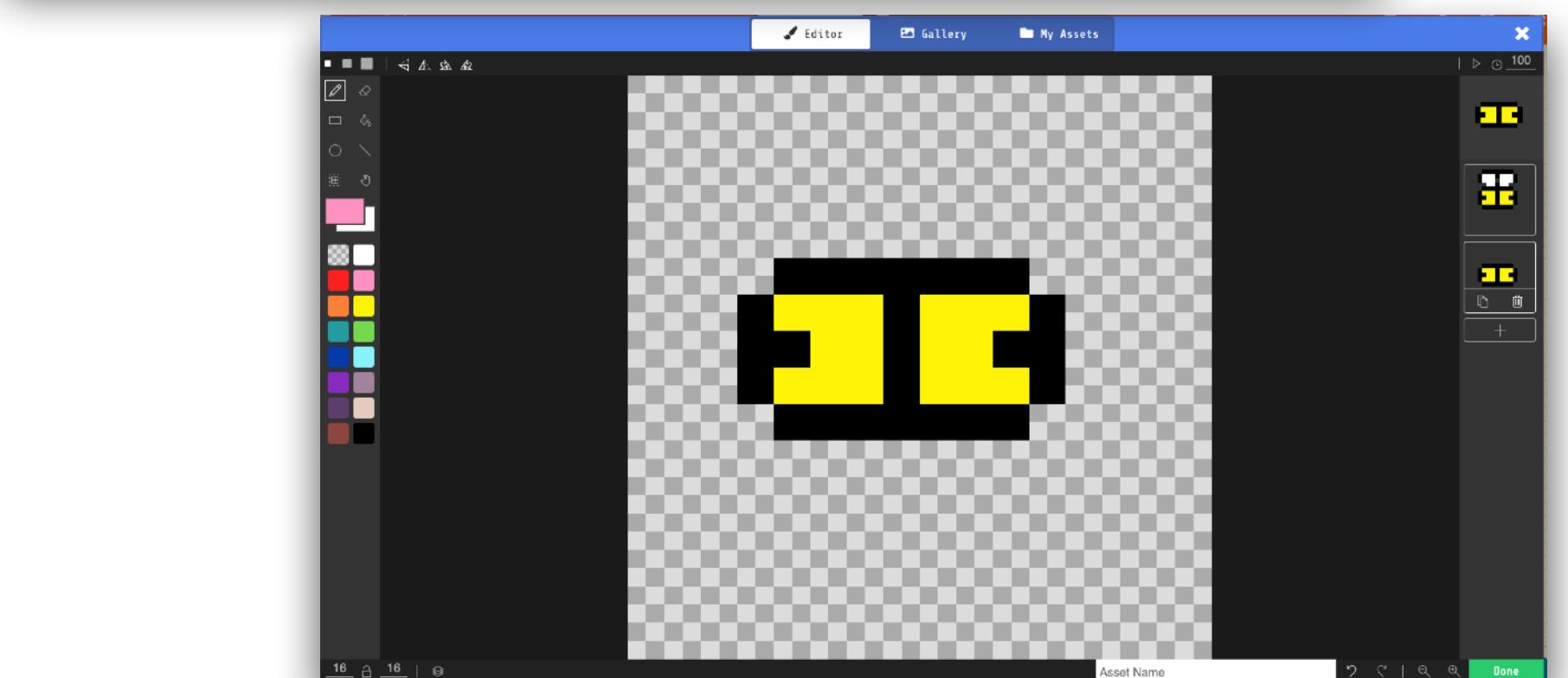
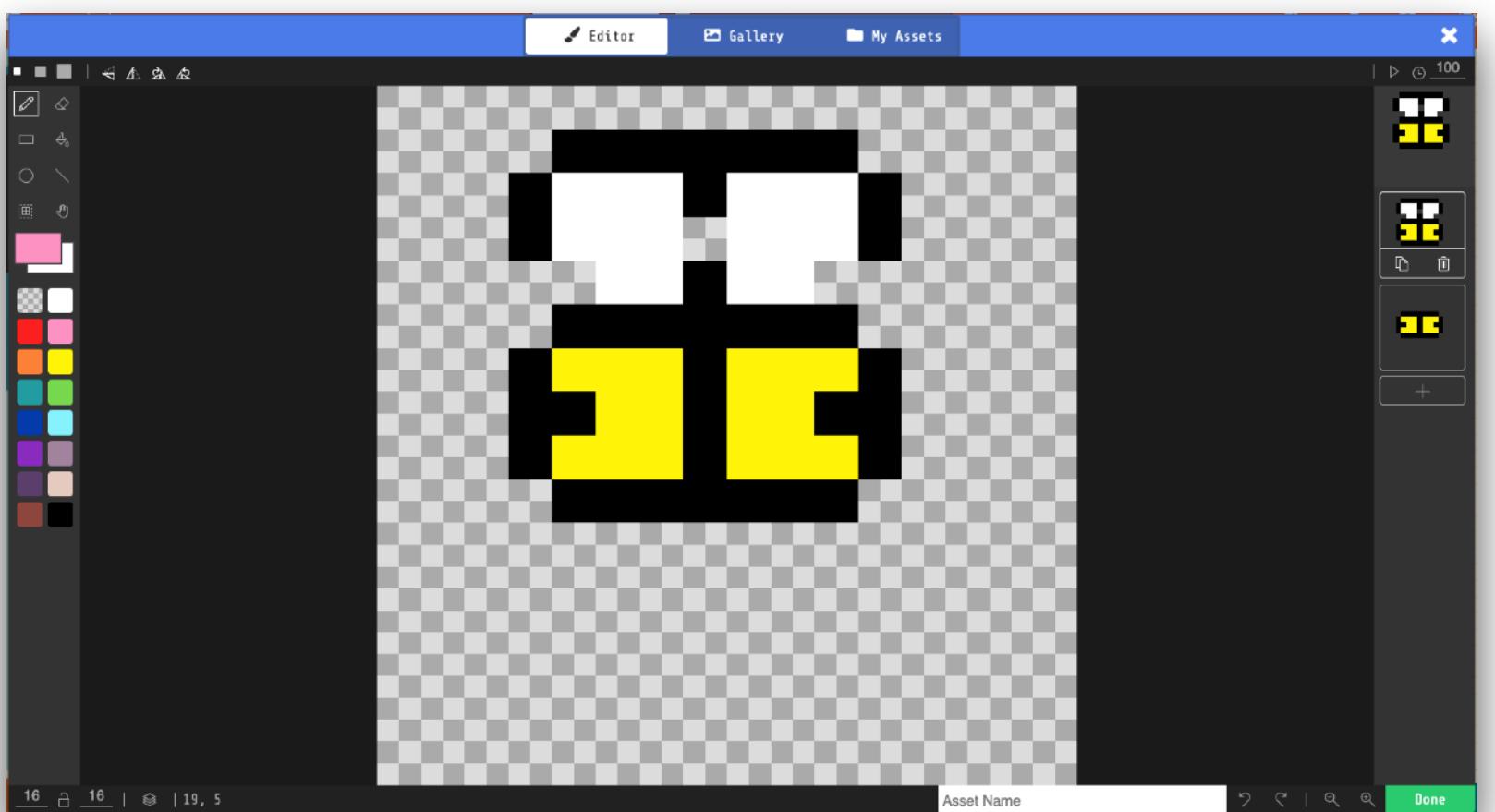
2 Sprites

- Go to the Sprites menu and drag in the 'Set mySprite to' block
- Create a new variable and call it '**Bee**'
- Set the kind to '**Enemy**'

Step 10: What happens if a player overlaps a flower?



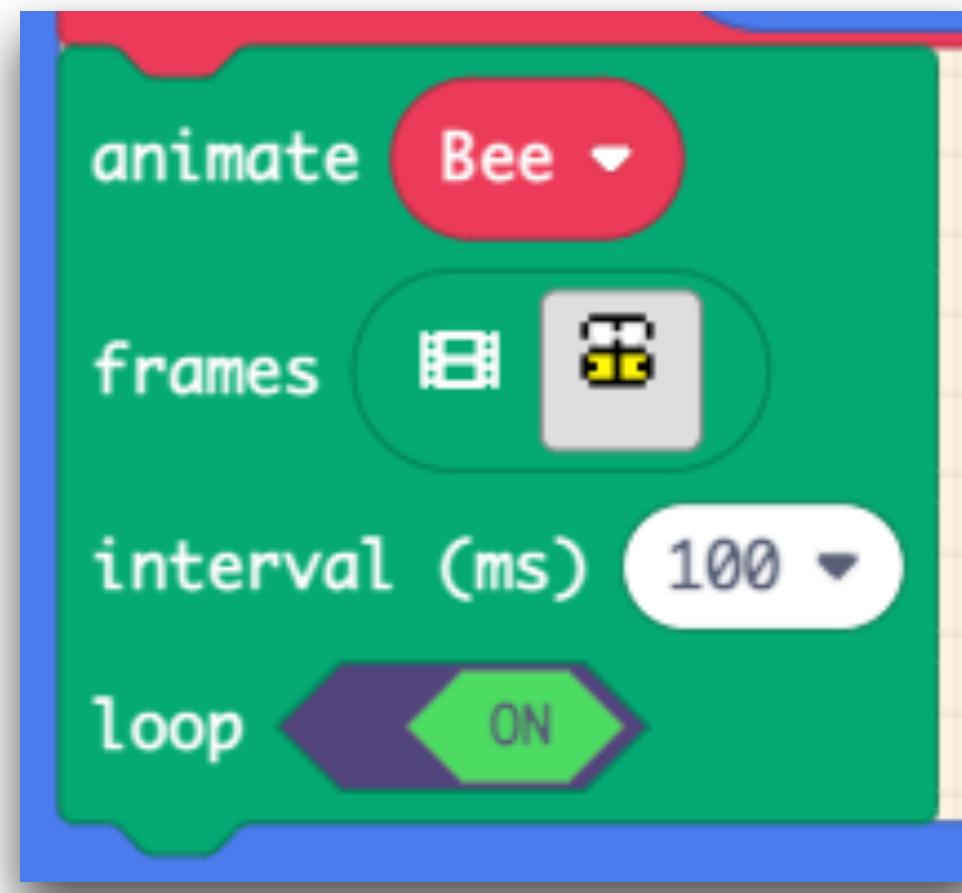
- Instead of drawing a bee, drag in the animation block and select 'Bee' in the variable box
- Click on the tile beside *frames* and draw a bee...



4

- Draw one with wings
- Click the duplicate button
- Erase the wings from the second image

Step 10: What happens if a player overlaps a flower?



5

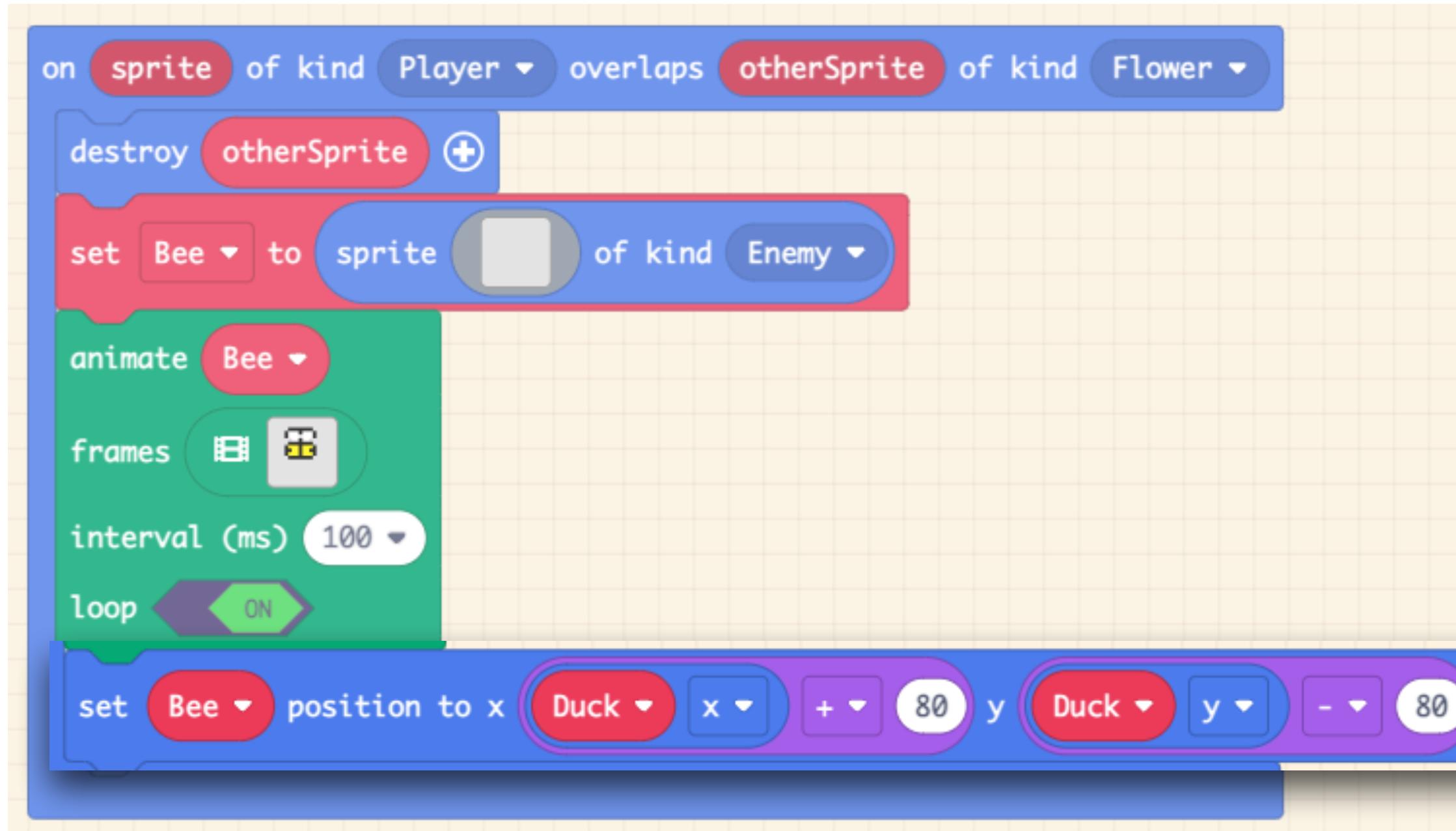
- Set the interval to 100
- Loop the animation (select ON)

6

- Drag in a 'destroy' sprite block and place it at the top
- Drag the 'otherSprite' variable into the Destroy code block

Step 11: Set the Bee's position

This section is complex; if you are stuck call on Emma!

