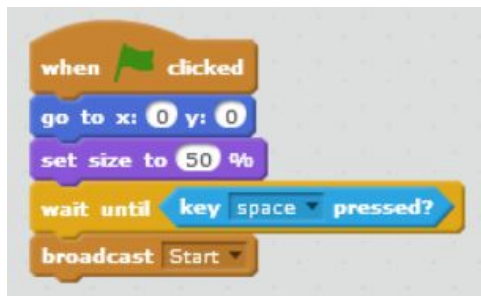


Lesson 3 - Flappy Bat

1. Make your bat fly:

- a. Start a new Scratch program and delete the cat sprite (right click>delete or scissor button).
- b. Add a background:
 - i. Click **Choose a backdrop from library** and select the woods backdrop
- c. Add the bat sprite:
 - i. Click **Choose sprite from library**.
 - ii. Find and select Bat1 (look under Animals).
- d. Add the code:
 - i. Initialize the bat with the following code: (On the broadcast script, you'll need to click the dropdown and create a new message called "Start")



1. Description:

- a. Start game when the green flag is clicked.
 - b. Center the bat in the screen.
 - c. Shrink the bat so it's not too big for the game.
 - d. We don't want the bat to start flying until the spacebar is pressed.
 - e. Once the spacebar is pressed, send a message to start the game and the bat movements.
- ii. Make the bat flap its wings:
1. Add the following code as a separate code block in the scripts space:



2. Description:

- a. When the start message is received, start flapping.
- b. Repeat forever: switch costumes and wait 0.15 seconds to create the flapping illusion. (If you go into the bat's

costumes tab, you'll see two costumes. One with the wings down and the other with the wings up. Switching between these will make the bat look like it's flying. You need a short pause between costumes, otherwise it switches too fast to see.)

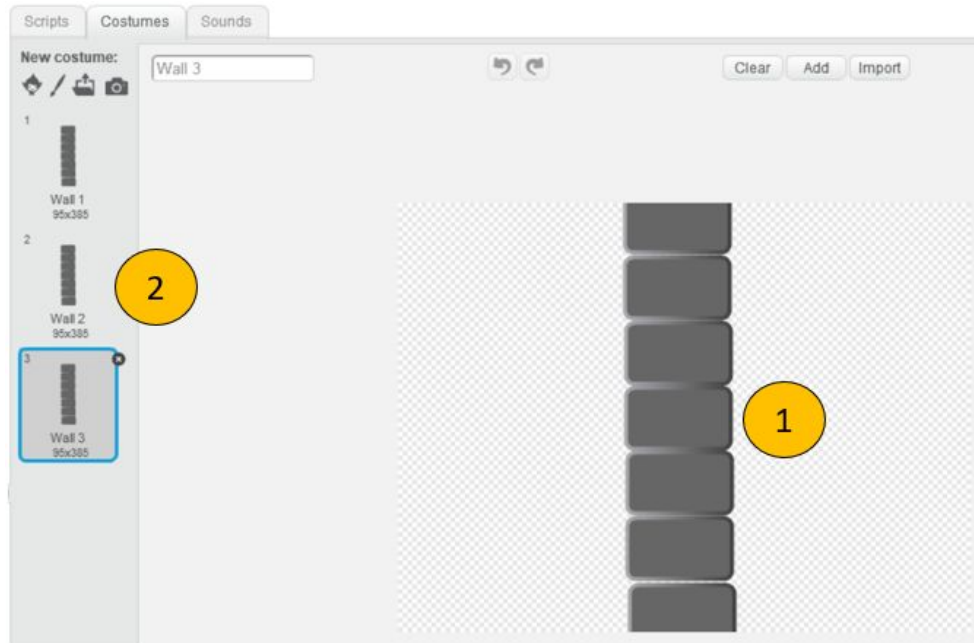
- e. SAVE and RUN (click the green flag then press the spacebar to start)
- 2. Make the bat move:
 - a. Add the following code as a separate code block in the code script space:



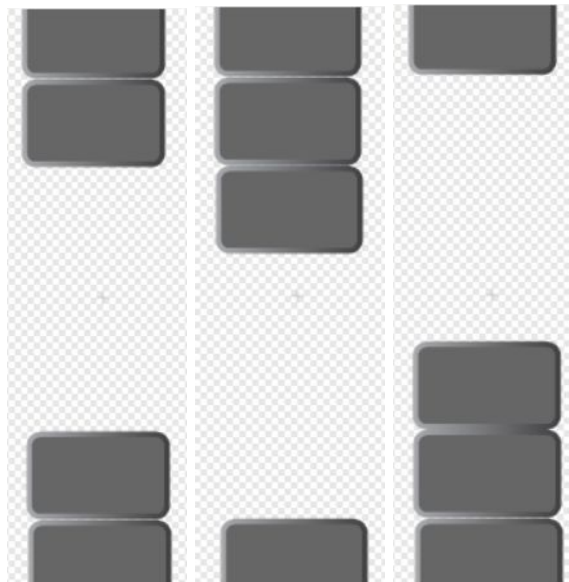
- b. Description:
 - i. When the start message is received, start moving.
 - ii. Our bat will fly up when the space bar is pressed, but we don't want it to move up the very first time, so make it drop 16 spaces when we start.
 - iii. We want the bat to keep moving as long as the game is running, so add a forever loop.
 - iv. Inside the loop, we need an if-else statement saying that if the spacebar is pressed, move the bat up. Otherwise have the bat move down.
 - 1. It looks funny when the bat moves up 32 spaces (4 x 8) all at once, so we split it up into moving 4 spaces 8 times with a pause in between movements. This creates a smoother movement animation.
- c. SAVE and RUN
- 3. Add some obstacles:
 - a. Create a wall:
 - i. Click **Paint new sprite**.
 - ii. Click **Add** at the top of the paint area.
 - iii. Find and select Button3-a (search under the Things section).
 - iv. Click **Duplicate** (the rubber stamp) and then click the Button3-a to copy the block. Drag the copied block on top of the other and repeat these

steps so you have 7 blocks stacked on each other to make a solid wall (see below - 1). If duplicate is being troublesome, just use **Add** again.

