BEAM Week 1 Lesson Plan - Scratch Demo

Download Project Skeleton

Download [this project skeleton](#) as per steps [linked here](#).
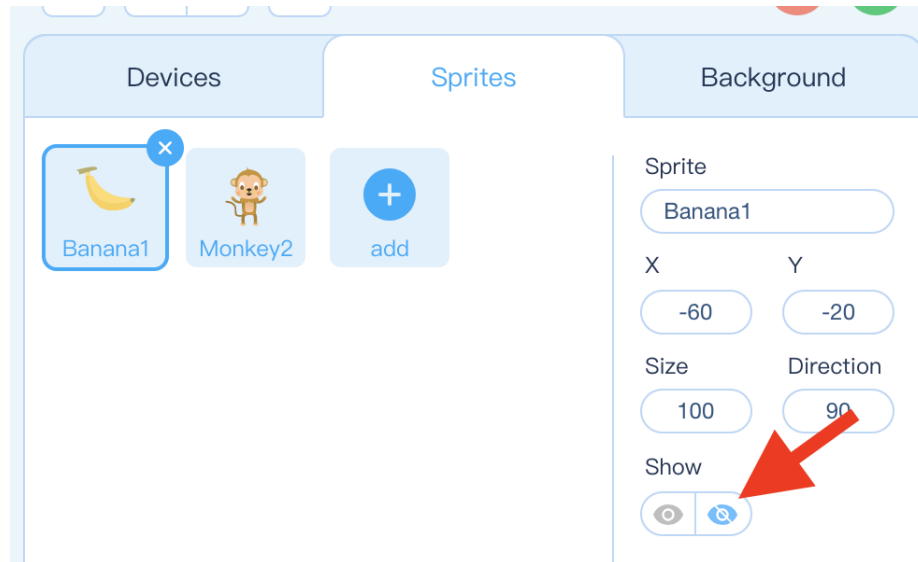
Basic Movement

INTRODUCE MOVEMENT BLOCKS, EVENT BLOCKS
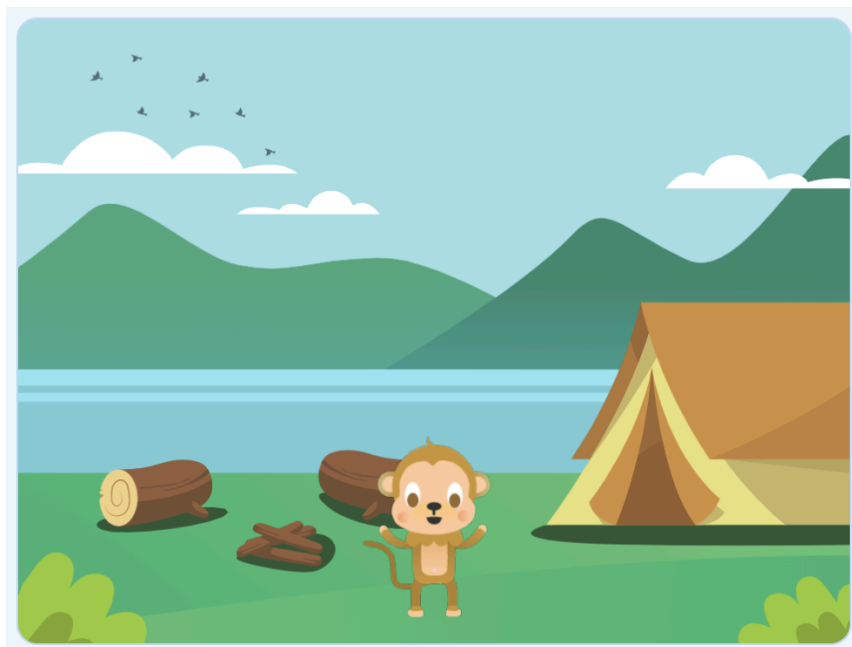
Step 1: Environment Setup

For now, let's focus on getting the Monkey to move!

Select Banana Sprite.

Press the "don't show" button under the sprite. The banana should now no longer be on the screen.

The environment should look like:

Step 2: Event Blocks

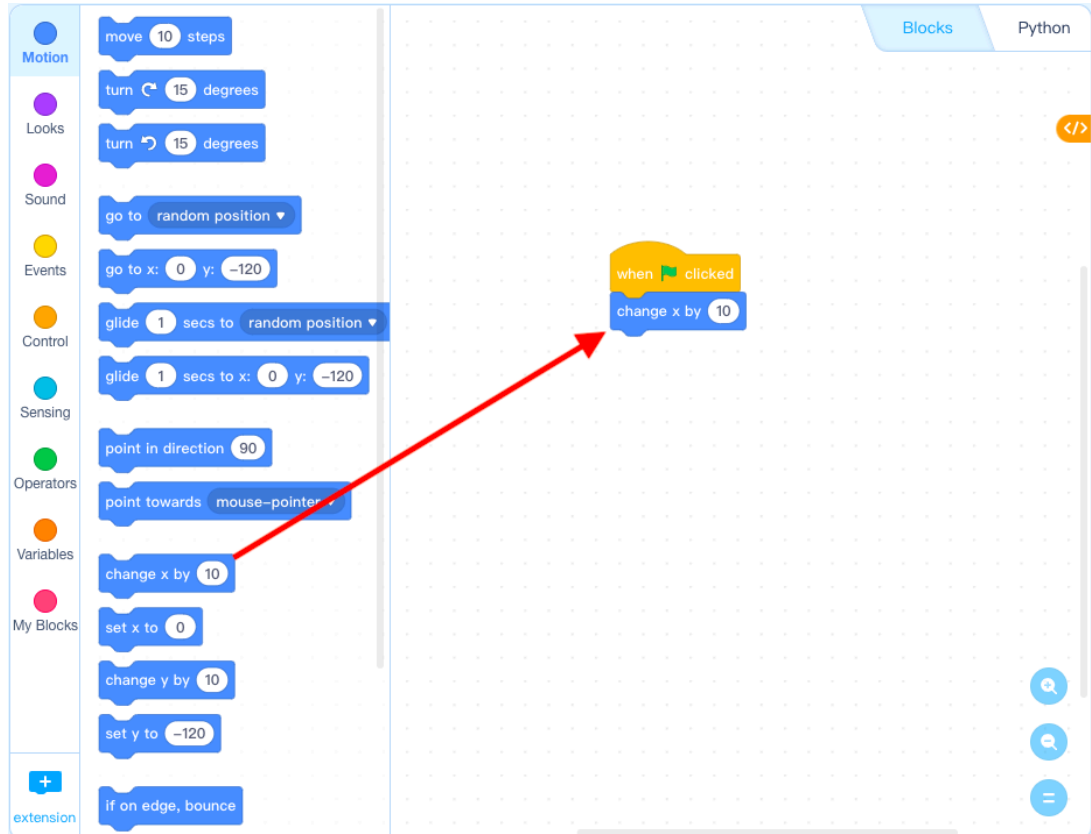Let's make the monkey move! **Select the Monkey sprite in the sprites tab.**