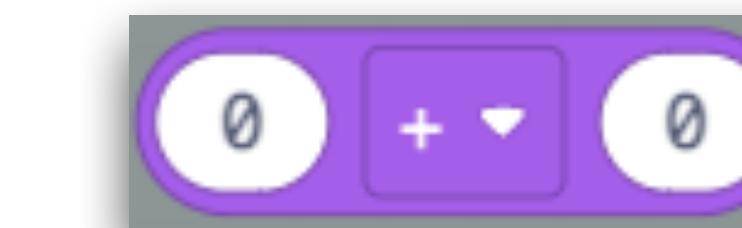


1



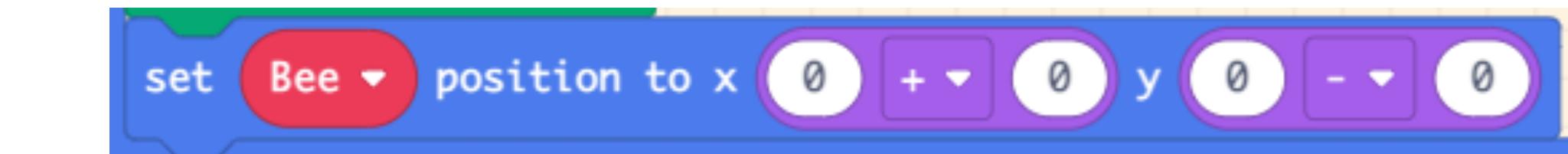
- Go to Sprites and drag in this block
- Change **mySprite** to **Bee**

2



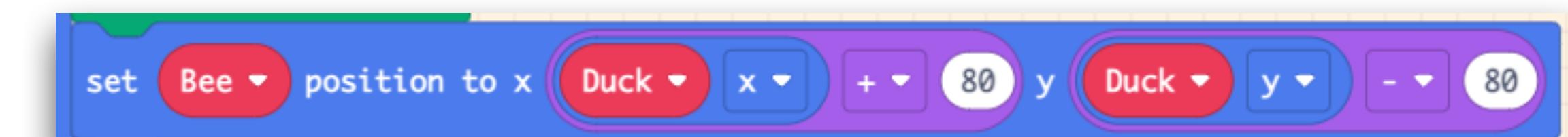
- Go to Math and drag in 2 of these blocks
- Drop them into the **x** and **y** sections
- Set the first one to **+**
- Set the second one to **-**

3



- Go to Sprites and drag in 2 of these blocks
- Drop them into the first 0 of each Math block
- Set the code to the example below

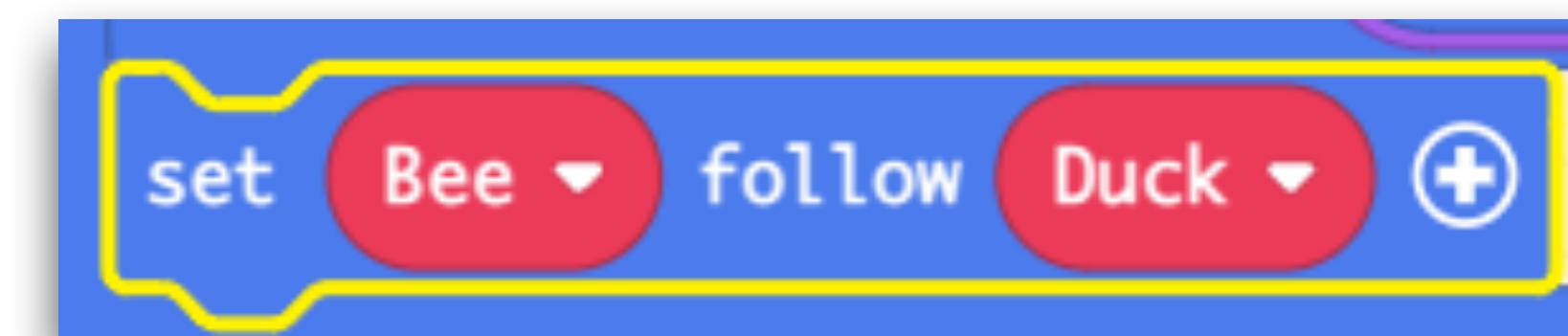
It should look like this



Step 11: Set the Bee's position

The script starts with a condition "on sprite of kind Player overlaps otherSprite of kind Flower". It contains the following blocks:

- destroy otherSprite
- set Bee to sprite [] of kind Enemy
- animate Bee
- frames [] []
- interval (ms) 100
- loop []
- set Bee position to x [Duck x + 80] y [Duck y - 80]
- set [! myEnemy follow ! mySprite] +



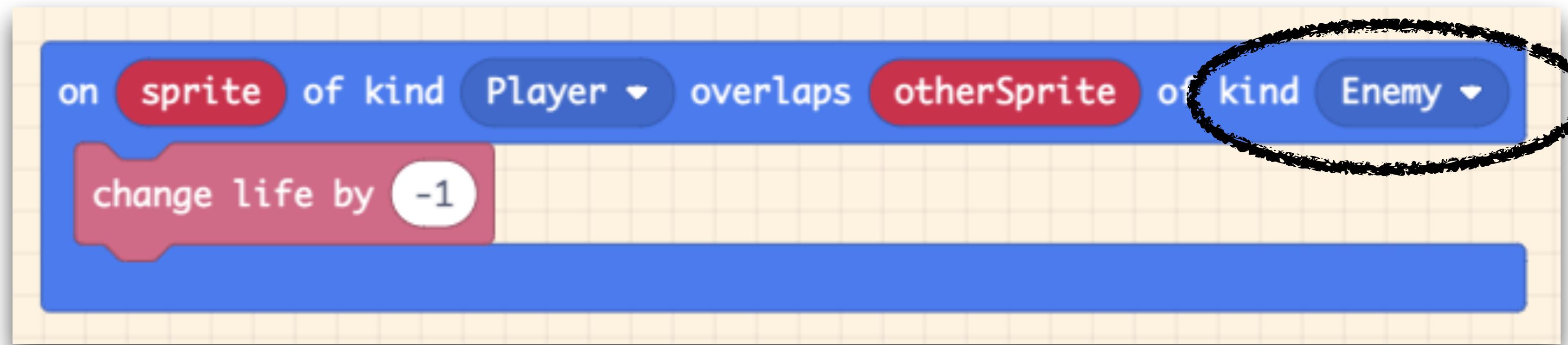
4

- Go to Sprites and drag in this code block
- Set it for your **Bee** to follow your Player (in my example, they are called Duck)

TEST YOUR GAME!

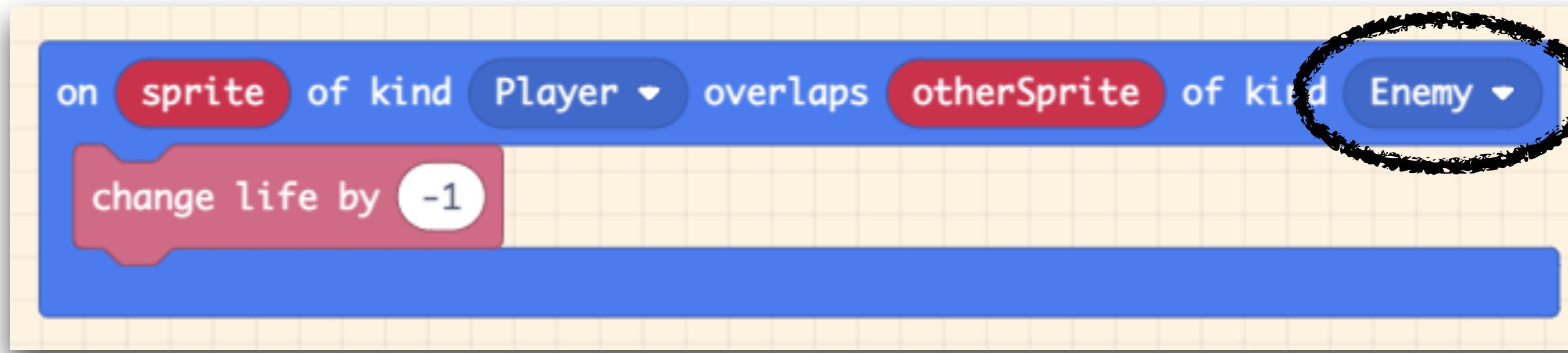
- When you overlap a flower the flower should disappear
- When you overlap a flower the bee should appear and follow you

Step 12: What happens when the Player overlaps the Bee?



- 1
 - Go to Sprites and drag in this code block
 - Set the end kind to **Enemy**
 - Go to Info and drag in the 'change life' block.. set to **-1**

Step 12: What happens when the Player overlaps the Bee?



- 2** - Go to Sprites and drag in this code block
- Set the end kind to **Enemy**
- Go to Info and drag in the 'change life' block.. set to -1



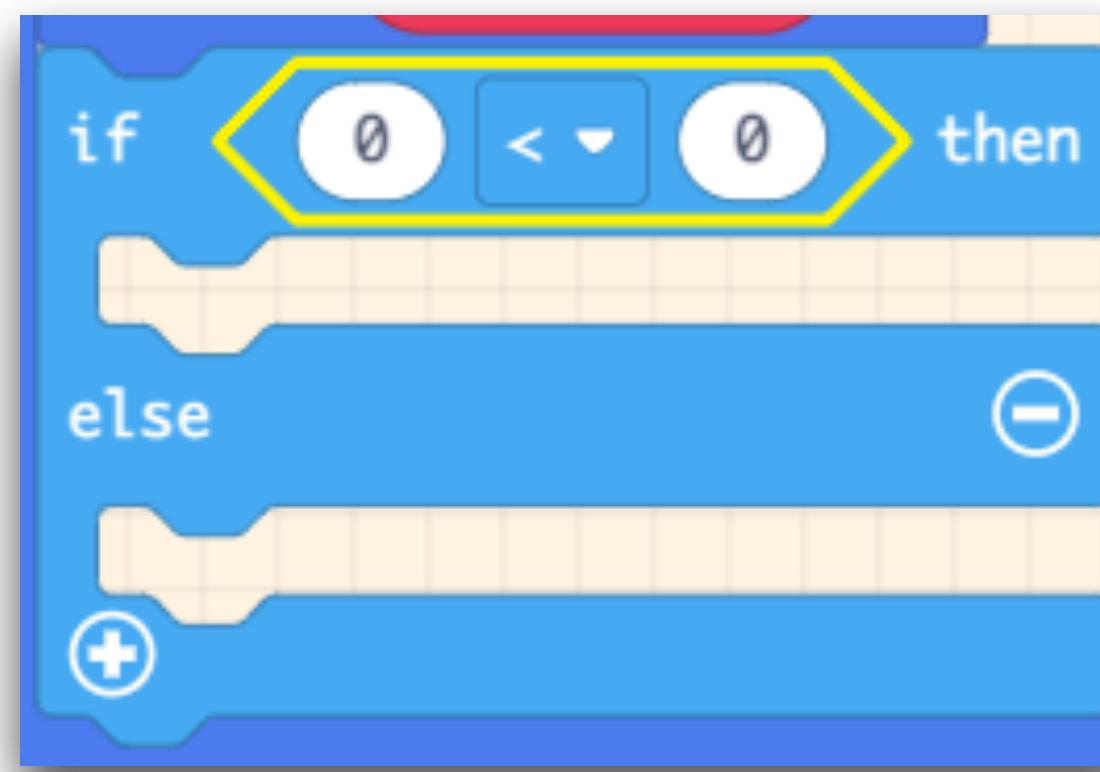
- 3** - Go to Sprites and drag in this code block
- Drag the variable otherSprite into the destroy code block

Step 12: What happens when the Player overlaps the Bee?



