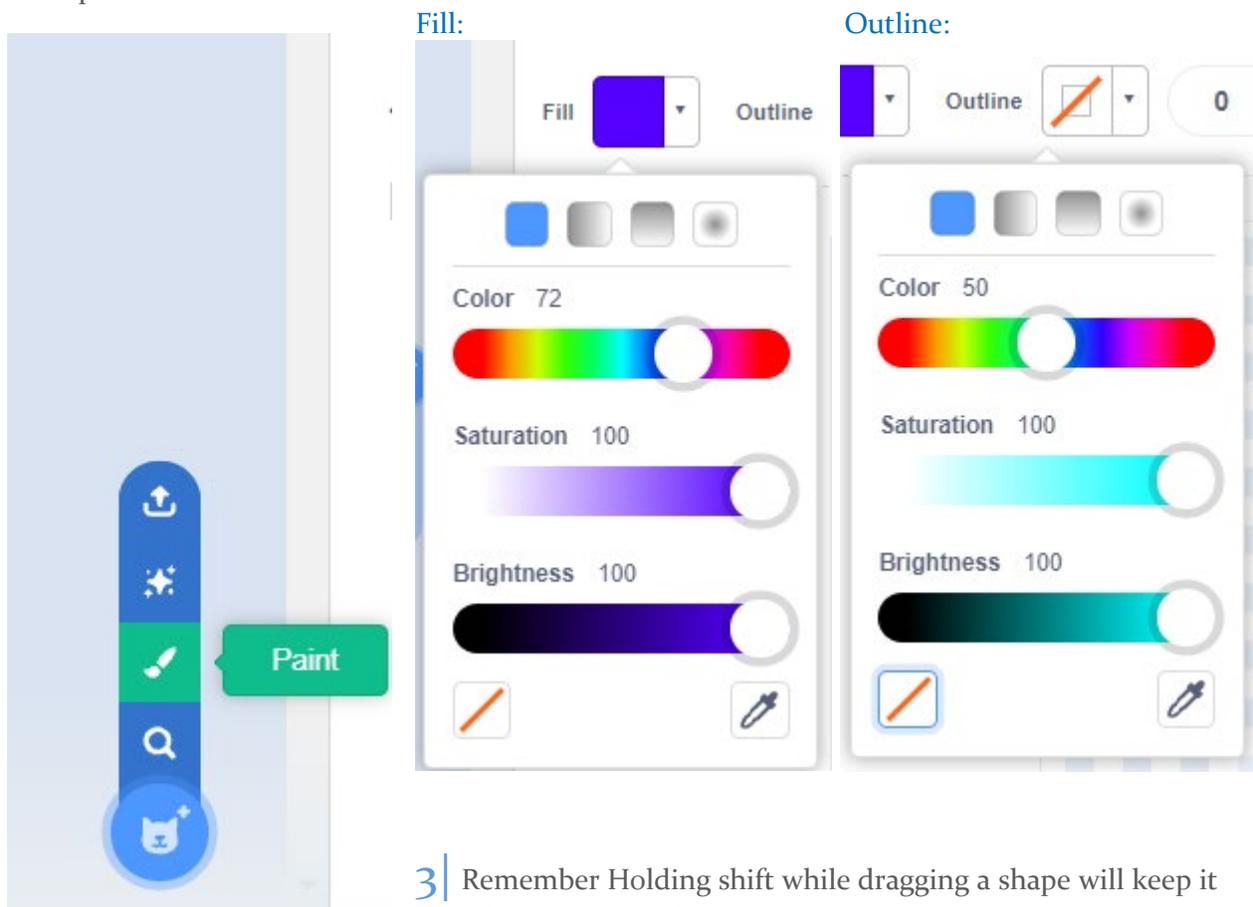# Lesson Plan #3

STARTER PROJECT

Connor Kalvar | 9/29/2021
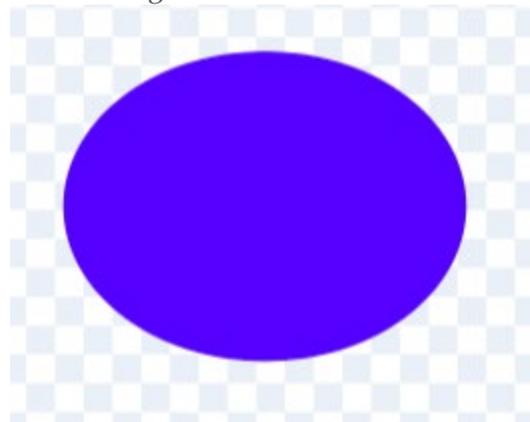
Third Project – Colorful snake