Select the EVENTS tab in the blocks editor and drag a "When Flag Clicked" block into the working area.

This tells the monkey that when flag clicked, it should do something

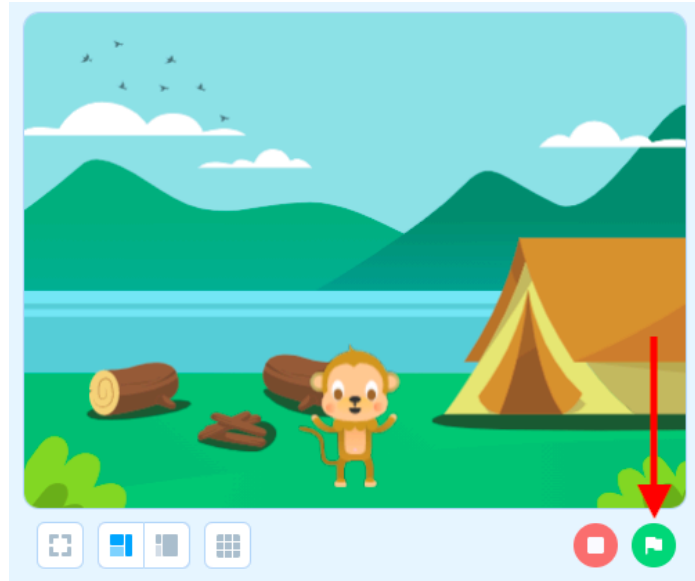## Step 3: Motion Blocks

Now let's add something for the monkey to do:

Go to the MOTION tab of the blocks editor. Drag a "Change x by __" block and attach it to our "When Flag Clicked" block:

We can read this group of blocks as: "Whenever the flag is clicked, change the monkey's x coordinate by 10".

Let's try it out!
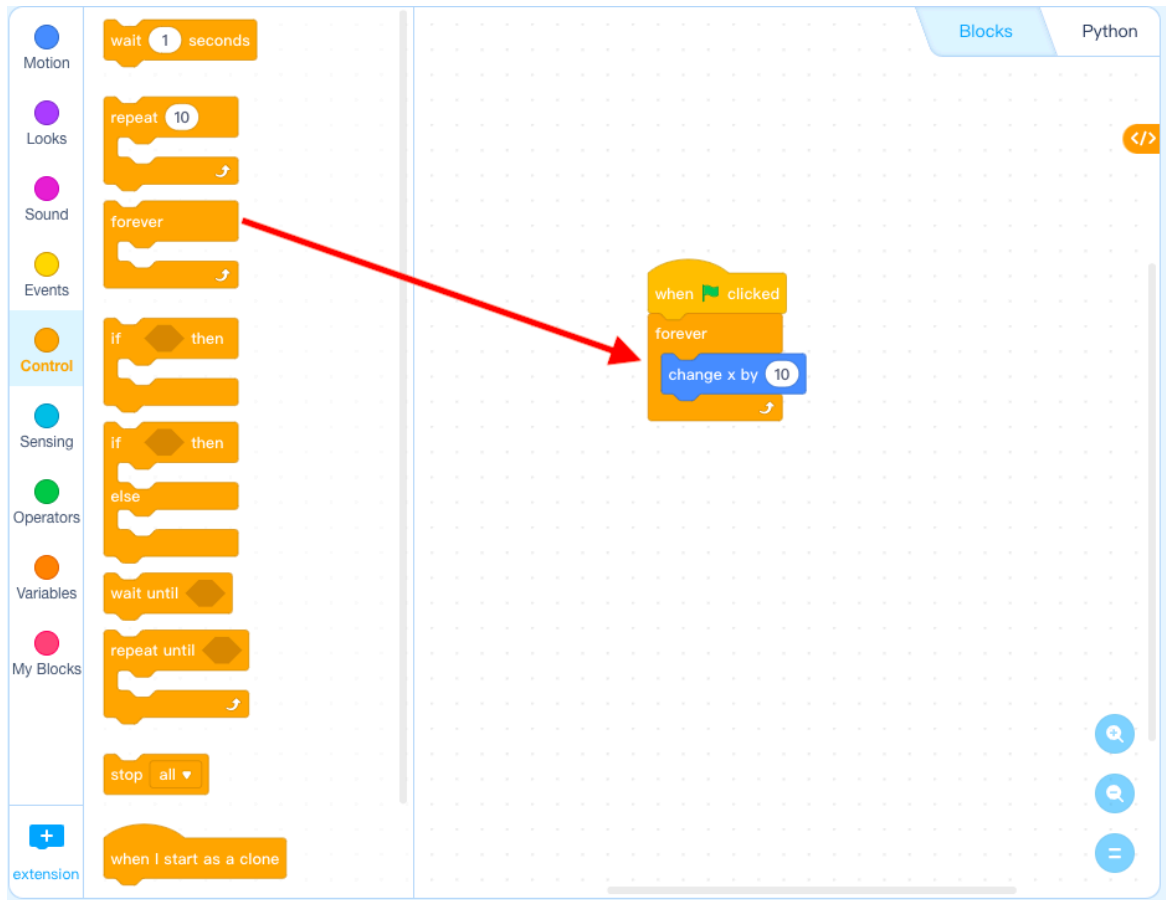Click on the Flag icon under our scene:

The Monkey moves right!