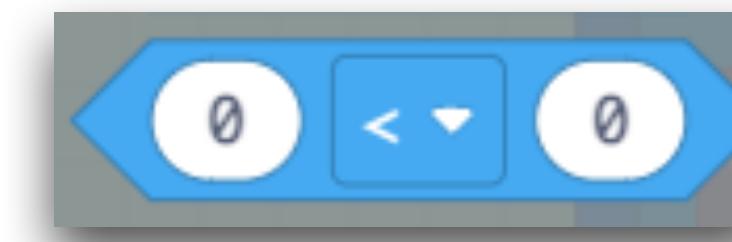
4

Go to Logic and drag in an
IF THEN ELSE block



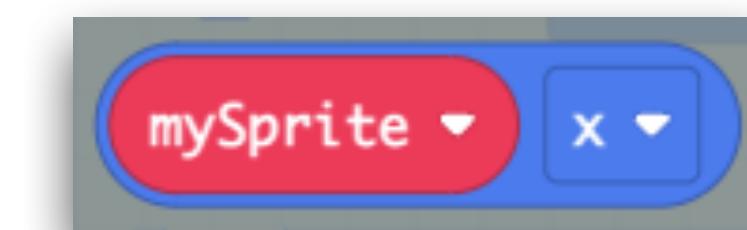
5

Go to Logic and drag in a
comparison block



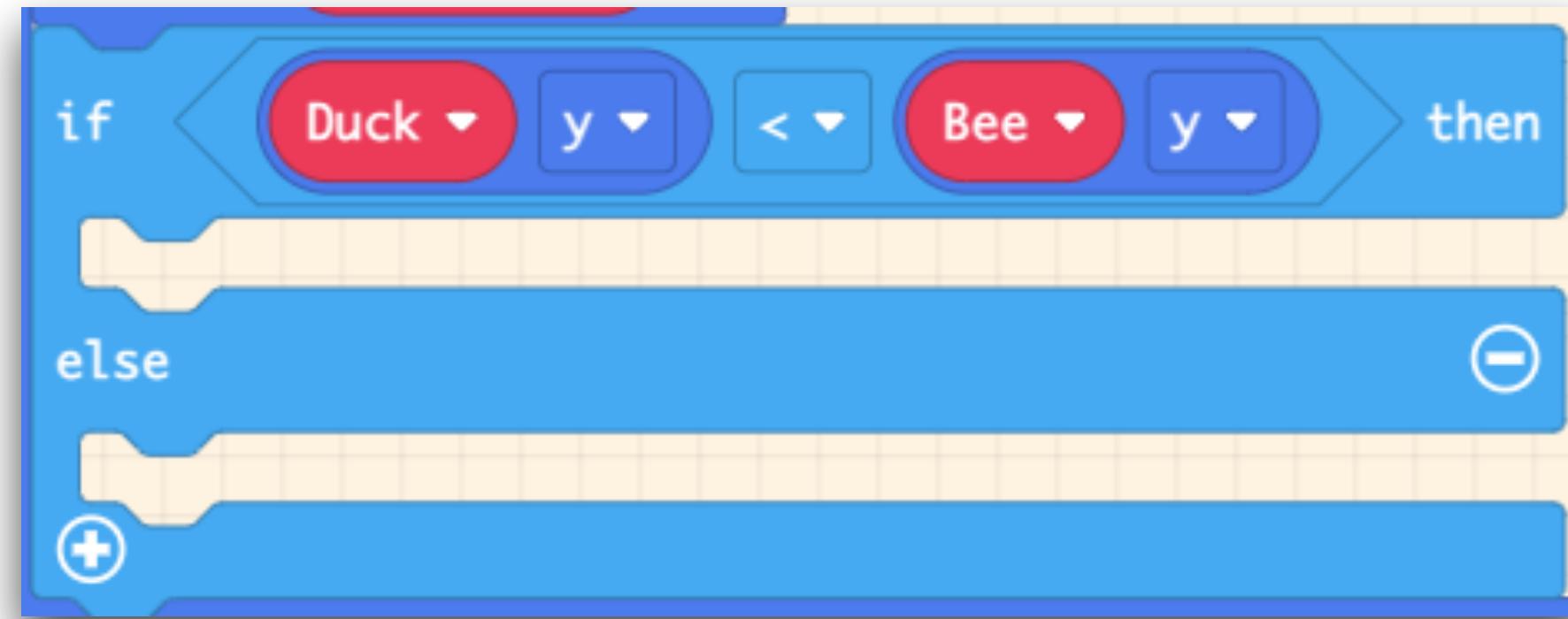
6

Go to Sprites and drag in this code block
- drop it into the comparison block



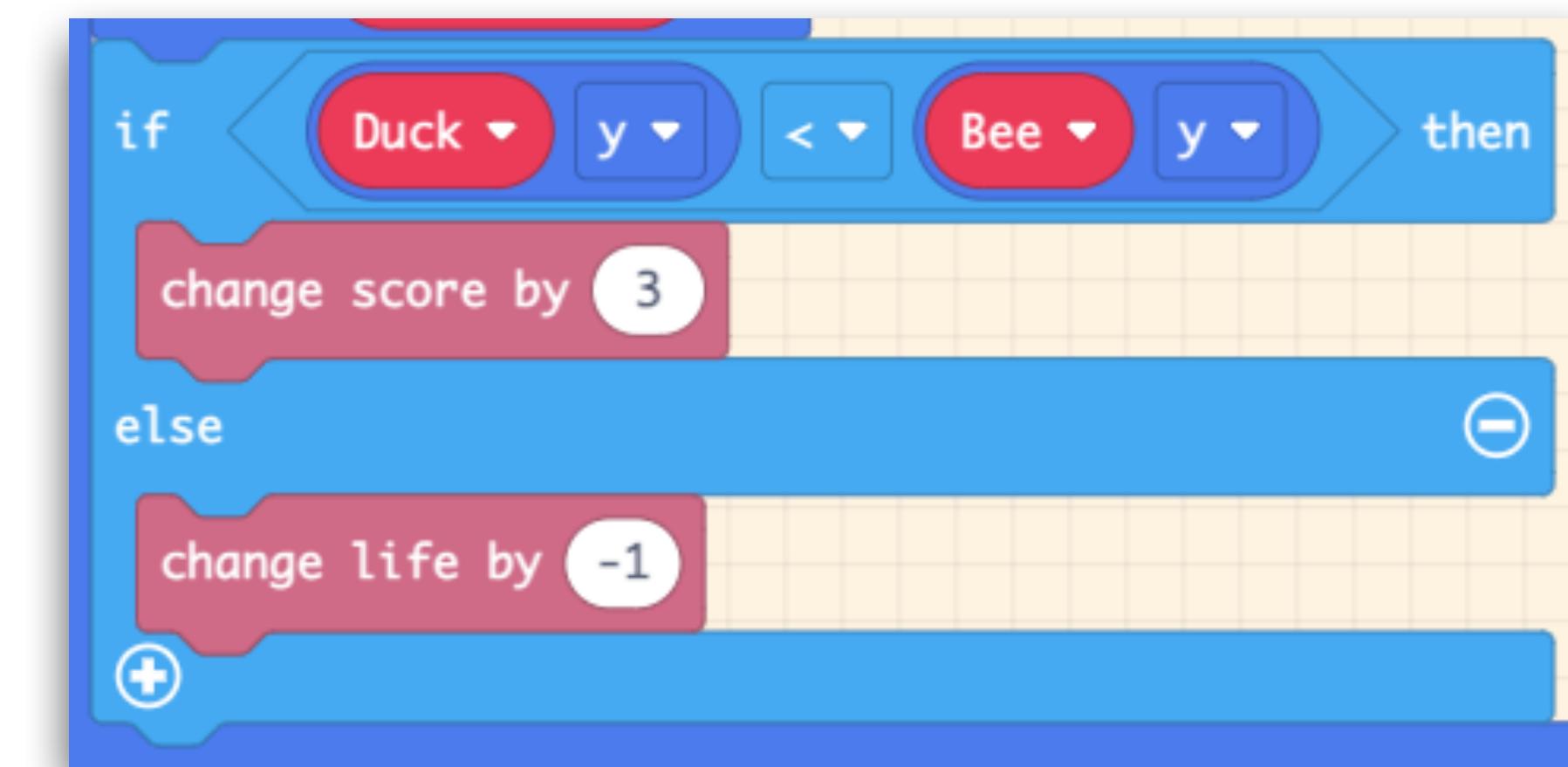
Step 12: What happens when the Player overlaps the Bee?

7



- Set the first one to your **Player**
- Second one to the **Bee**
- Make sure both are set to the value **y**

8



- Go to Info and drag in 'Change Score' for the first section
- Use your 'change life by -1' block for the second section

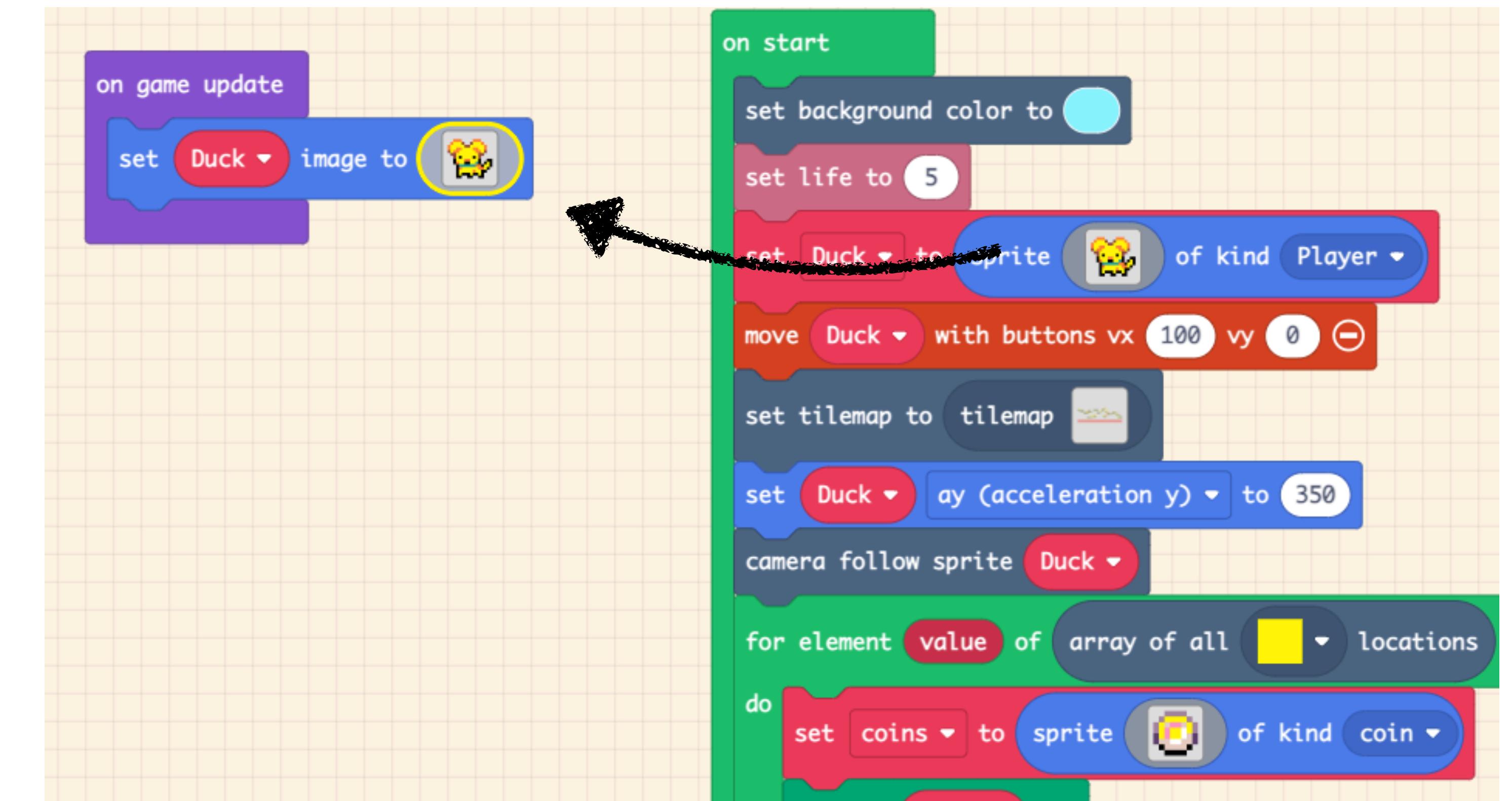
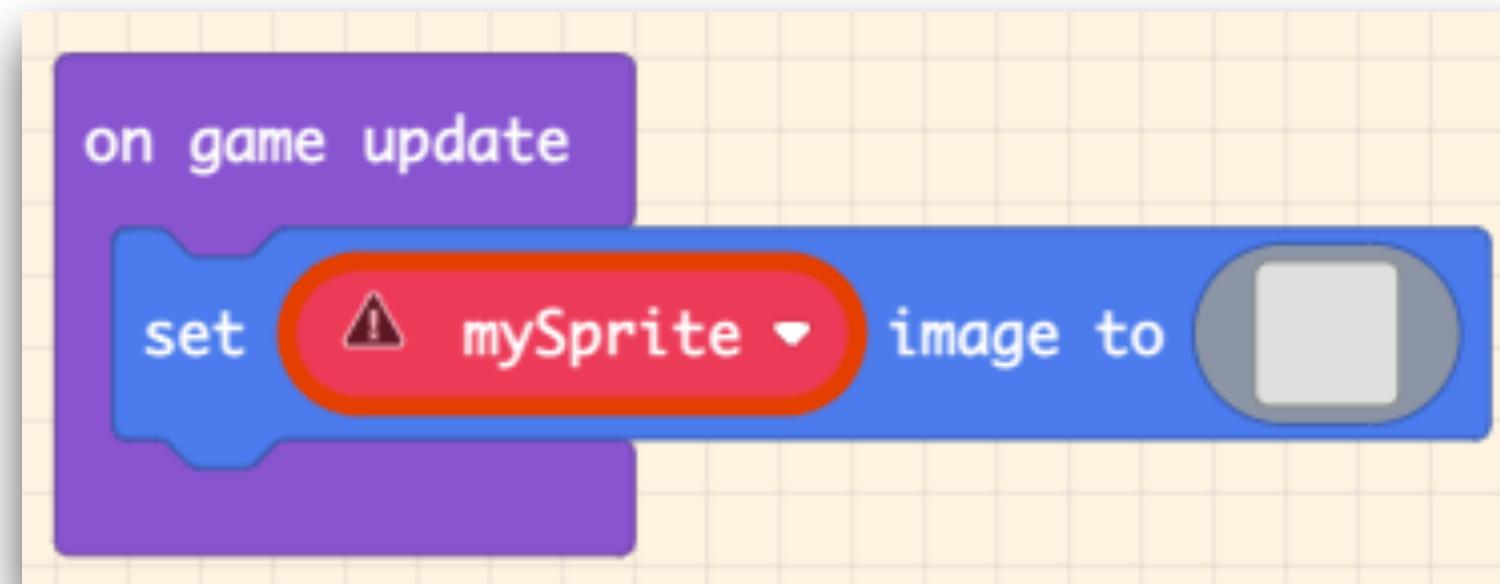
TEST YOUR GAME!

- When you jump on a bee you should get 3 lives
- When the bee jumps on you, you will lose 1 life

ANIMATION

Step 13: Animate your Player

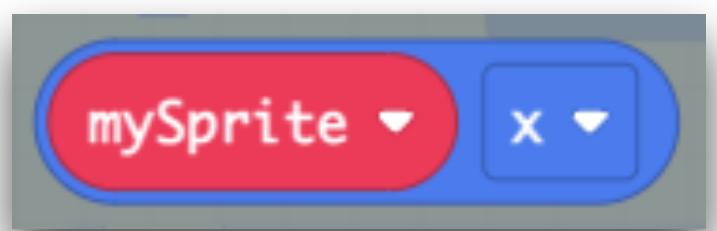
- 1 - Set the default position of your player with the following code