In this project we will make a colorful snake that we can move around and make jump, and have it fall to the ground.

1| We will start off again by creating a new project, which we do by clicking the create button on the home page at Scratch.mit.edu. Hopefully you have set up an account at this point, if you haven't, refer to the first lesson plan to find out how to set up a Scratch account.
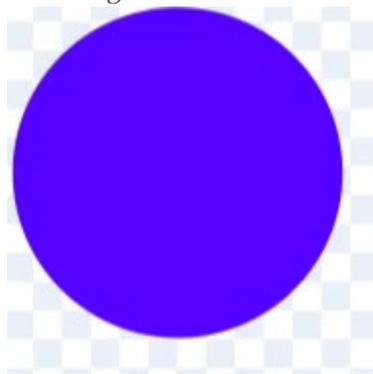
2| Now to start off we will go into sprite 1 and create a new costume, it will be a sphere of any color, but make sure to set the saturation to 100. And also make sure the outline is set to transparent.

Fill: Outline:

Fill   Outline   Outline   0

Color 72   Color 50

Saturation 100   Saturation 100

Brightness 100   Brightness 100

Paint

3| Remember Holding shift while dragging a shape will keep it from becoming misshapen.

Not holding shift   Holding shift:

4 | Now that we have created this costume, we can create some functionality for it. Go back into the code tab on the top left. We'll start off simply enough, with a go to block that places us in the center, then a forever loop that will constantly create clones (Found in control tab) and change our color by 10 (Found in the looks section). When completed properly your sphere should go to the center of the screen and constantly be changing colors.
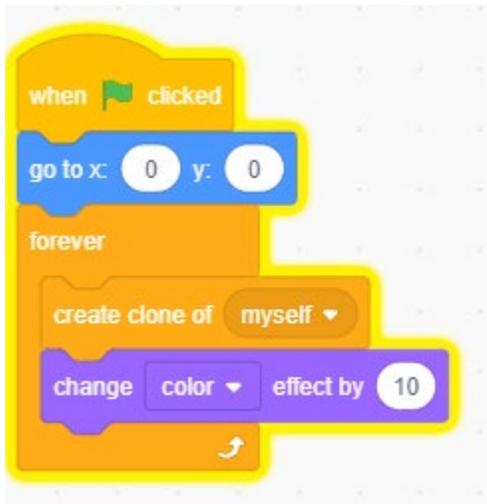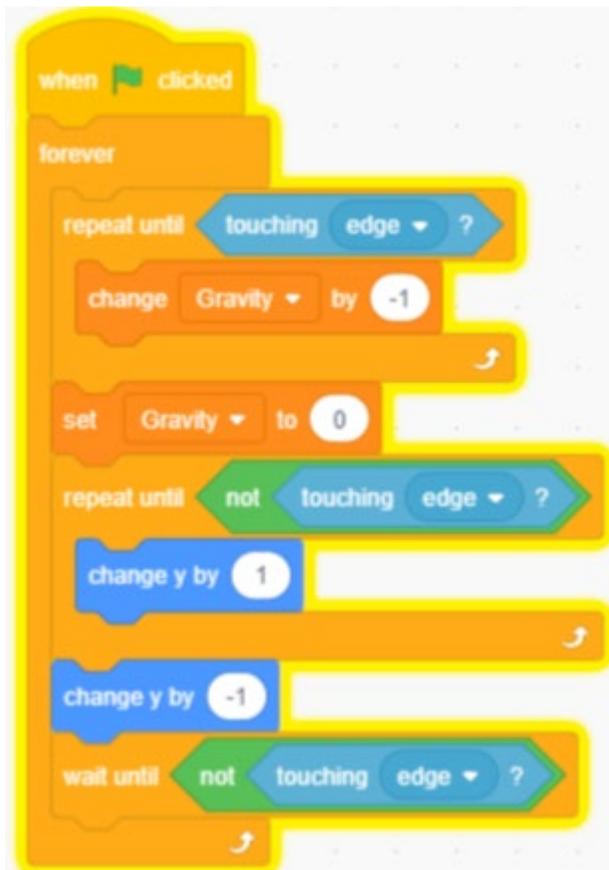