Step 1: Moving In a Line (Loops)

Let's make the monkey walk all the way to the right edge of the screen.

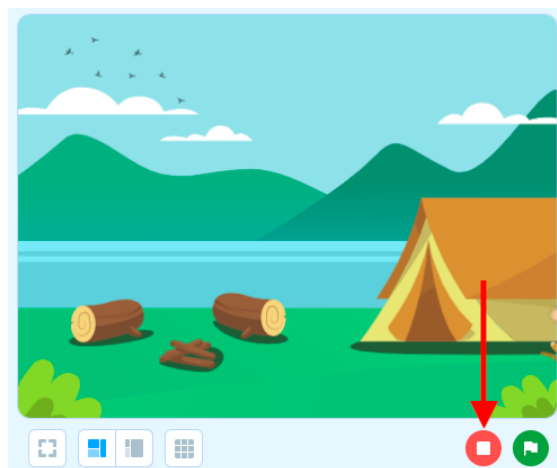Drag a "Forever" block on top of our "Change x by __" block from the CONTROL tab.

The "Change x by __" block should be sandwiched by the "Forever" block like this:

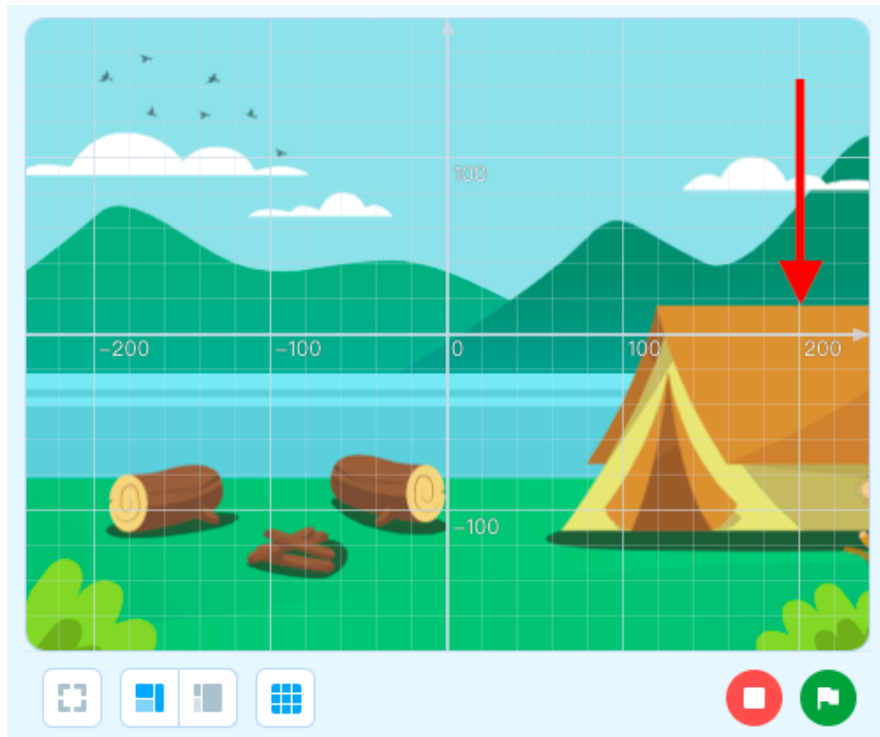We can read this as "When the flag is clicked, **repeat** change x by 10 forever".

Click on the flag and see what happens.

You can click on the red square icon below the scene to end the program.

## Step 2: Stopping at Edge of Screen (Conditionals)

Let's take a look at how the scene is set up. Turn ON the grid by clicking this button under the scene:

200 seems like a good stopping point on the grid! Let's tell the monkey to stop once it's at this point.

Change the monkey's x coordinates back to 0 under the sprites tab to reset its position.