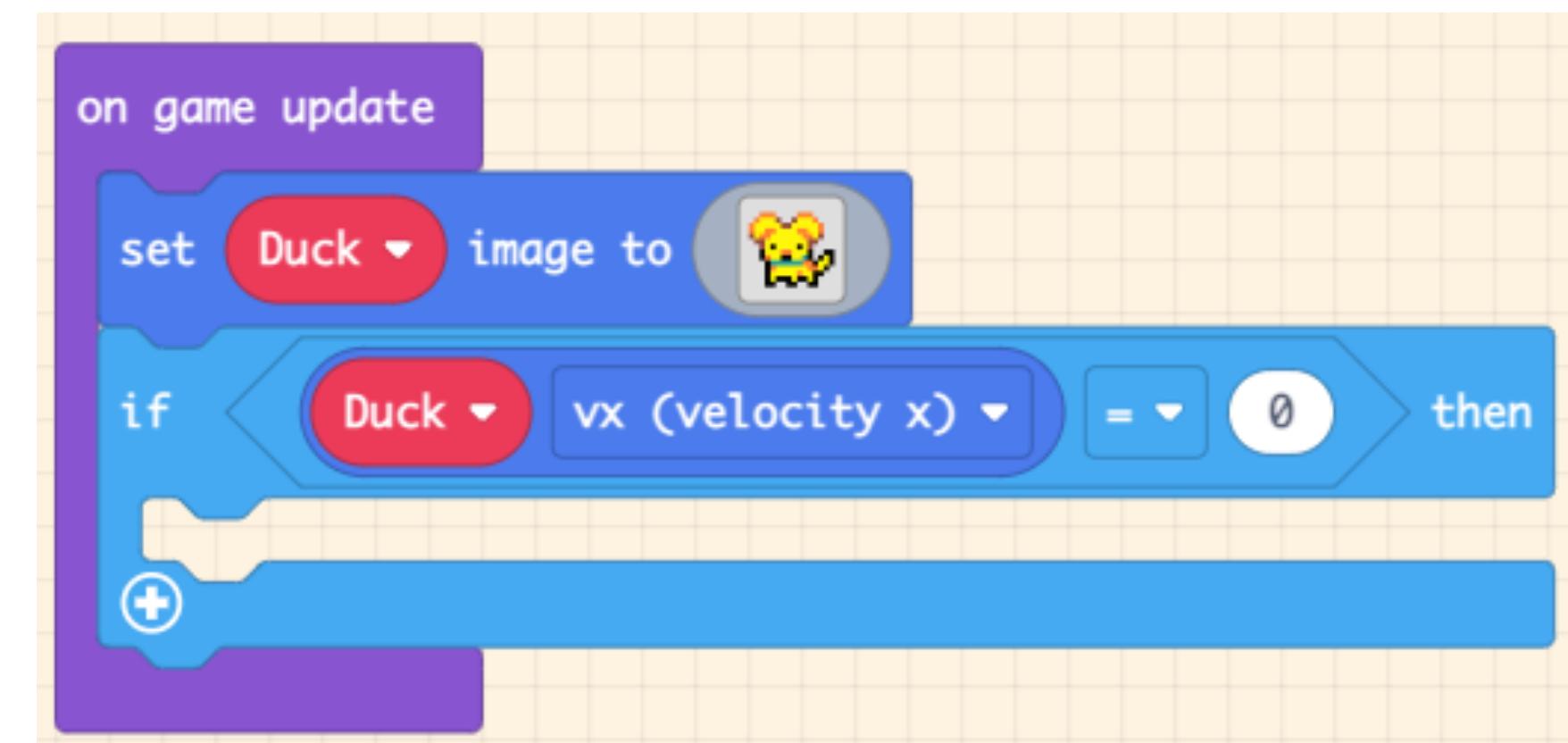
2

- Set your sprite name to your player
- Drag your player image across

Step 13: Animate your Player

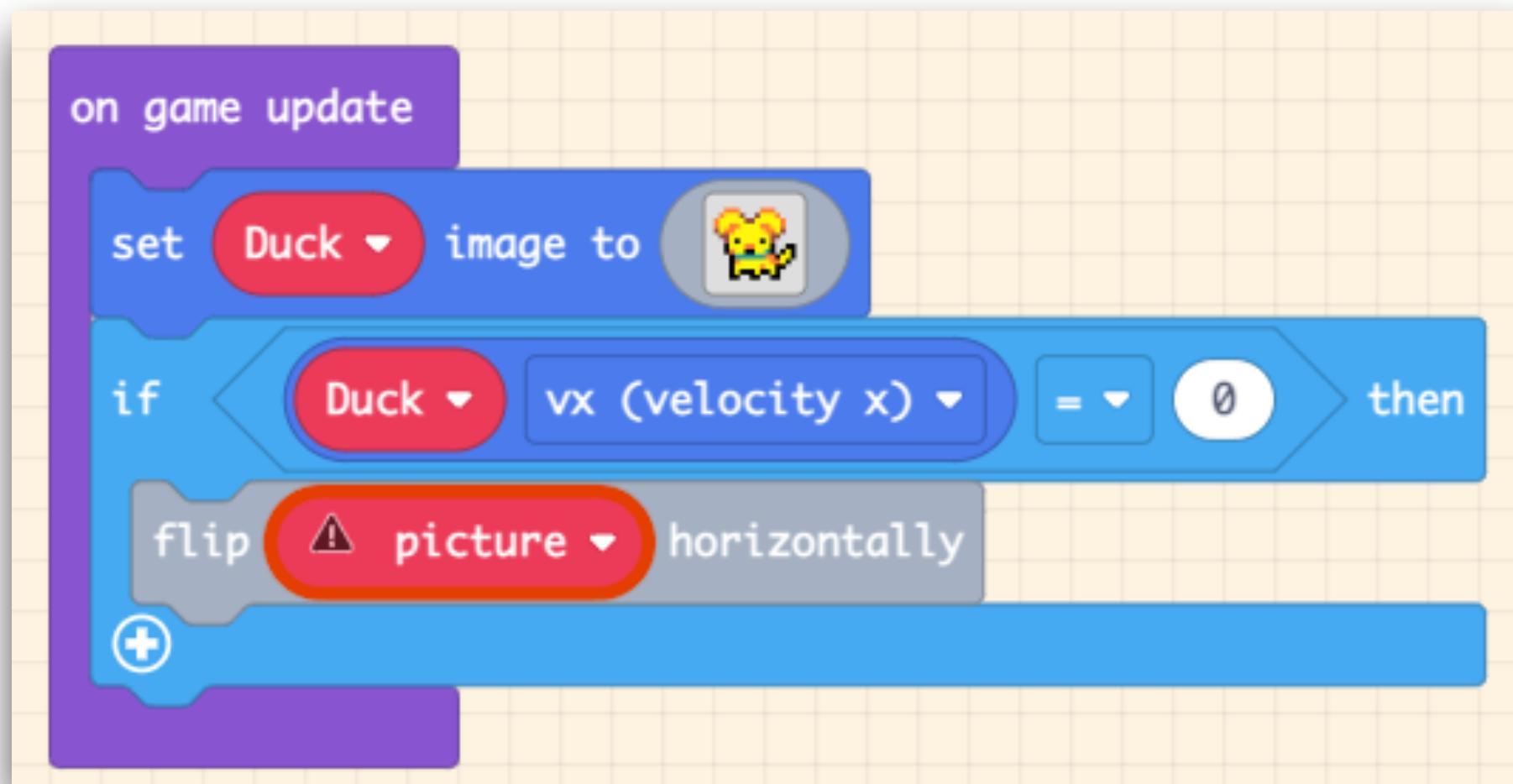


- 3**
- Go to Logic
 - Drag in an IF THEN statement
 - Drop a comparison block into the 'true' section



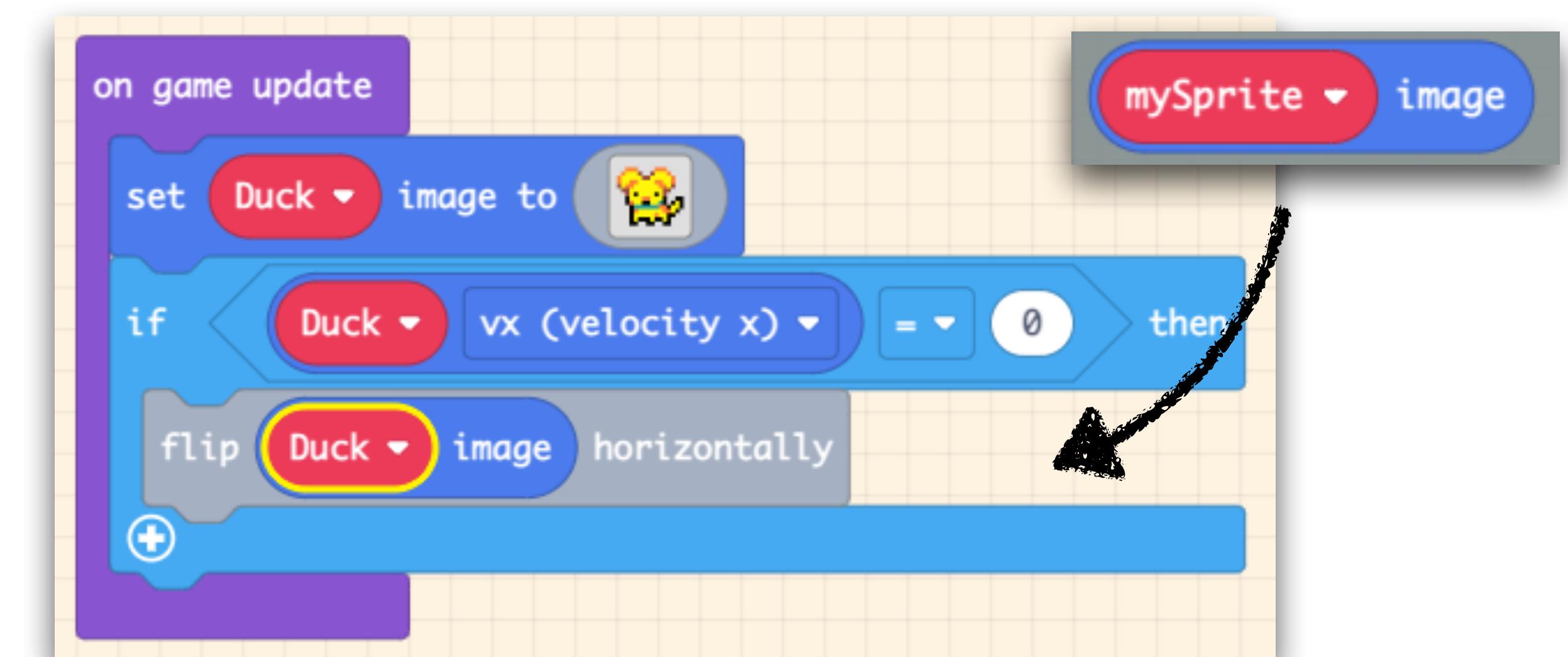
- 4**
- Drag in the my sprite code block and set to vx (velocity x)

Step 13: Animate your Player



5

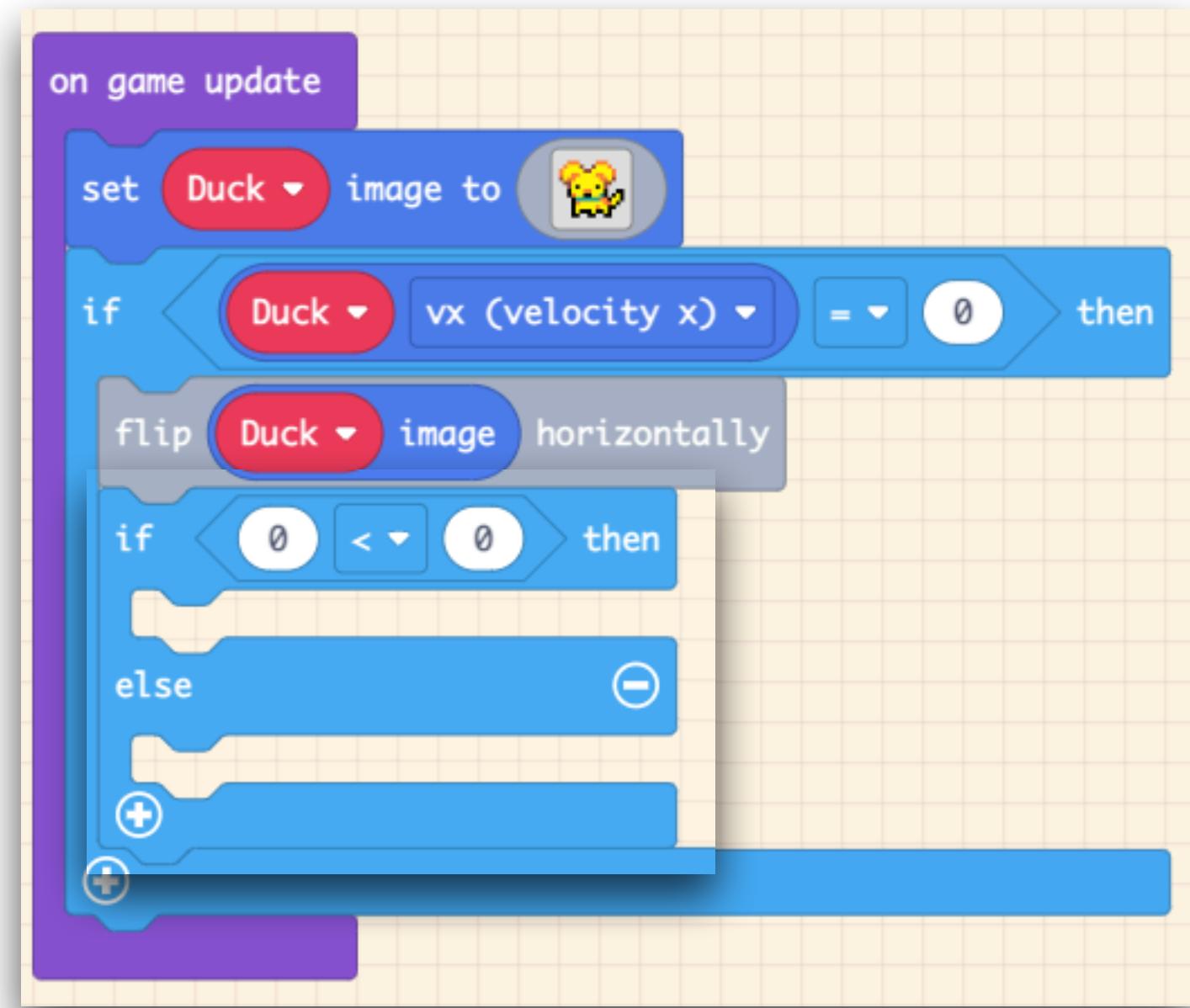
- Go to Advanced > Images
- Drag this code block



6

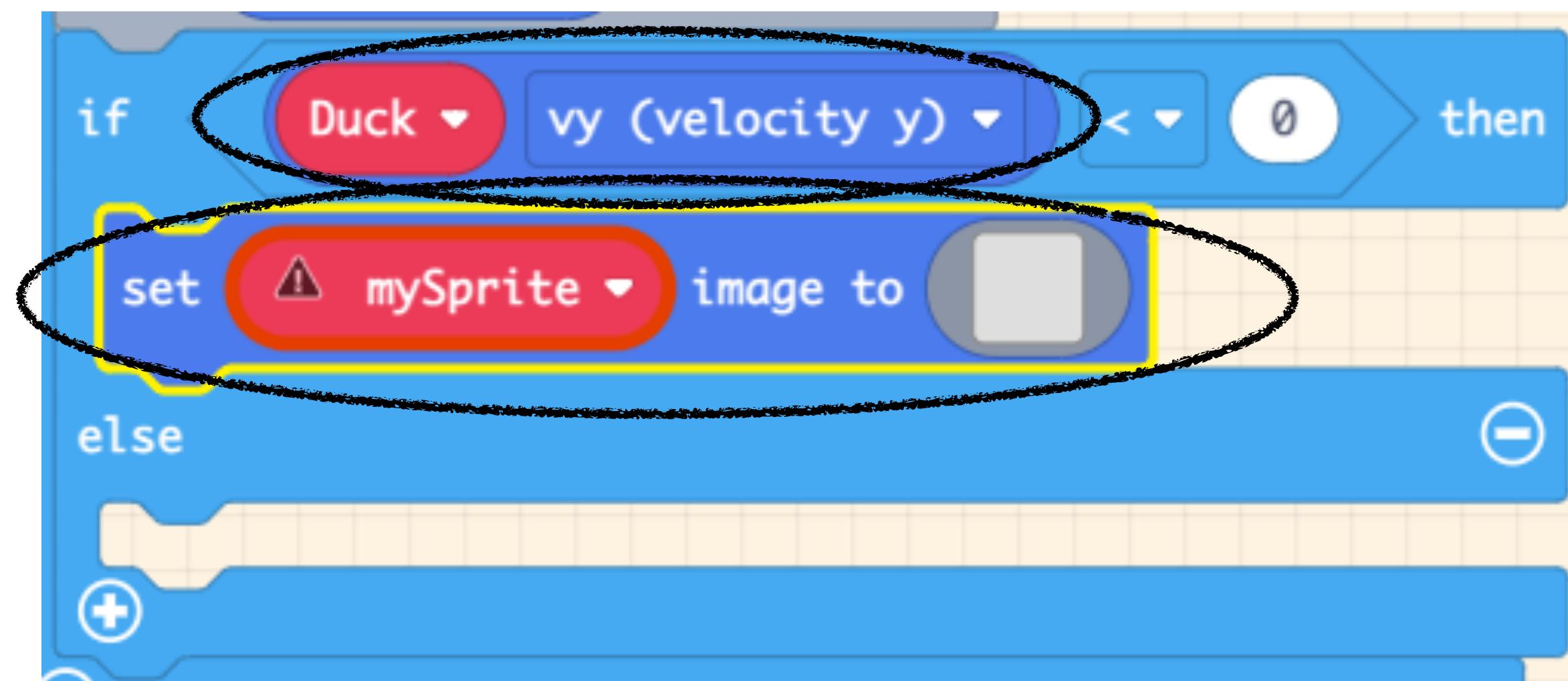
- Go to Sprites and drag in this block to drop into the flip image code