5 | Next, we'll add this script:
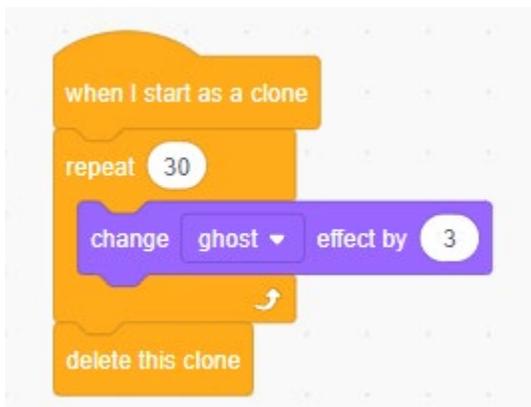
When I start as clone is under control, with the repeat loop and delete this clone block being found their as well. The change effect but block is in the looks tab, we want to change the ghost effect by a small value a bunch of times so that we get a slow fade effect.

6| Prepare yourself, this next script is a big one.

Quite a lot, so let's break it down, we have all of this in a forever loop, meaning that we are going to do this constantly. In the next part, we create a new variable, called gravity which as the name implies will be used to simulate gravity. We can create a new variable by going to the variable section and clicking the create a new variable button.

So, the repeat until touching edge loop is changing our gravity variable by -1, which means when we aren't touching the edge in practice this means we will accelerate downwards until we touch the edge. Once we touch the edge, that repeat until loop stops running and we move on to the next part of the script. The next part is to set gravity to zero because we have hit the ground, and we don't want to go further past it. The touching block is found in sensing and repeat until is found in control.

This next part of the script is a quick fix to a problem we would otherwise have, our sprite having moved too far into the ground. So, we use another repeat until loop, this time we are checking to see if we aren't touching the edge (Touching is found in sensing and the not block is found in operators). We change our Y by +1 until we are just above the edge and then move -1 Y to sit right on the edge.

The last part, we use a wait until block (Found in the control section) to wiat until we leave the edge so we can run our gravity script again, other wise we would just vibrate in the edge.

7| But of course, this script right now doesn't do anything, because we need to change our y by the gravity variable for it to work. We can fix this with a simple script.

This simple script will simply change our Y by the number that gravity. Now with these four scripts, when you press the green flag, our spirte should fall to the edge of the screen and then stop, leaving a trail behind itself. Like this:
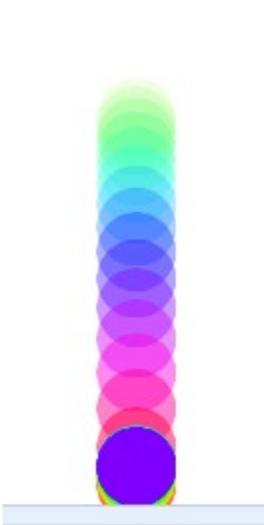
8| Great, but how are we to move our Sprite? Well, lets start off simple:

So when we press space, we set the gravity variable to 10 which thanks to your script earlier means that we will shoot upwards, but the gravity script also kicks in, and begins to slow our upwarsd momentemnt, and eveuntualy it will pull us back down. So when you press space, your charater should jump up, then fall back to the ground.

9| Now, we need to move our chararter left and right. To start this process we will create a new vairiable called Left Right. We will put in two simple scripts:

So when we press the left arrow, we set left right to -5, and when we press the right arrow, we set it to 5. But this is not causing the sprite to move left or right.