Go back to the CONTROL tab of the blocks editor. Drag an "If __ Then" block on top of our "Change x by __" block. Your group of blocks should look like this:
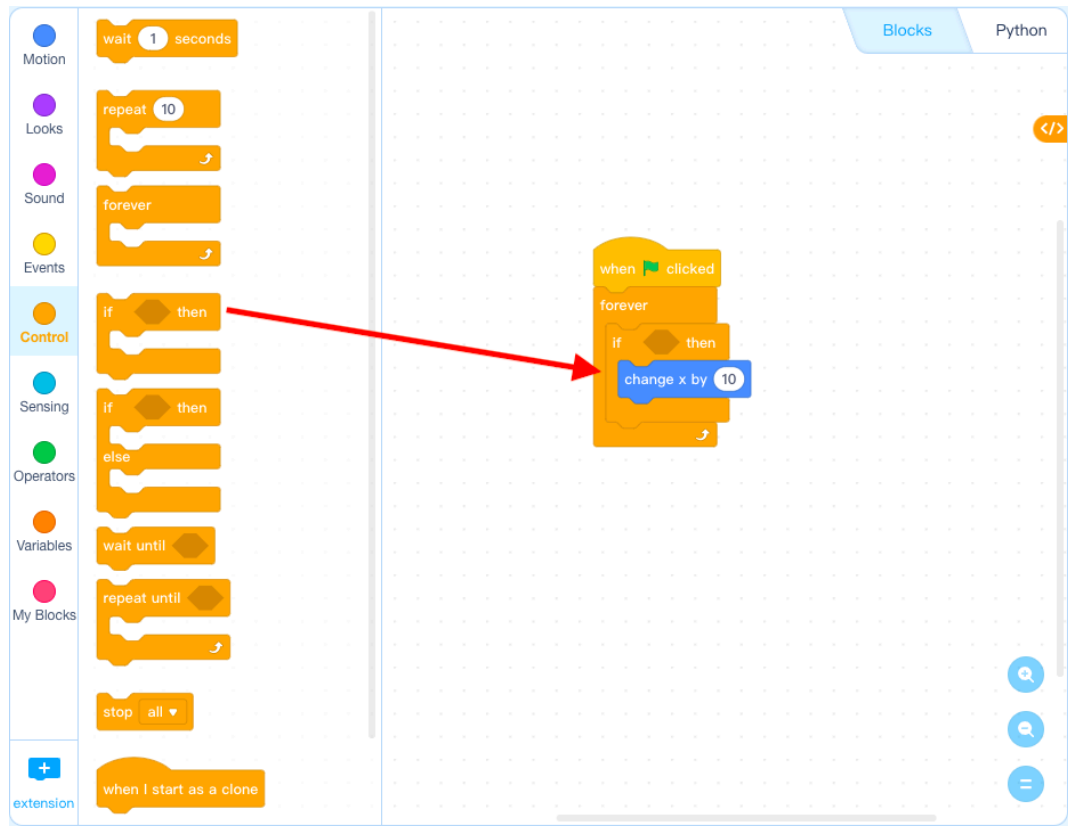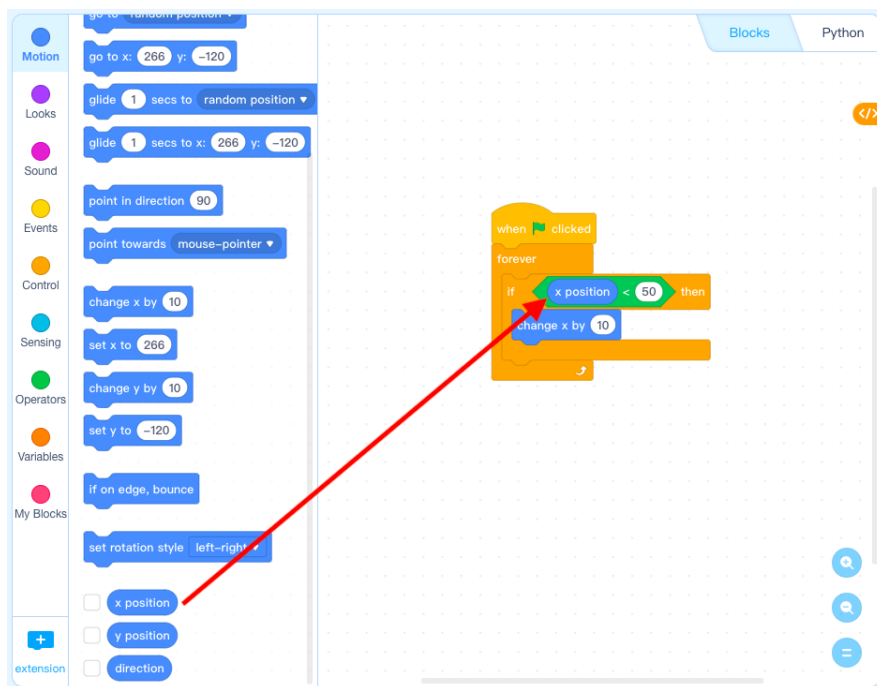
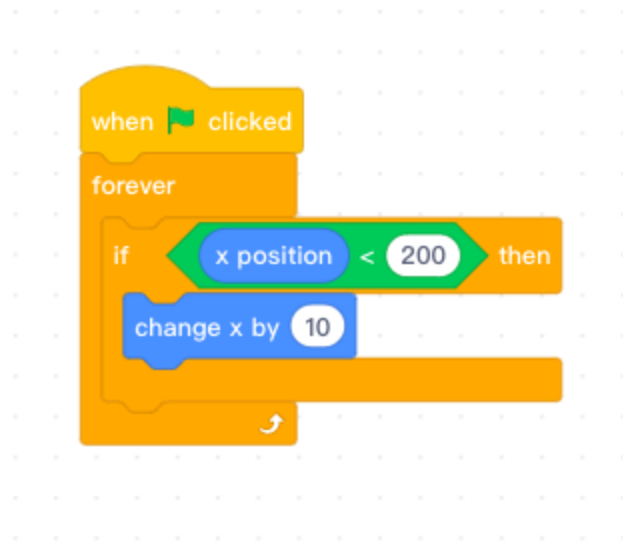When do we want to change x by 10? Before the monkey has reached 200!