Step 13: Animate your Player - jump



7

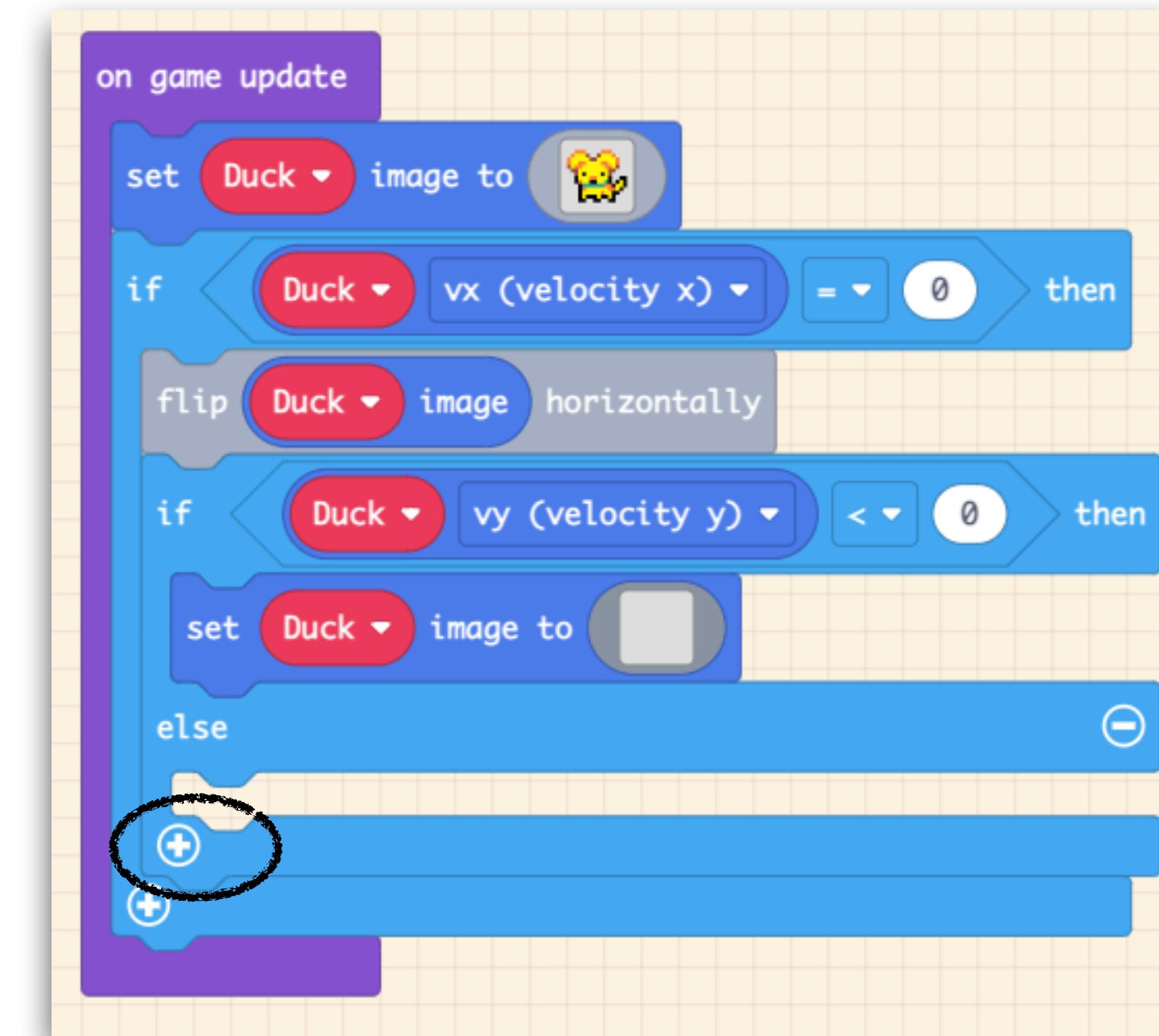
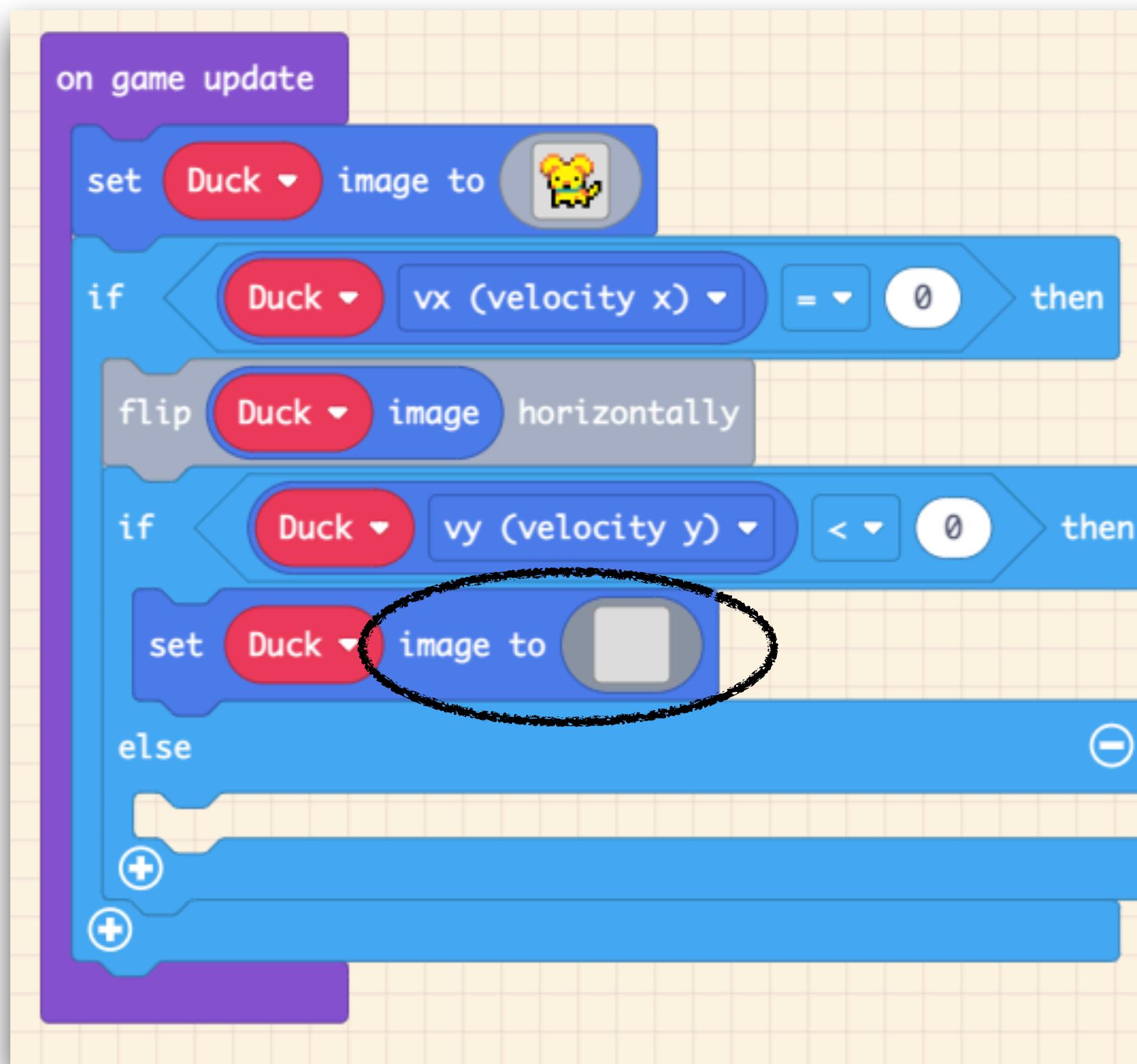
- Go to Logic
- Drag in an **IF THEN ELSE** statement
- Drag in a **< Comparison** and drop it into the 'true' section



8

- Can you find the following code blocks in the Sprites menu and drag them into position?

Step 13: Animate your Player - jump



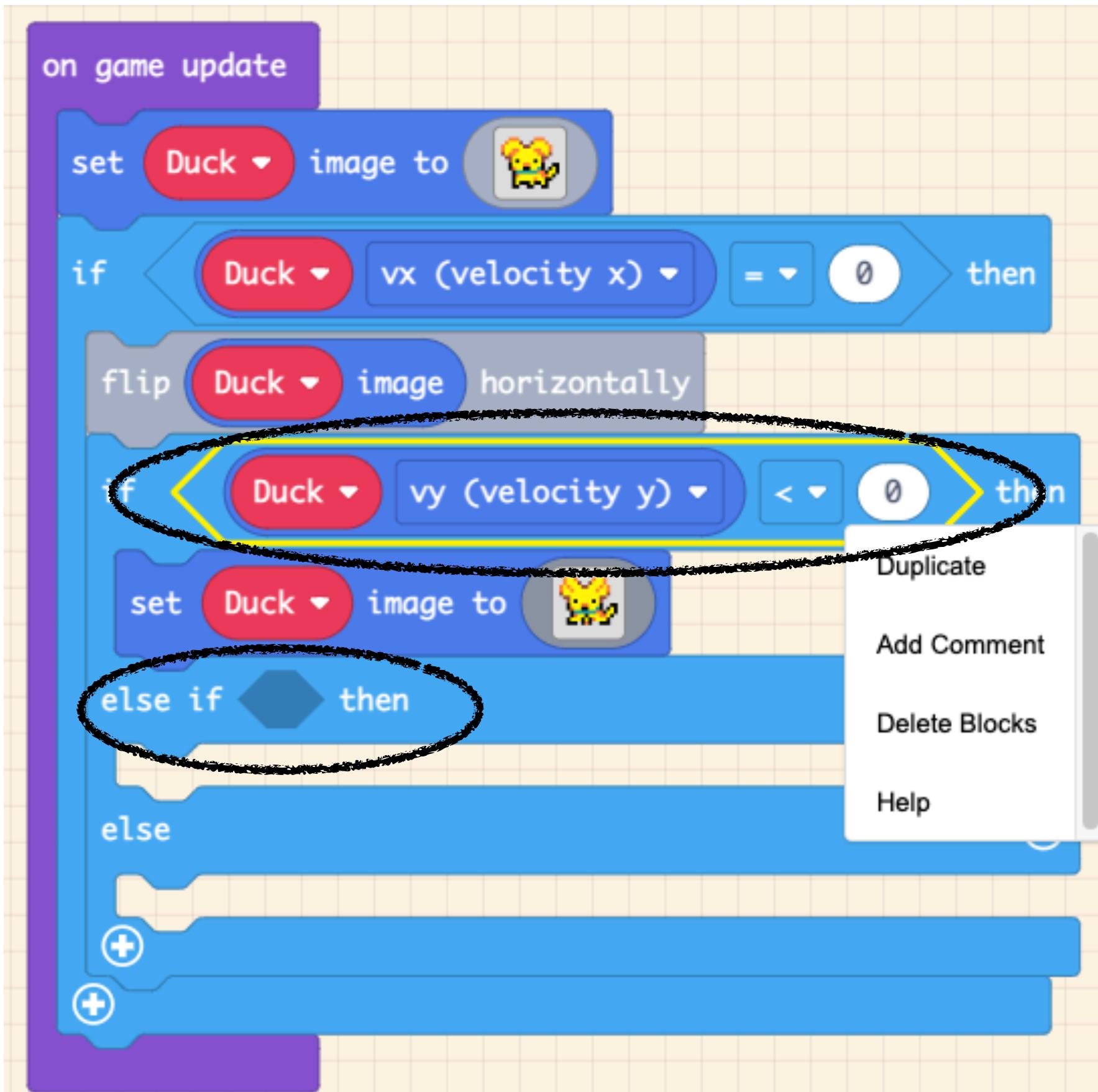
9

- Click on the tile and draw your sprite **jumping!**

10

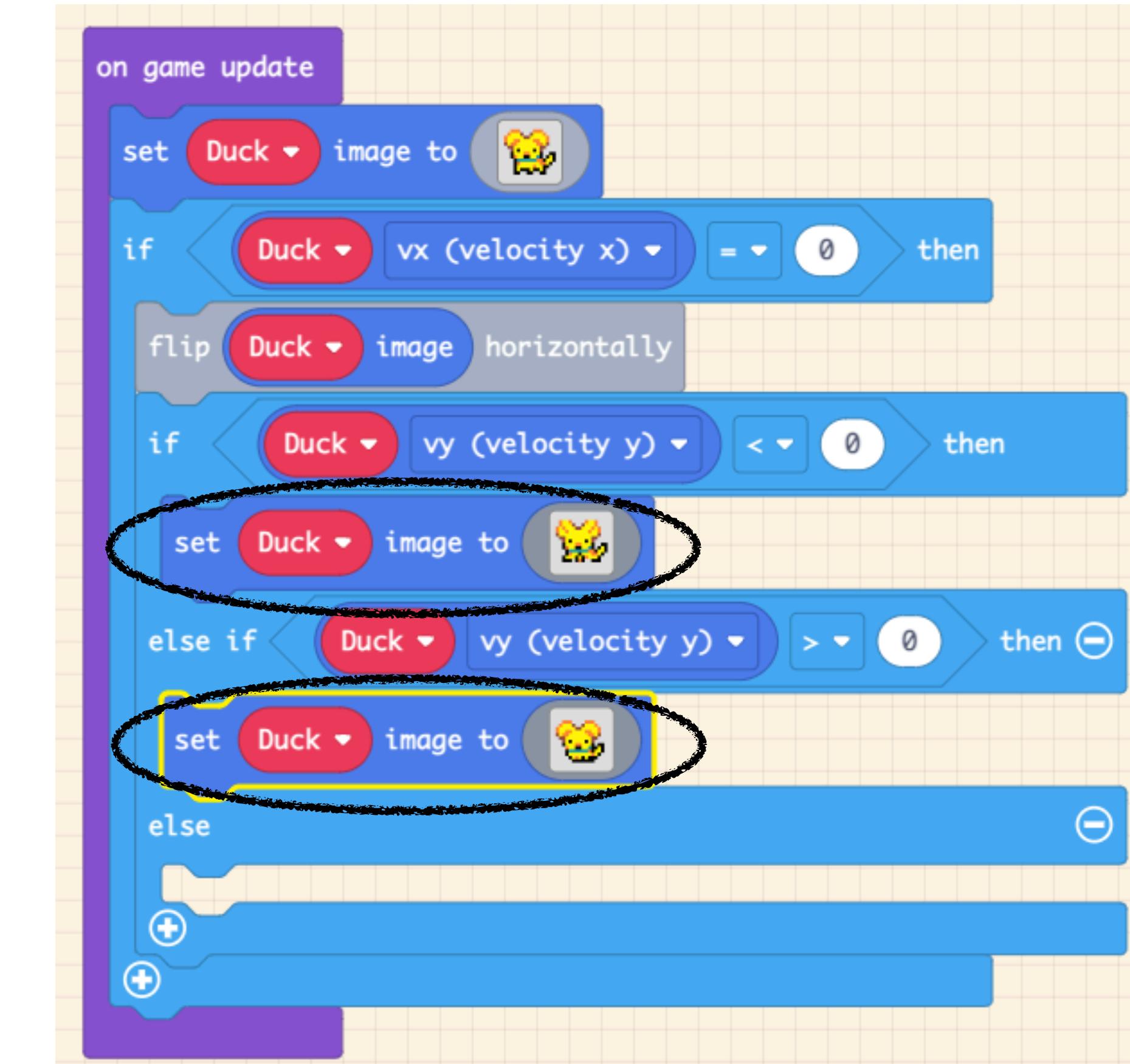
- Click the + icon to create an ELSEIF statement