10 Remember the script from step 7, we need to make a additon to it. Grab a change X by block, put a left right variable in it and put the change X by into the loop like this:

Now when you click the green flag and press left or right your charater should move left or right, but once we get moving we don't stop! We need to bring the Left Right variable back to zero.

10 We can acomplish that with this script:
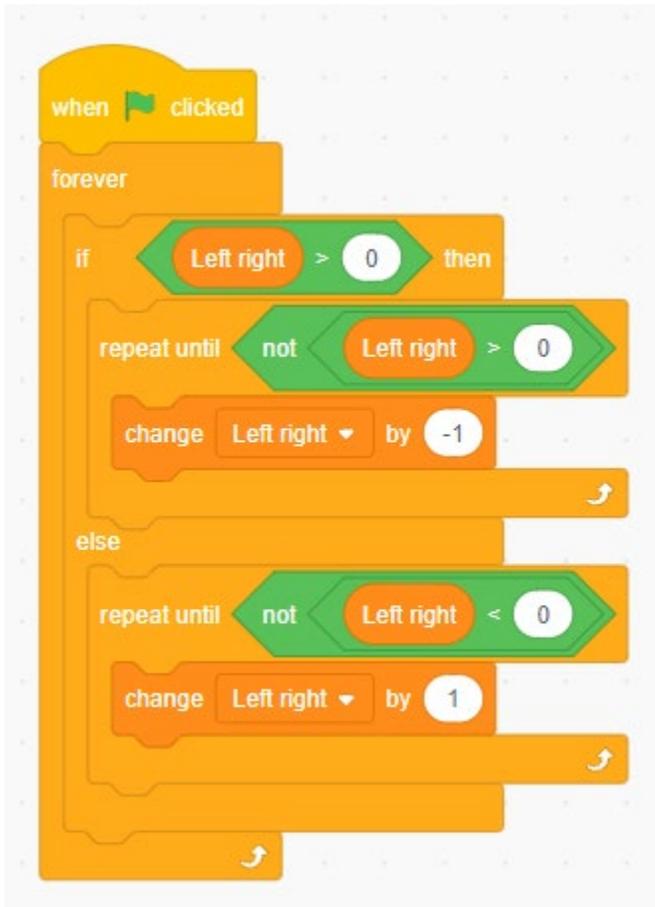
There's a lot here, so lets start from the top and go down. We have a forever loop attached to a green flag, meaning when we click the green flga we will run this script constantly. Next we have a if else loop, now what does that do? Bascially when a if else stament is true (in this case when left right is greater than Zero), it runs the top part:

If that statement isn't true, then it runs the bottom part:

This is the else part of the script.

Now what do those two scripts do? Well the top one activates when Left Right is greater then zero (When the sprite is moving right). And this scripts goal is to get Left Right back to zero, so we use a reapet until loop that changes Left Right by -1, which will bring Left Right back to zero. The condition we are checking for is when left right is no longer greater then zero. Both the not block and greater then block are found in operators.

The bottom one does something sismilar, except instead of dealing with when Left Right is greater then zero, it deals with when it is less that zero. It is the same as the top script execpt we use a less that operator and we change Left Right by +1 instead of -1.

11 Great, everything should work well now, we should be able to move your sprite around the screen. But there is a problem, when we touch the sides of the project and press jump we fly up to the top of the screen and stay stuck there. Why is this? Well remember earlyer when we made our gravity script we check to see if we touching the edge, so when we hug the left or right part of the screen, we are touching the edge. Meaning that we are always touching the edge which breaks the script.