Go to the OPERATORS tab of the blocks editor. Drag an " __ < 50 " block into the blank spot in the "If __Then" block.
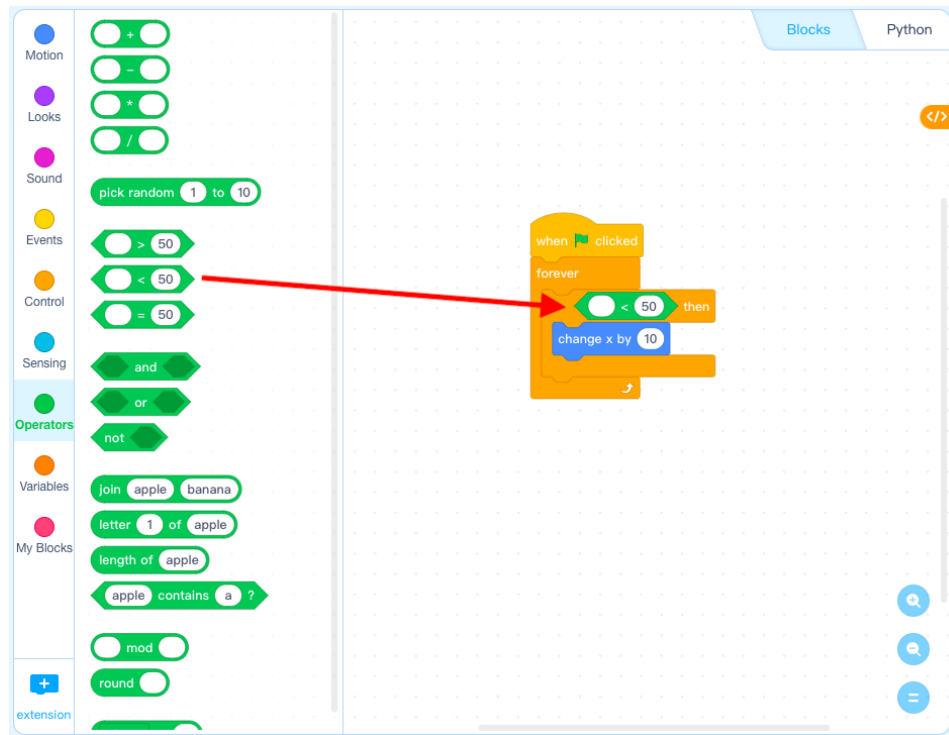
Go to the MOTION tab of the blocks editor. Scroll to the bottom and drag a " x position " block into the empty space in the "___ < 50" block.

We want the monkey to stop when their x-coordinate reaches 200

Now what the block is saying is: "When the flag is clicked, repeatedly check if the monkey's x position is less than 200. If it is, change x by 10."

Press the flag to try it out!

Arrow keys

Step 1: User Input

What if we want to use the keyboard to tell the monkey what to do?

Delete the blocks inside of the "Forever" block by clicking on the **top-most** block and dragging the group into the block selection panel.

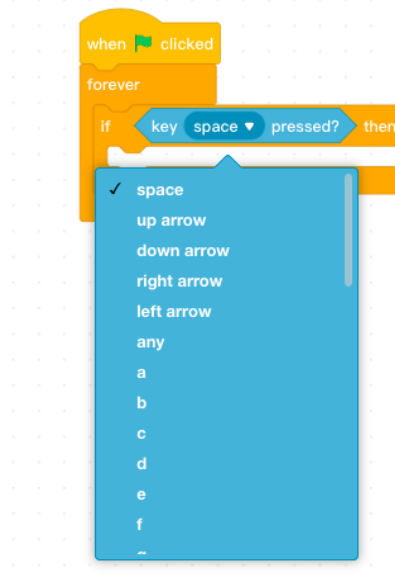**IF** the left arrow is pressed, **THEN** we should change x by -10!

Go back to the CONTROL tab of the blocks editor. Drag an "If __ Then" block into our "Forever" block.
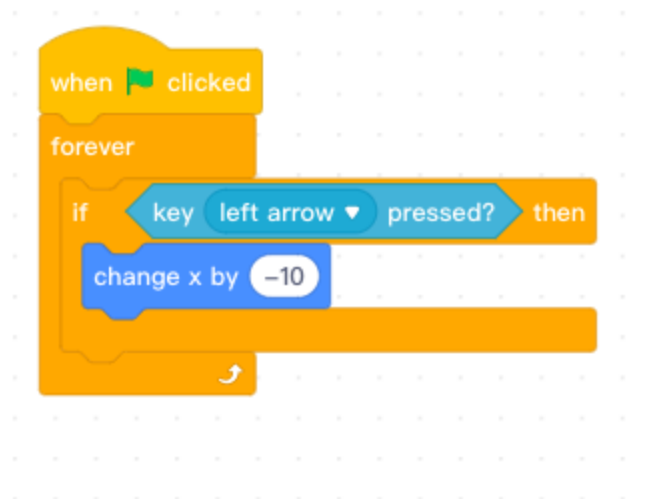
Go to the SENSING tab of the blocks editor. Drag a "Key__Pressed?" block into the slot of our "If__Then" block:
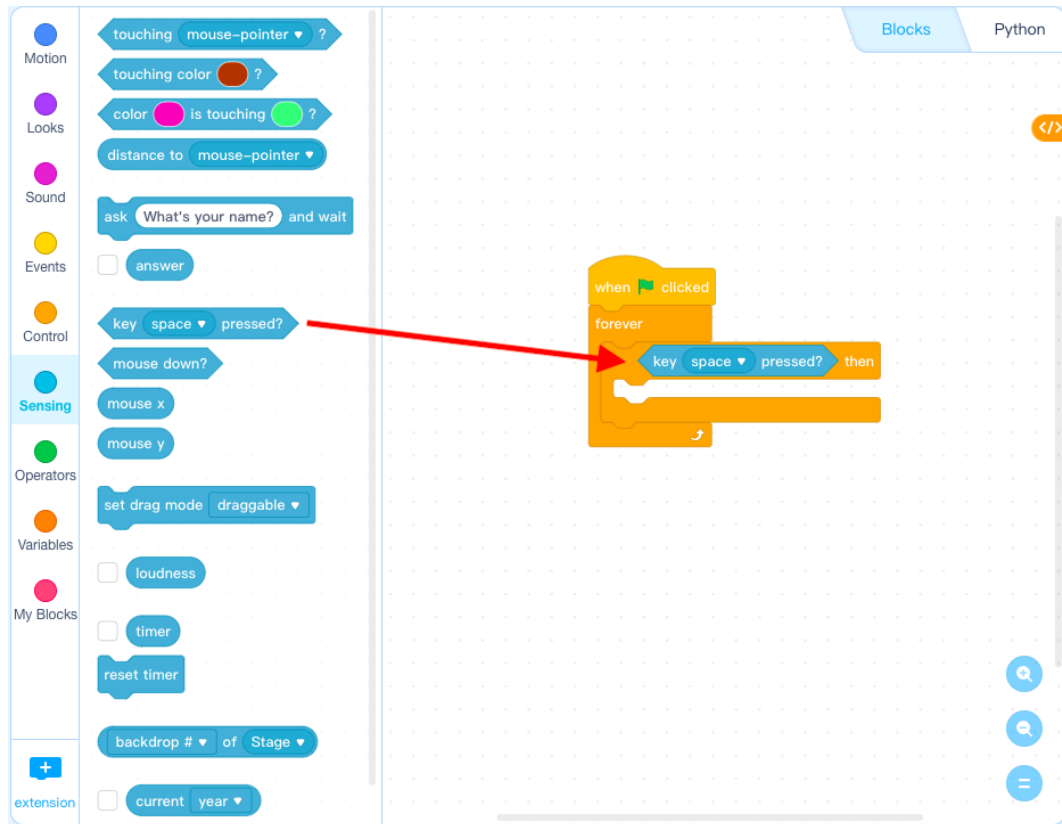
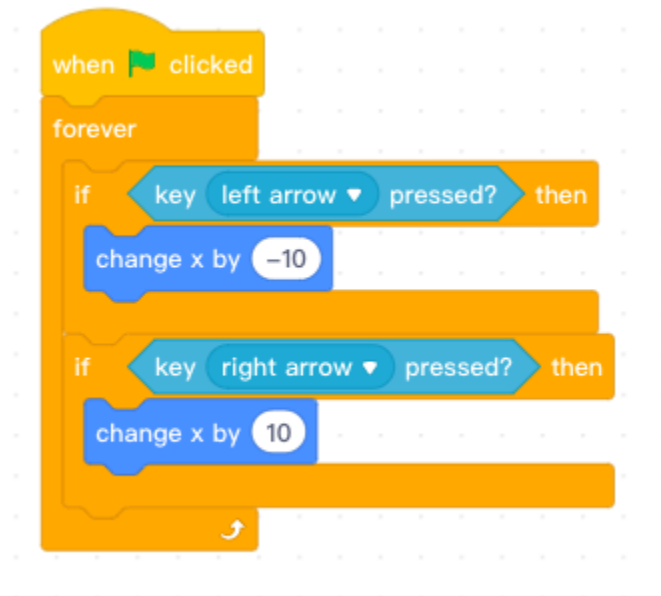Click on the little arrow next to space to choose a key. Select "left arrow".