Step 13: Animate your Player - jump & fall



11

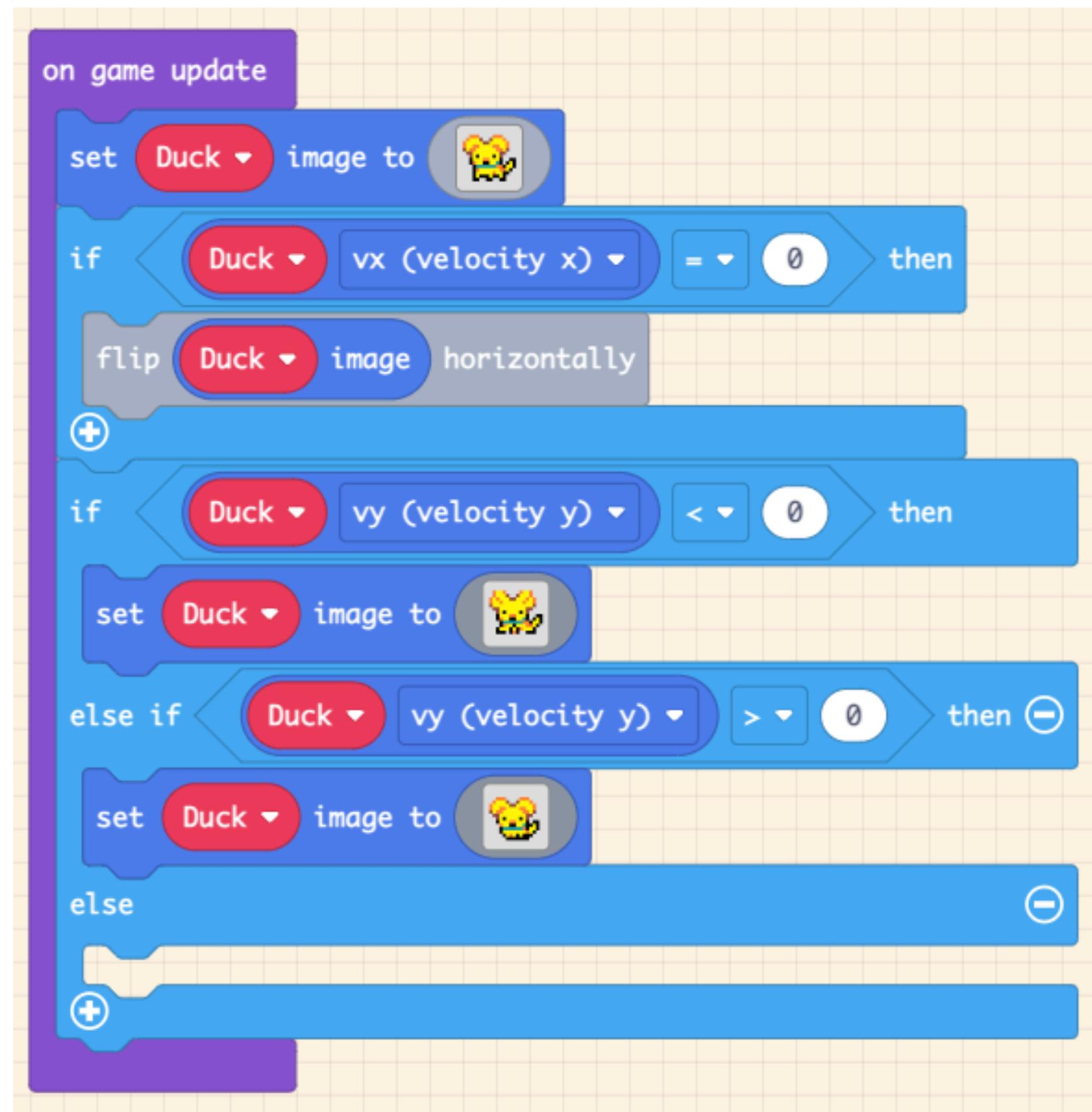
- Right click on the code in the first circle and **duplicate**
- Drag the code into the next else if statement



12

- Duplicate the code of your jumping sprite and drag into your new elseif statement
- Click on the tile and draw your sprite **falling**

Step 13: Animate your Player - jump & fall

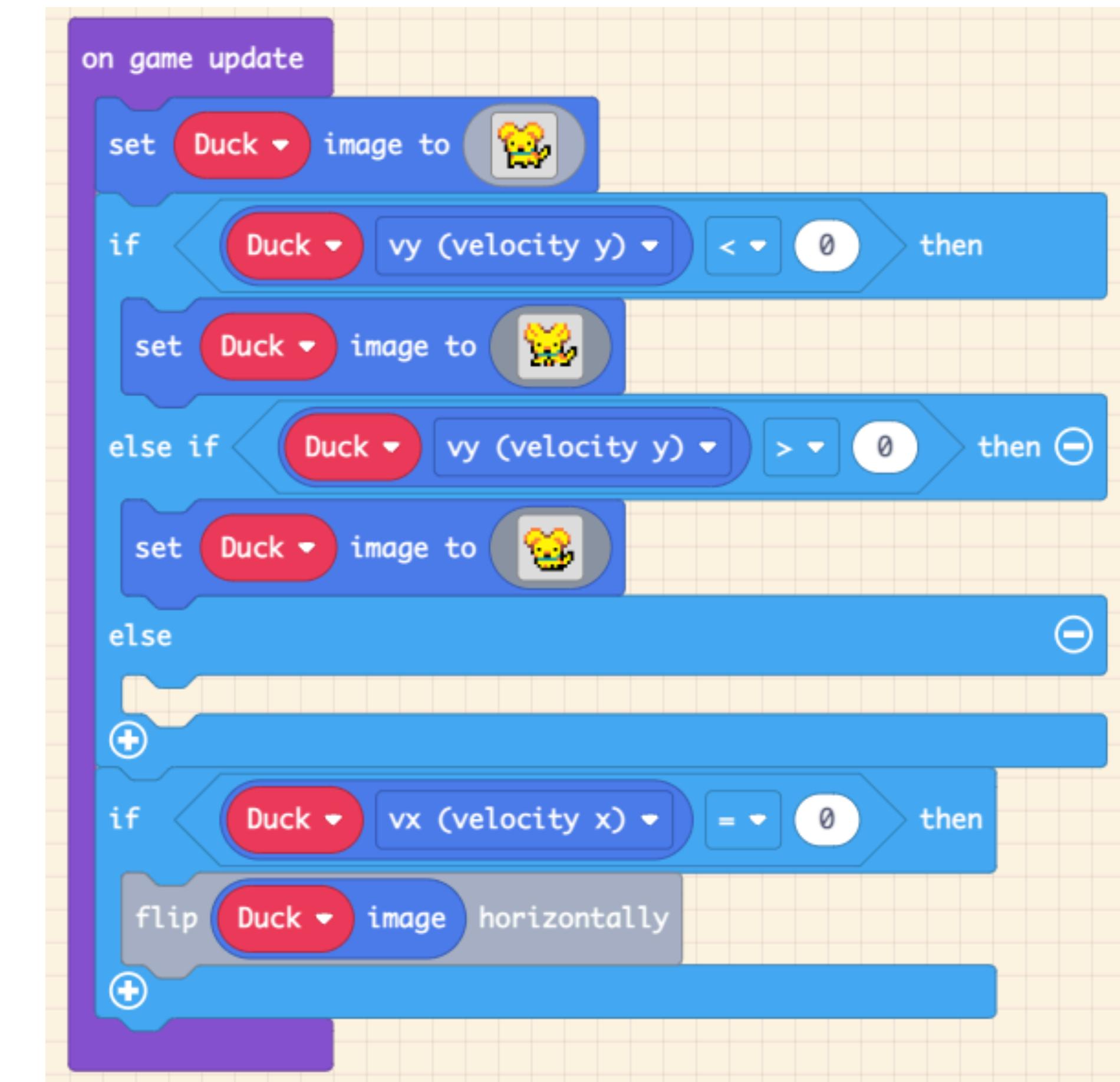


13

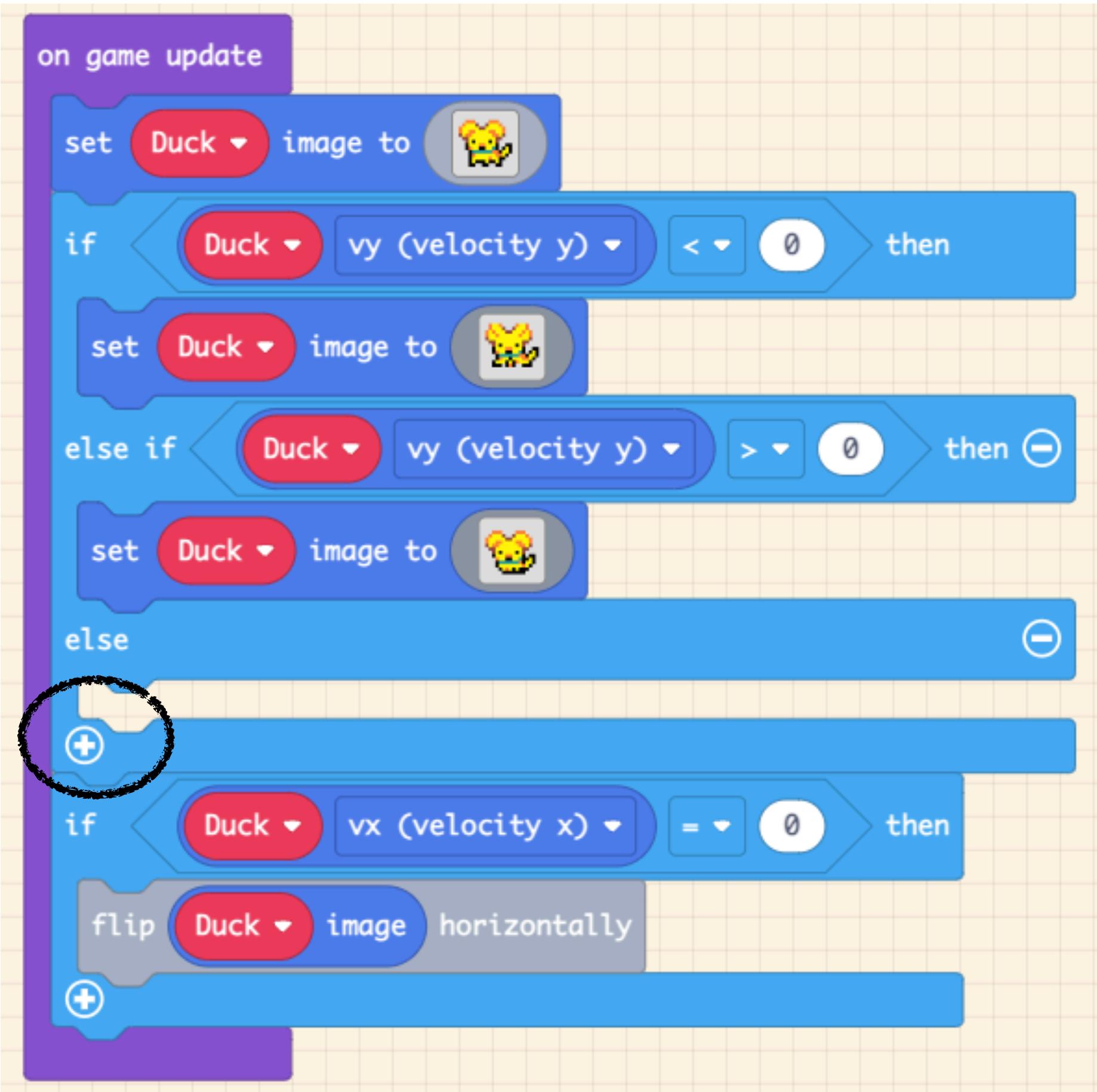
- Grab Emma to explain this section: we need to drag your if else statements outside of the first IF Statement

14

- Move your first IF Statement where your sprite flips horizontally, to the bottom. This will make your player be able to face the other way even when they are mid-jump or mid-fall



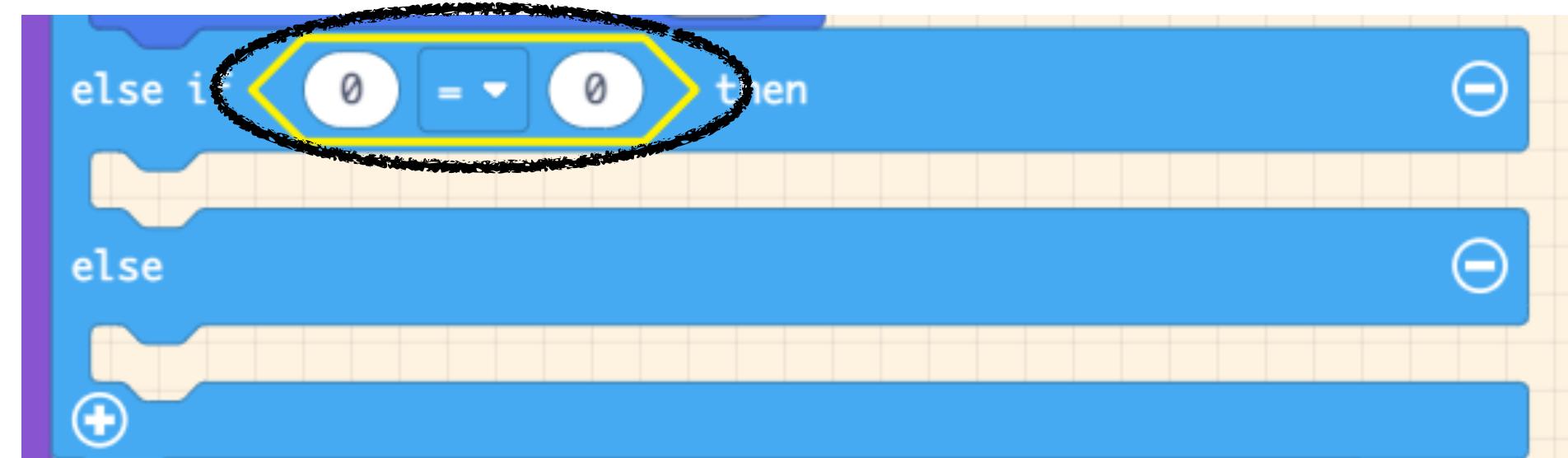
Step 13: Animate your Player - make the legs move



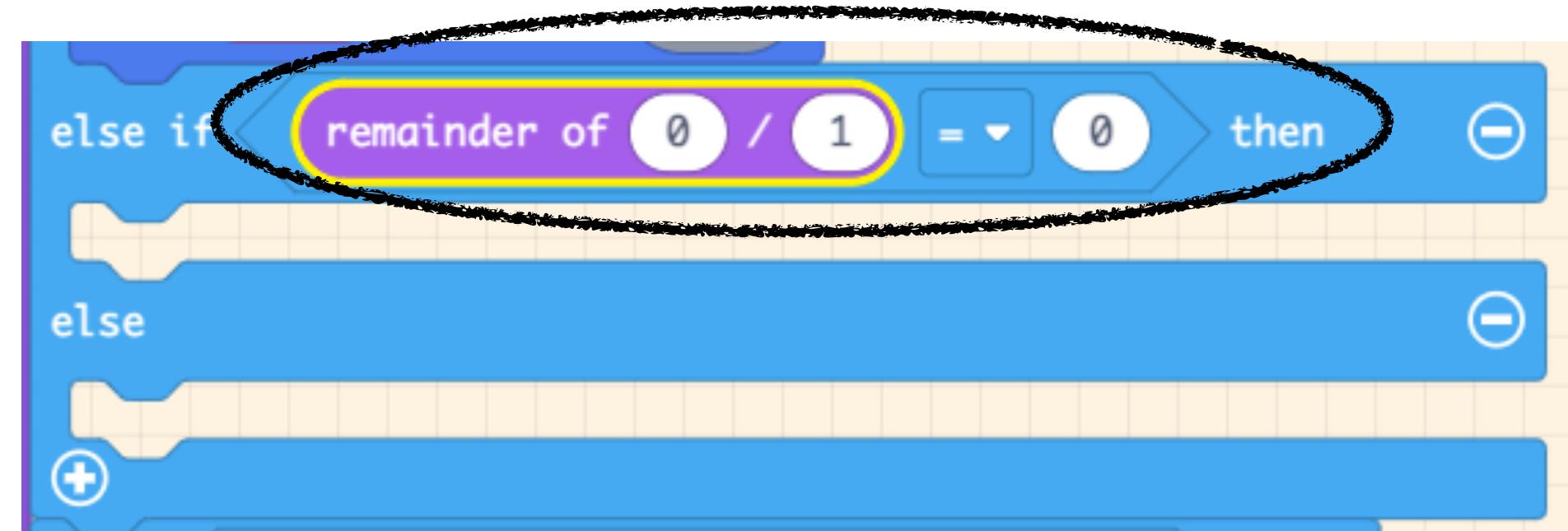
15

- Grab Emma to explain this section: we need to drag your if else statements outside of the first IF Statement

