

Flappy Bird

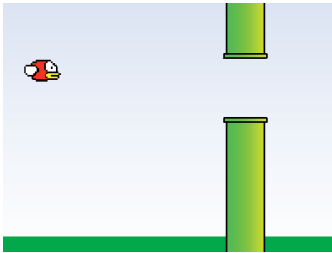
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- Recreate the classic smartphone game Flappy Bird
- Draw your own graphics
- Ideas for adding extra features



45 mins

1. Objective



Flappy Bird is a classic smartphone game written by Dong Nguyen in 2013 and at one point was earning \$50,000 per day!

The idea is simple - pressing the space bar makes the bird fly higher, but gravity pulls him back down to Earth. You must guide the bird through a series of continually-scrolling pipes using just the space bar.

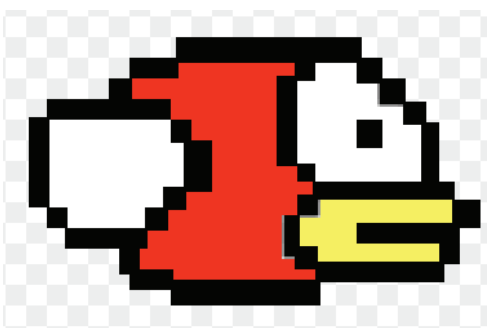
Simple to create, difficult to master! How far will you get?

2. Draw the background



1. In addition to avoiding hitting the pipes, your bird must also avoid hitting the ground.
2. Click the *Stage* icon, followed by the *Backdrops* tab. We've created a simple gradient by clicking the *Fill* tool; using a *top-to-bottom gradient* fill.
3. The grass needs to be a solid colour so that Scratch can use the *if touching color* block to detect the collision, so draw a solid green rectangle across the bottom.

3. Draw the bird



1. Delete the cat sprite -- you'll be creating your own graphics for this project.
2. Using the right-mouse button, click on the sprite and select *delete*.
3. Click the *Paint new sprite* icon to open Scratch's drawing tools.
4. Draw your own bird
5. In keeping with the retro graphics, we've made a blocky pixelated bird graphic. Can you draw a better one?

4. It's game over, man!



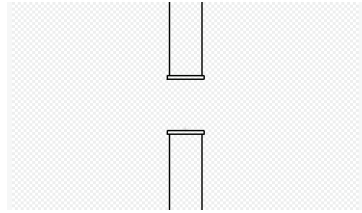
1. Create a new sprite which will be shown when your poor bird crashes into a pipe or the ground
2. Click *Paint new sprite* and create a "Game Over" message
3. We're sure you can create one better than ours!

4. Draw the pipes

1. Now you need to draw the pipes for Flappy to fly between.
2. Create another new sprite using the *Paint new sprite* tool.
3. Draw two pipes as shown opposite. Ensure that they go all of the way to the top and bottom of the window.
4. Don't fill them in just yet!

5. More pipes

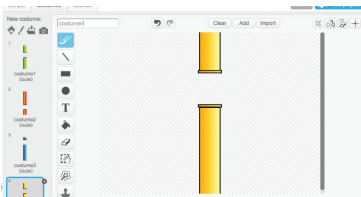
1. Right-click on the costume icon and select *Duplicate*.
2. Repeat this process until there are at least four pipe costumes.



6. Move the gaps

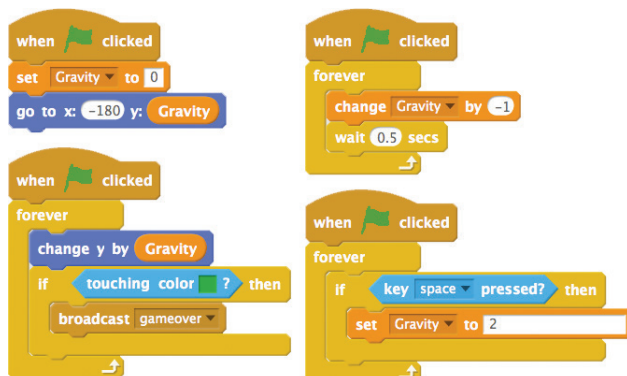
1. On each of the costumes, move the pipes up or down to put the gap in a different position.
2. Draw a box over the pipes using the *Select* tool, then use the up and down arrow keys on your keyboard to move the graphics.
3. If this creates gaps at the top or bottom of the pipes, draw the lines in using the *Line* tool.

7. Colour-in the pipes



1. With all of the pipes created, you can go back to each of the costumes and colour them in.
2. Ensure that Flappy easily fits through the gap. If not, use the *Shrink* tool to reduce Flappy's size

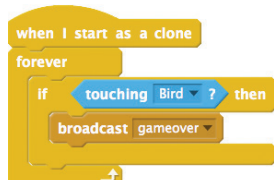
8. Add the scripts



1. Click on **Flappy** and add these scripts. You will need to create a variable called *Gravity*.
 - The first script positions Flappy at the start location;
 - The one next to it continually reduces the value of Gravity.
 - Next, we continually change Flappy's Y position (the height) by the value of gravity. Remember to change the touching color value to the same colour as the grass. A *broadcast* message will tell the rest of the game if Flappy crashes!
 - Finally, pressing the *space* key sets Gravity to 2, causing Flappy to rise into the air



2. Click on the **Pipes** sprite and add these scripts.
 - The first script hides the pipe, continually creates clones of itself at random intervals.
 - The script next to it chooses a random pipe costume. Remember to modify your random number range if you have a different number of pipe costumes. It then positions the pipe at the far right of the stage and moves it across to the left. When it reaches the far left, the clone is destroyed.



- The final script detects when Flappy hits the pipe, and broadcasts the *gameover* message to other scripts.



3. Click on the **Game Over** sprite and add these scripts.
 - The first script hides the game over sprite
 - The second script displays it when the gameover message is broadcast, and stops all other scripts from running.

- Congratulations on making your Flappy Birds game. How can you make Flappy's wings flap?