Go to the MOTION tab of the blocks editor and drag a "Change x by __" block into the bracket of the "If_Then" block. Change the 10 to -10 (since we're moving left):

Click the flag to try it out!

Now let's get the right arrow key to work as well.

This is the same as before and should end up looking like this.
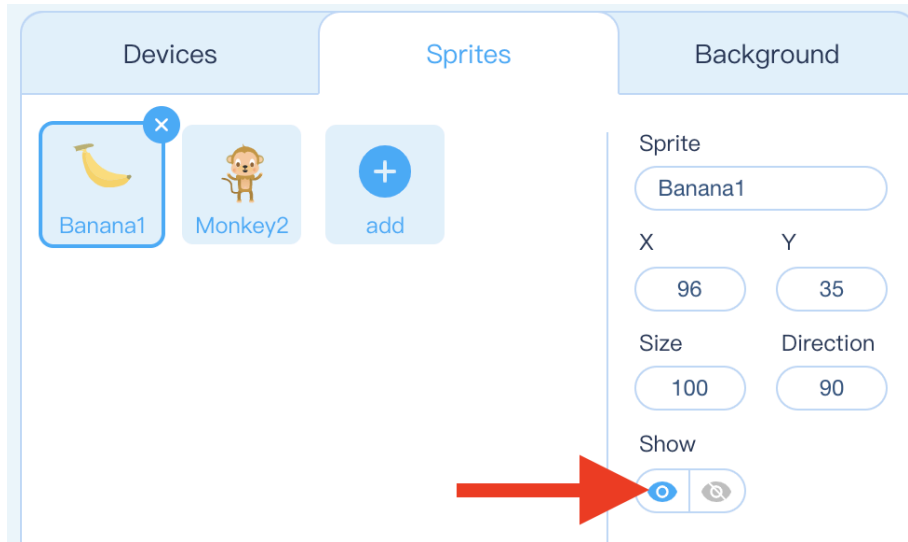

Click the flag and try it out!

Overview of Initial Banana Code

Let's take a look at what code is already given in our banana sprite!

Step 1: Setup Banana

First, let's bring back the banana.
>   Select Banana Sprite.

>   Press the show button.

>   Press on the green flag to see what the banana does so far!

Let's take a closer look at these blocks.

## Step 2: How Banana Falling Works

>   Breaking down this group of blocks:

1. "When flag clicked" is followed by "set y to 150" - so when we first start our game, the banana should jump to the top automatically

2. Next we have a FOREVER loop surrounding a "change y by -10" - so the banana should fall down forever!

Click on the block group to test it out by itself!

Step 3: How the Respawn to Top Works
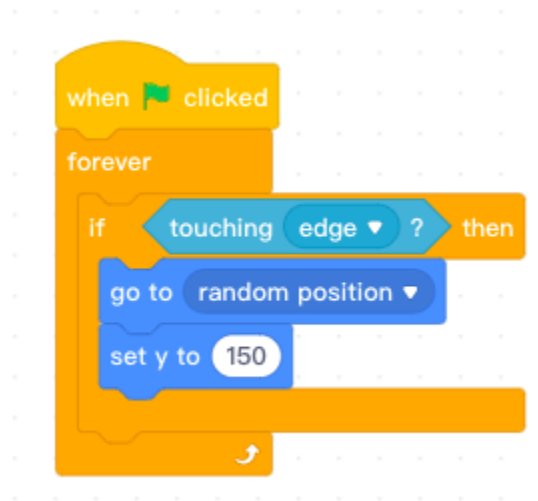
Breaking down this group of blocks:
1. These blocks will be repeated over and over again while the game is being played.