12 How are we to fix this? We can change what thing gravity script is checking to see if we're touching. So lets create a new *sprite*. Once again go to the bottom right a hover over the blue crile with the picture of cat, and then click on the paint brush.
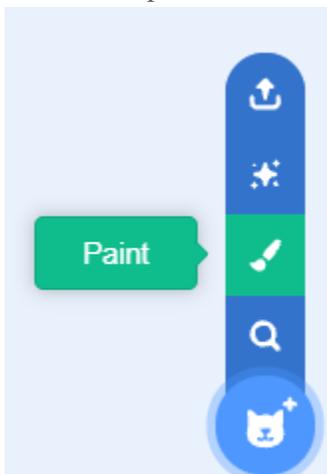
Once we are into the costume editor. We will make a thin white rectange like this:

Convert to Bitmap
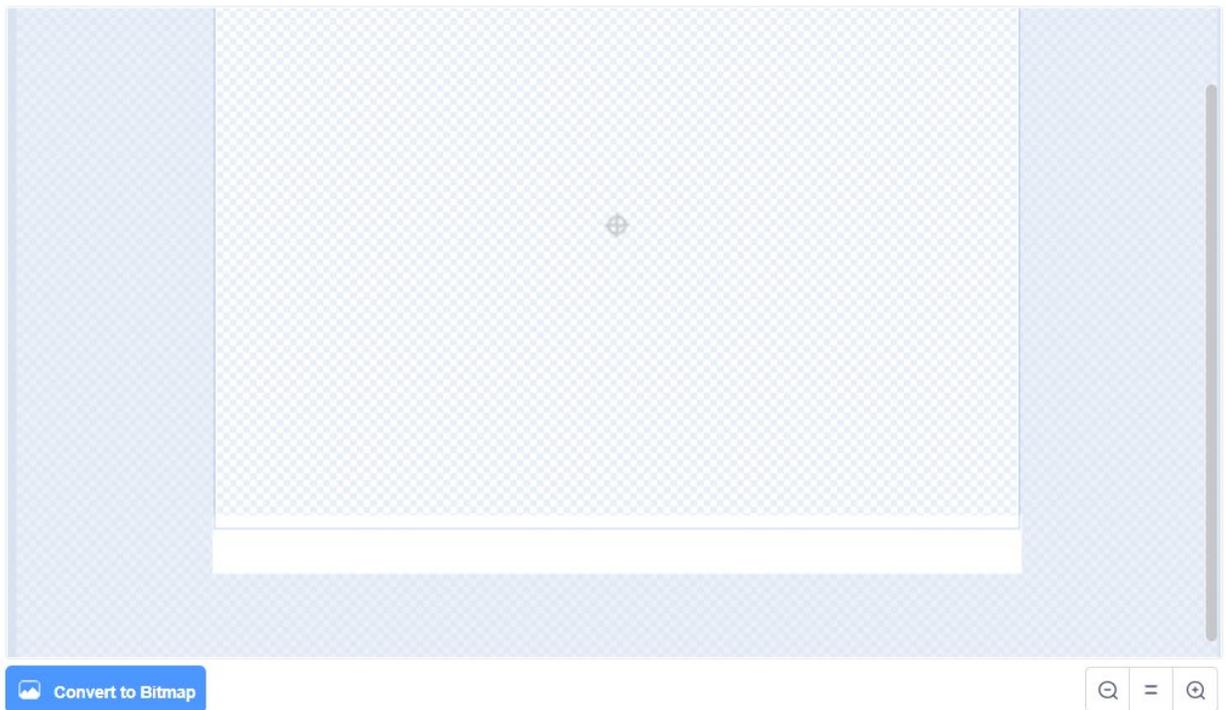