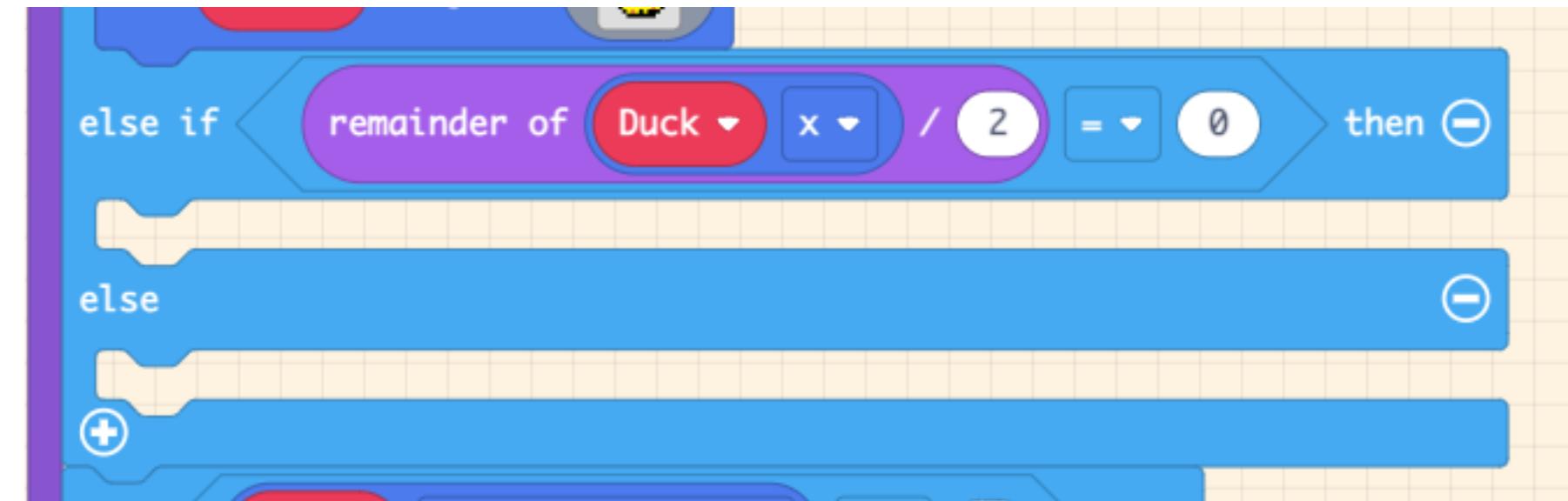
16



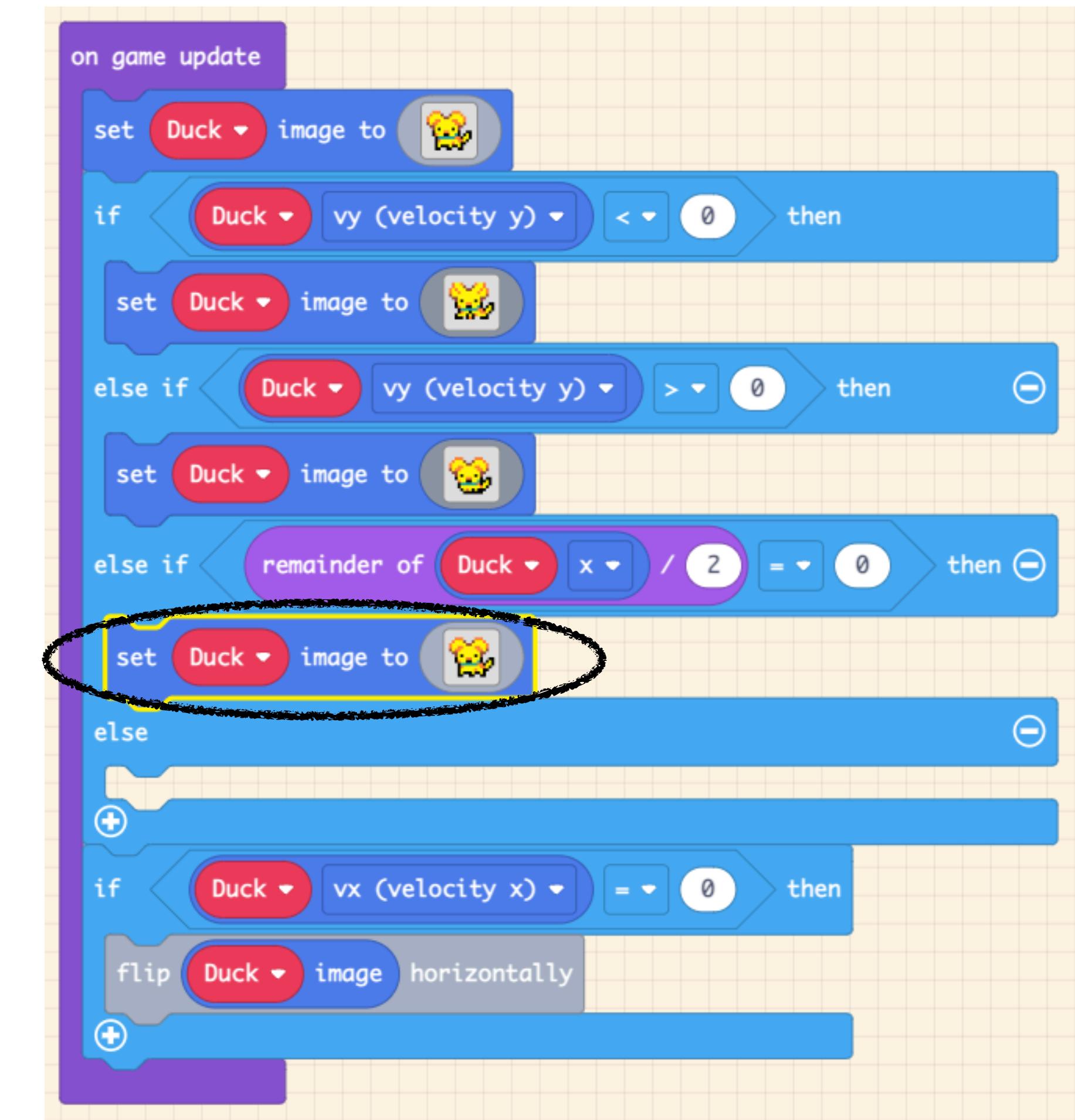
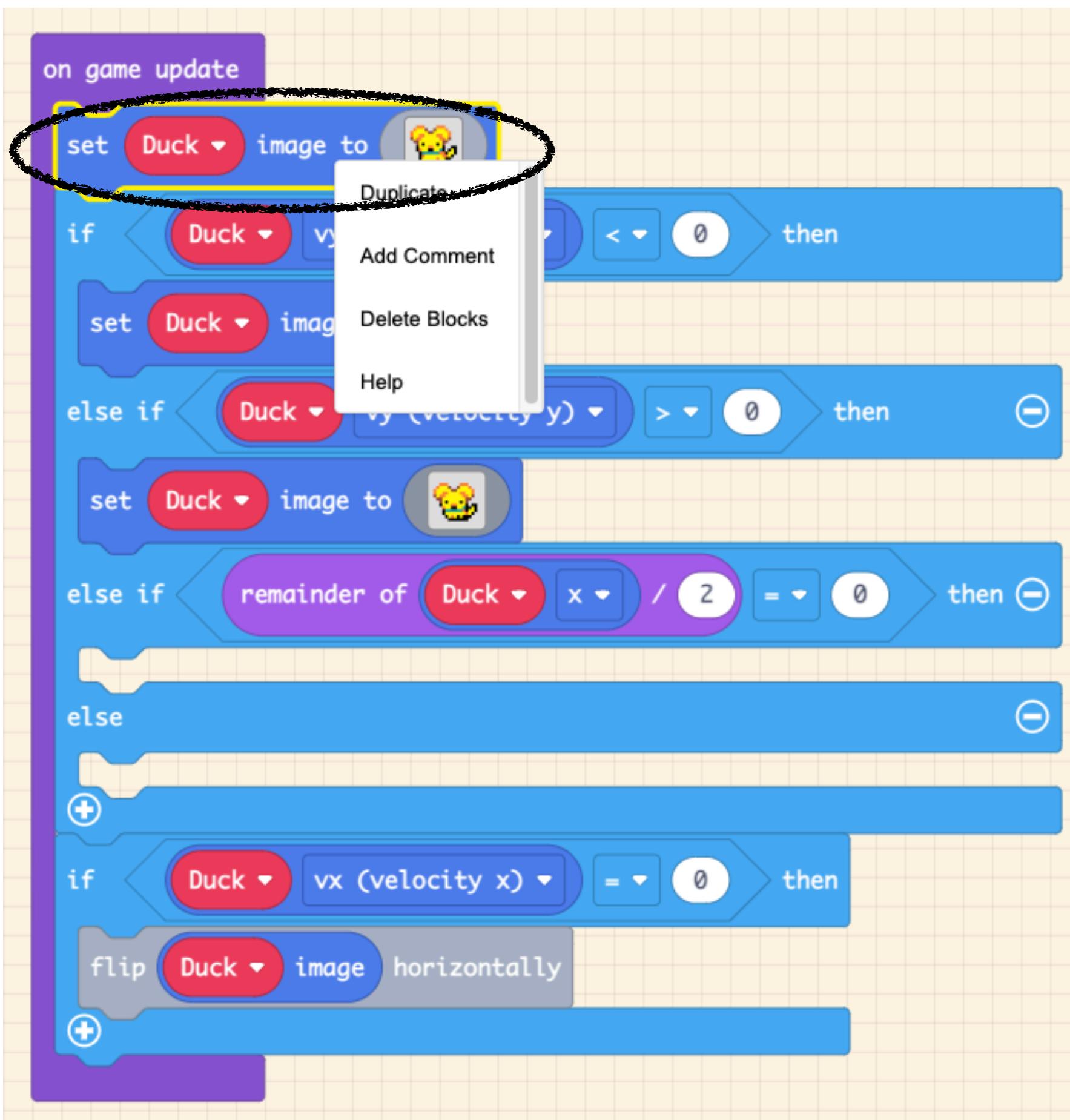
17



18



Step 13: Animate your Player - make the legs move



19

- Right click over the top 'set image' and duplicate

20

- Drag to your new else if statement
- Click on the tile and draw your character with their legs in a different position (legs closer together)
- This will give the effect of them walking

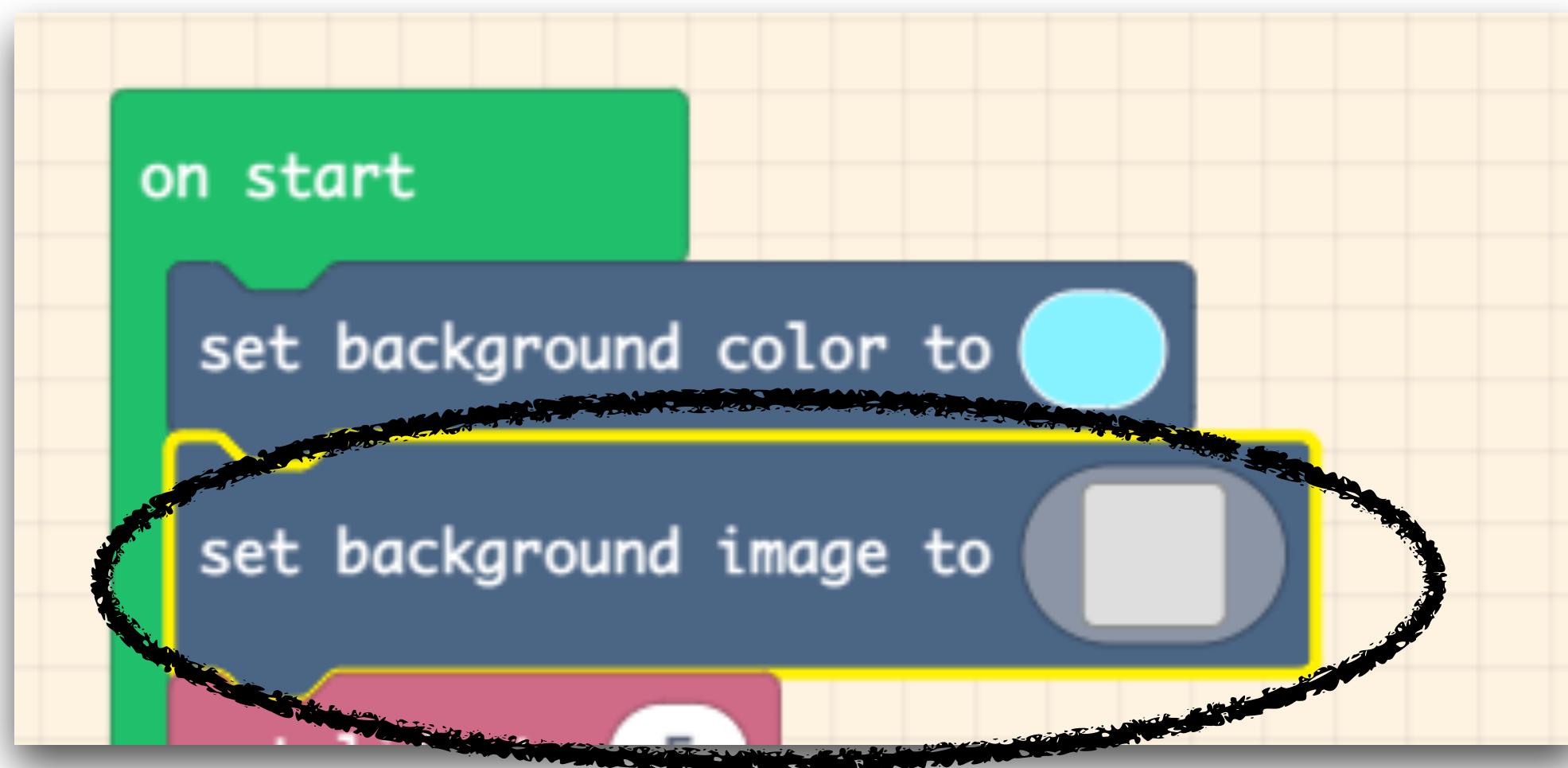
TEST YOUR GAME!

- Your Player should animate whenever you move it!