2. Next we have an **IF** bracket: we're telling the banana, check IF you **touch an edge** (so an edge of our game screen)

3. Inside the bracket we have two blocks:

   a. First: "**go to random position**"
   b. "**set y to 150**" block - so the banana is pushed all the way up to the top of the screen.
   c. These two blocks happen pretty much instantaneously! So to us, the banana looks like it just jumps to a random spot on the top of the screen.
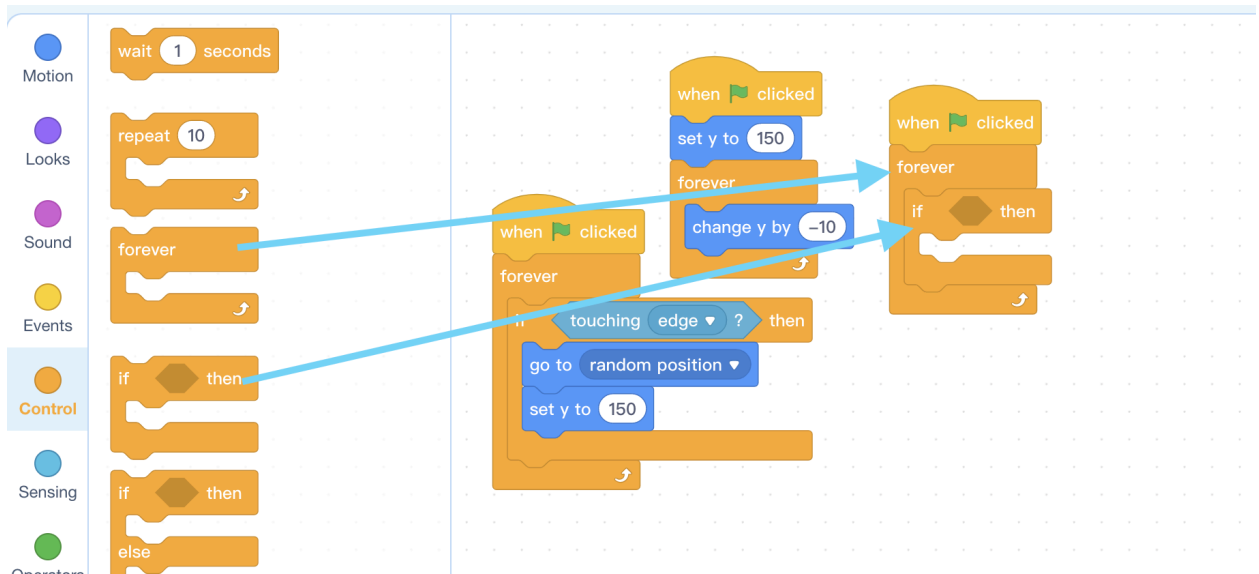
Monkey Banana - Full Game

INTRODUCE VARIABLES

Make sure to be working in the blocks of the sprite Banana.
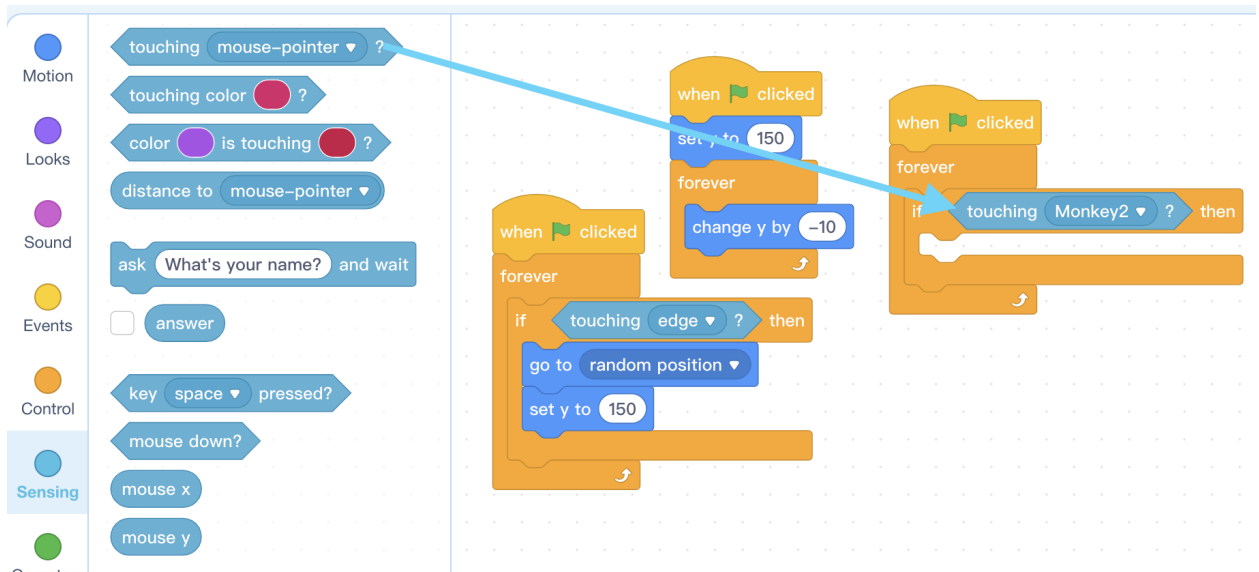
Step 1: Banana Respawn when Sense Monkey

From EVENTS, bring a third "When Flag Clicked" block into the sandbox.