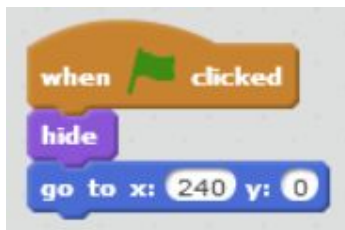
- v. Now duplicate the wall costume twice (on the left side of the paint area) so that you have 3 total wall costumes (see below - 2).



- vi. Now select the first costume and delete the middle three blocks.
- vii. Select the second costume and delete the second block from the bottom and the two above it.
- viii. Select the third costume and delete the second block from the top and the two below it.
- ix. Your three wall costumes should look something like this:



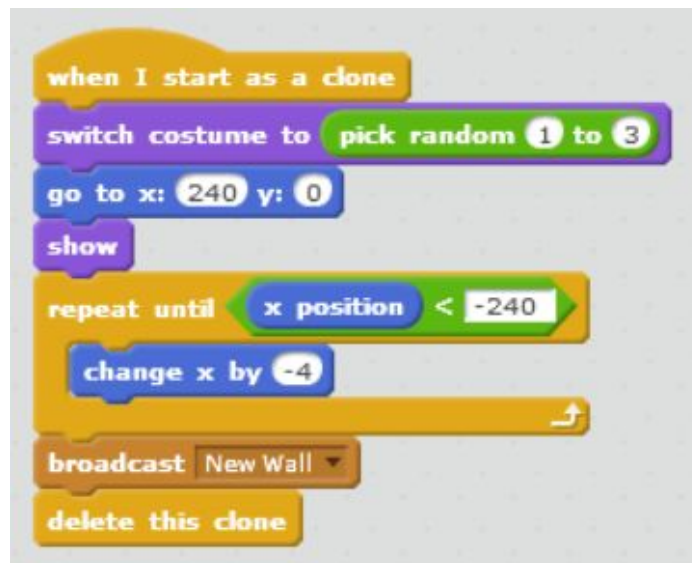
- b. Now add code to make the bat look like it's traveling (WE'LL ACTUALLY MAKE THE WALL MOVE THOUGH):
- i. In your WALL sprite script tab, add code to set up the wall:



1. Description: This centers the wall on the right edge of the screen and hides it so you don't see it.
- ii. Now add the following code block that will create a clone (a copy) of the wall when the game is started:

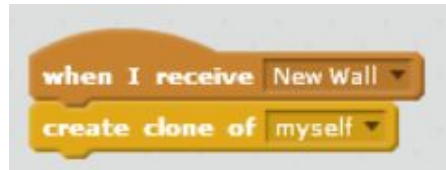


- iii. Now let's make that clone move with the following code: (you'll have to create a "New Wall" message to broadcast)



1. Description:
- When a wall clone is made, start with a random costume (the wall has 3, so we want it to pick a random one between 1 and 3)
 - Start the wall clone centered on the right edge of the screen and become visible.
 - Now move left across the screen until it moves off the left edge of the screen.

- d. When the wall moves off the left edge of the screen, send the new wall message and delete the clone.
- 2. The wall is actually moving, but it gives the bat the impression of travelling right, even though it's not. This is how games like Super Mario work.
- iv. Now add more walls with the following code snippet:



- 1. Description: When the new wall message is sent (the old wall clone is gone), create a new wall clone.
- c. SAVE and RUN
- 4. Let's add the final touches:
 - a. Our bat can travel through the walls, but we want the game to be over if there's a collision. Add the following code to the bat sprite's code block under the if-else statement: (you'll have to create a "Game Over" message to broadcast)



- i. Description: if the bat is touching the Wall or it touches the bottom of the screen (y-coordinate < -170), then send the game over message and stop all animations (the stop animation must come last if you include the Game Over screen).
- b. Add the Game Over screen:
 - i. Click **Choose sprite from library**.
 - ii. Find and select G-block (look under Letters).
 - iii. Go into the G-block's costume tab and click the **Add** button at the top of the paint area.
 - iv. Select the A, M, E, O, V, and R-blocks (hold down the shift key to select multiple sprites at once), then click **OK** to add them to the G-block.
 - v. Arrange the letters in the paint area to spell "GAME OVER" (you'll have to duplicate the E-block or add another one). It should look something like this:



- vi. In the stage area, drag and drop your Game Over sprite to the center it.
- vii. Now add the following code blocks to hide the message when the game starts and show the message when it ends:



- c. SAVE and PLAY!!! We're done!
- d. Extra ideas:
 - i. Include a score: add points to a counter when the bat makes it past a wall (think comparing x-coordinates of bat and wall) or add a timer (sensing scripts). Show final score on game over screen.
 - ii. Include a start screen that shows up when the green start flag is pressed, but disappears when the spacebar is pressed. The start screen can include instructions so other gamers know how to play.
 - iii. You can make the game harder by adding more wall costumes (smaller spaces or spaces closer to the top/bottom), by making the walls move faster, or by making the walls clone at a faster rate (higher x-coordinate).