See it there at the bottom? Make sure to set the outline to clear and the color to white like this:
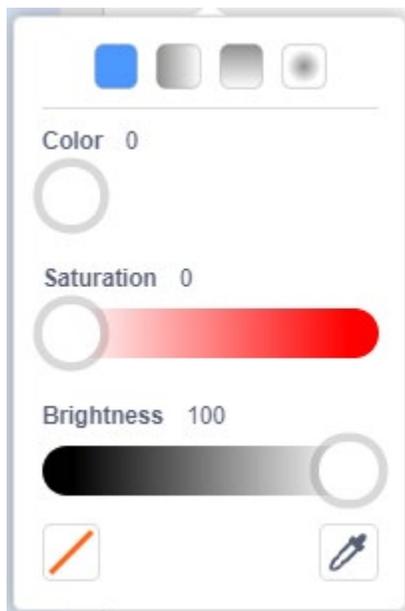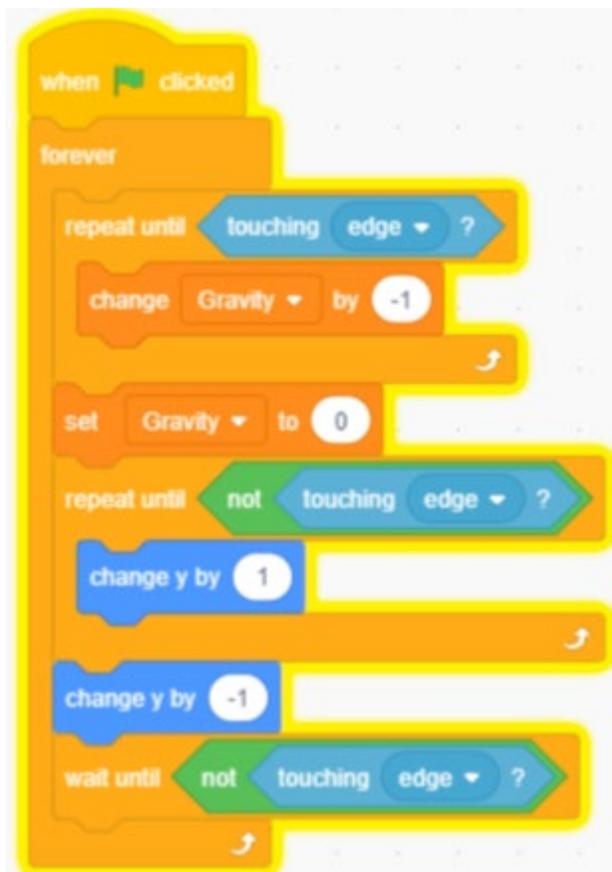
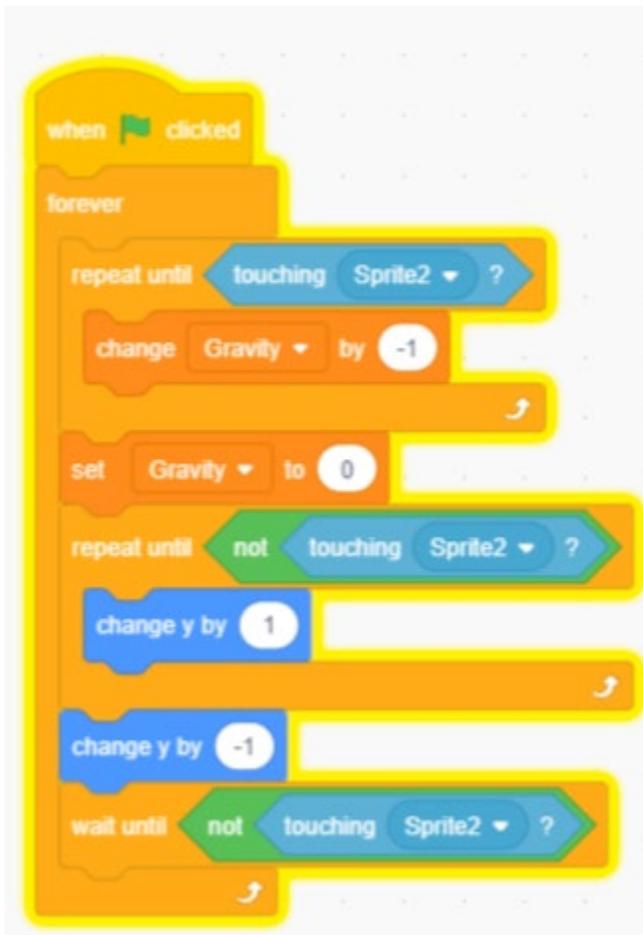**12** Click into the code tab and put this simple script in.

This will center our floor sprite.

13 Now we Can go into sprite 1 and change the gravity script from this:

Next page.

To this:

Great! Now we should no loner get stuck on the ceiling orfly up the edges.
And with that we are done, enjoy!