SPAWN POINTS

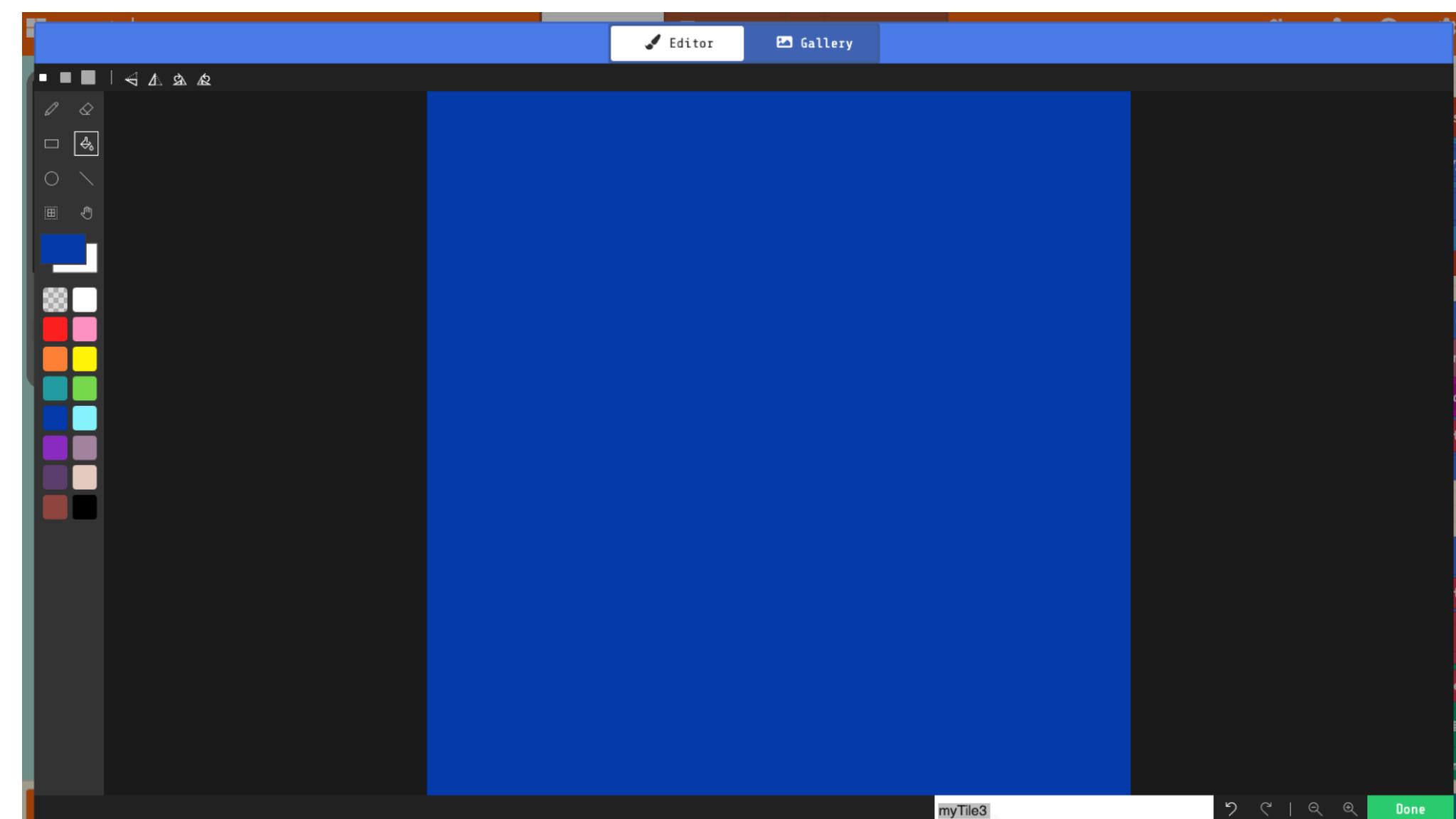
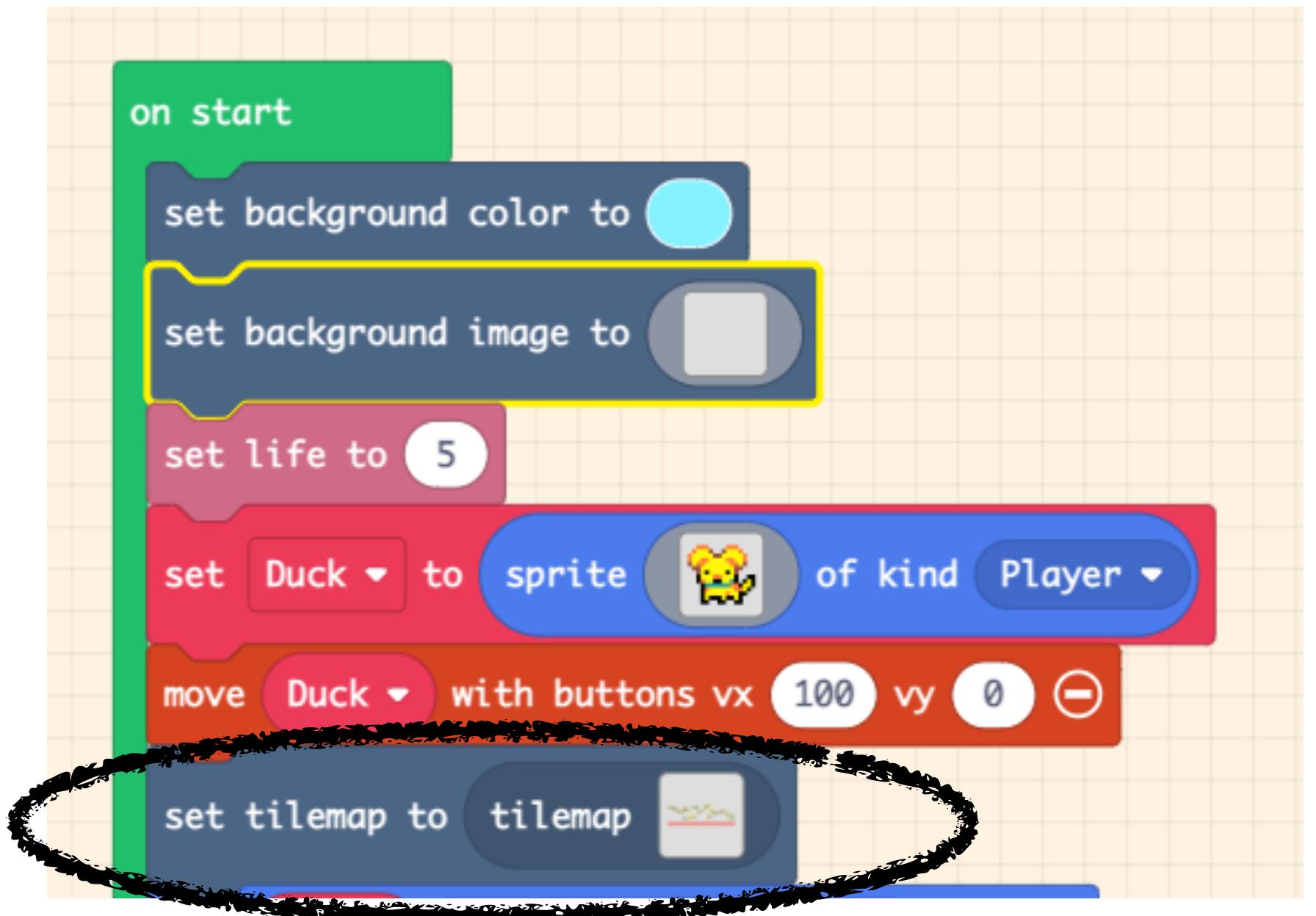
Step 14: Make your game look better with a detailed background

- 1 - Drag this at the top of your ON START code then click the tile and draw a cool background



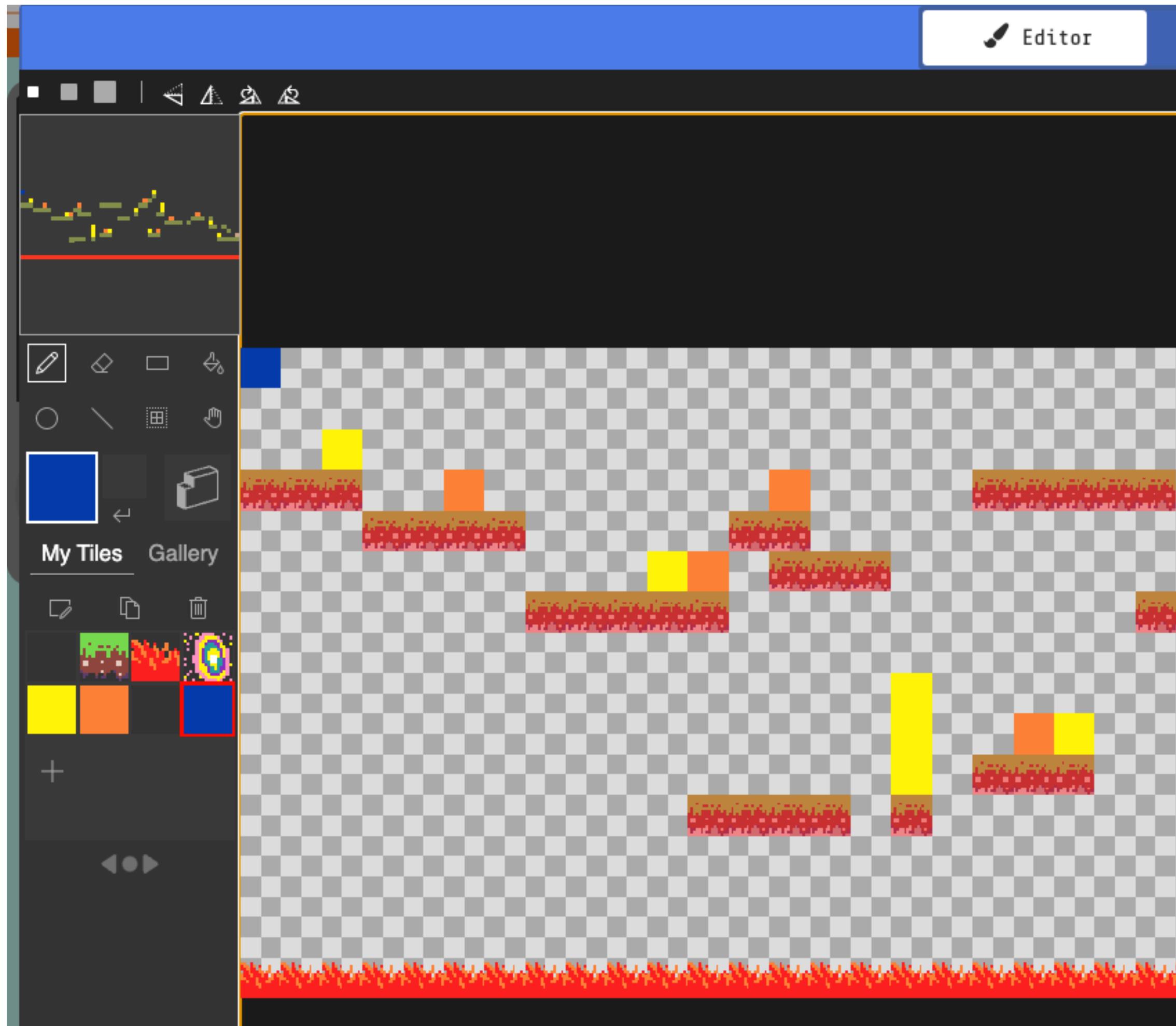
Step 15: Spawn from the sky

- 1 - Open your Tile Map, create a new BLUE tile



Step 15: Spawn from the sky

- 2 - Draw a blue tile in the sky at the beginning

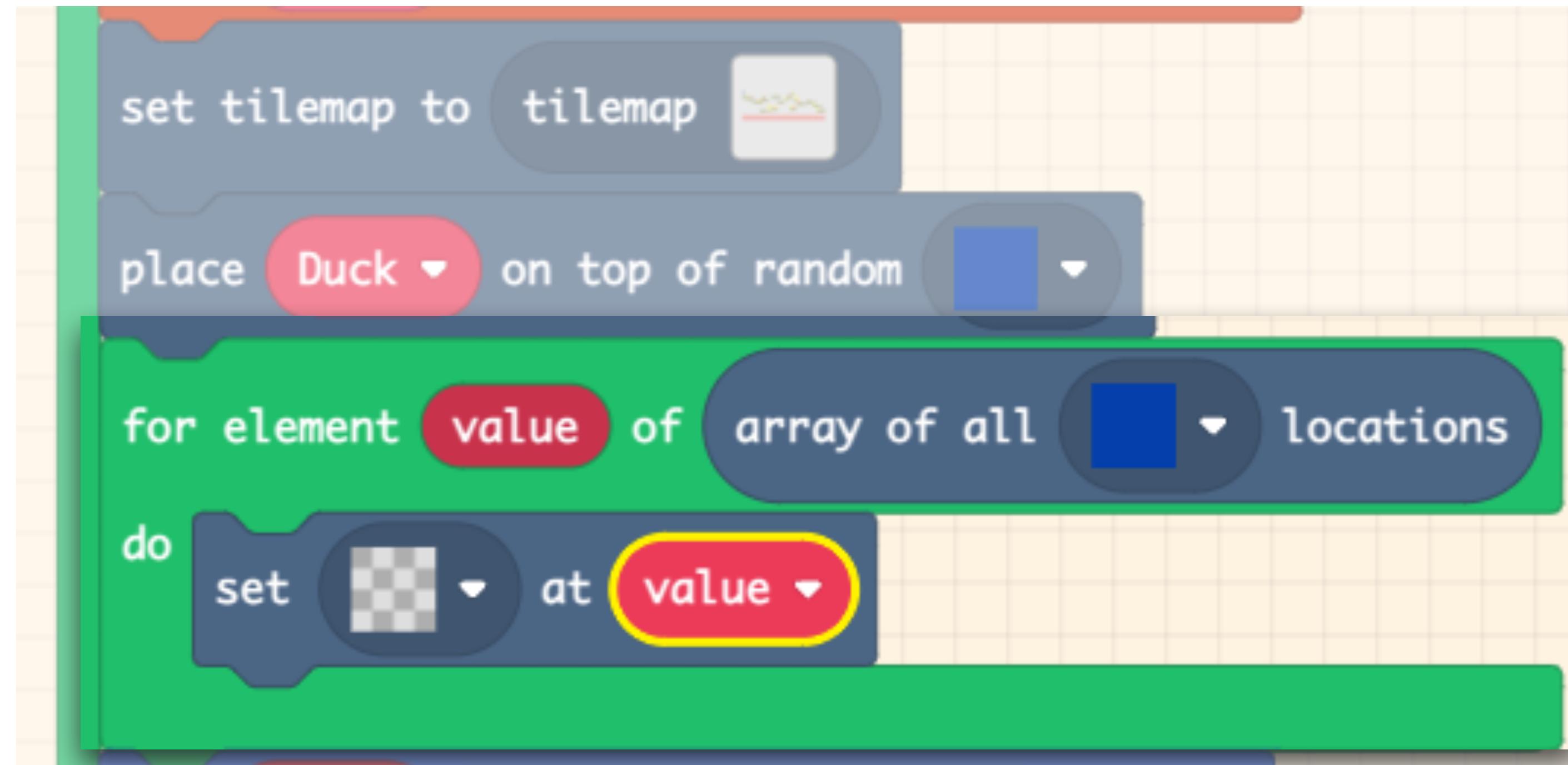


```
on start
    set background color to [light blue]
    set background image to [sky]
    set life to [5]
    set [Duck] to sprite [Player] of kind [Player]
    move [Duck] with buttons vx [100] vy [0]
    set tilemap to [tilemap]
    place [Duck] on top of random [blue]
```

- 3 - Drag in code block - select your player and the colour of your spawn tile

Step 15: Spawn from the sky

- 4 - Challenge: Copy the code below and place it underneath the code you have just completed



TEST YOUR GAME!

- Your Player should spawn from the blue tile point

NEW LEVELS

Have you finished?

Why don't you try to add some extra bits on your own!

Here are the next steps:

- Create new levels