From CONTROL, bring a "Forever" block to under the "When Flag Clicked" block and drag a "If __ then" block into the body of the "Forever" block.
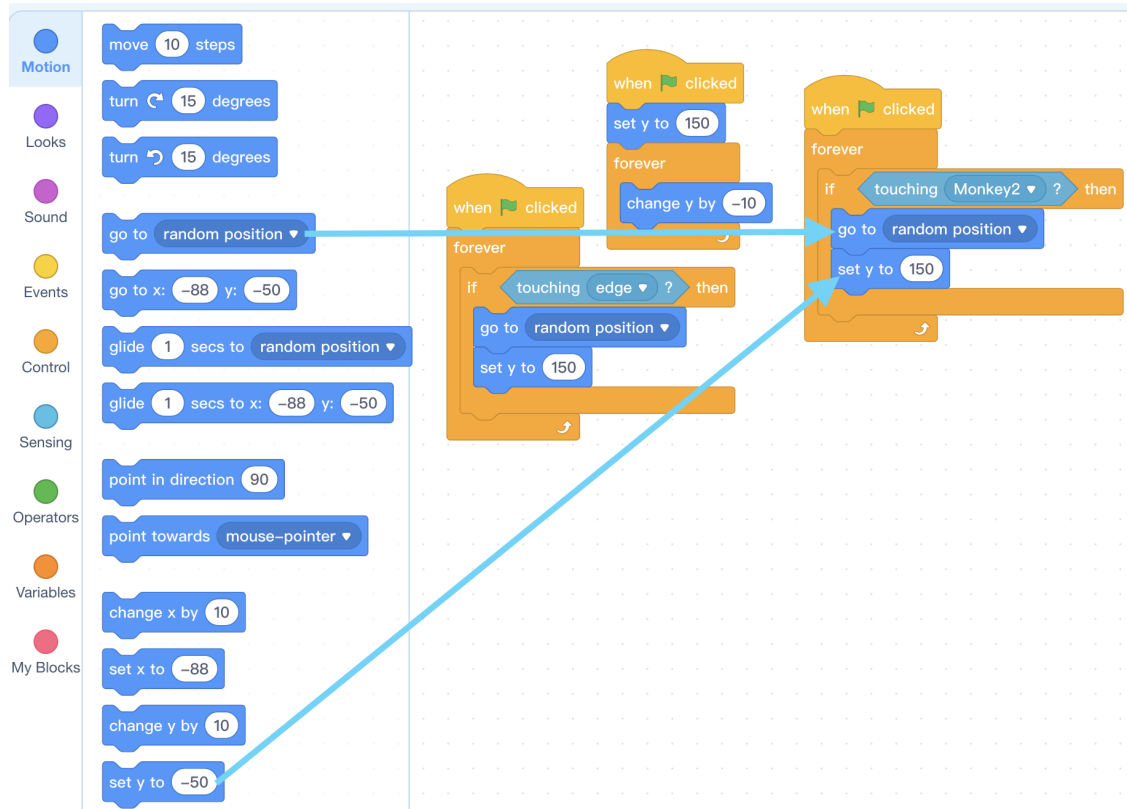

Under SENSING, drag "Touching __" block and place into "If __ then" block.

Change "Touching __" to "Touching Monkey2".

From MOTION, bring a "Set y to 150" block into the body of "If touching Monkey2 then" block.

From MOTION, bring "Go to Random Position" block into body of "If touching Monkey2 then" block and above "Set y to 150" block.
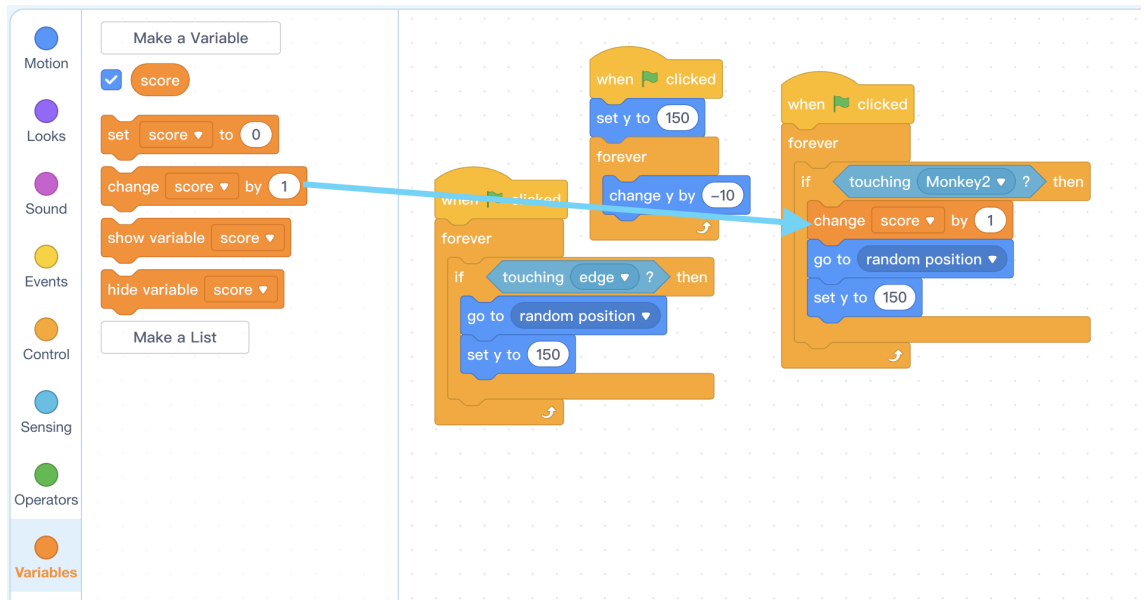

Step 2: Game Score

A variable is something like "Dollars in bank" which represents the number of dollars you have in your bank. We will have a variable "score" that represents the game score.
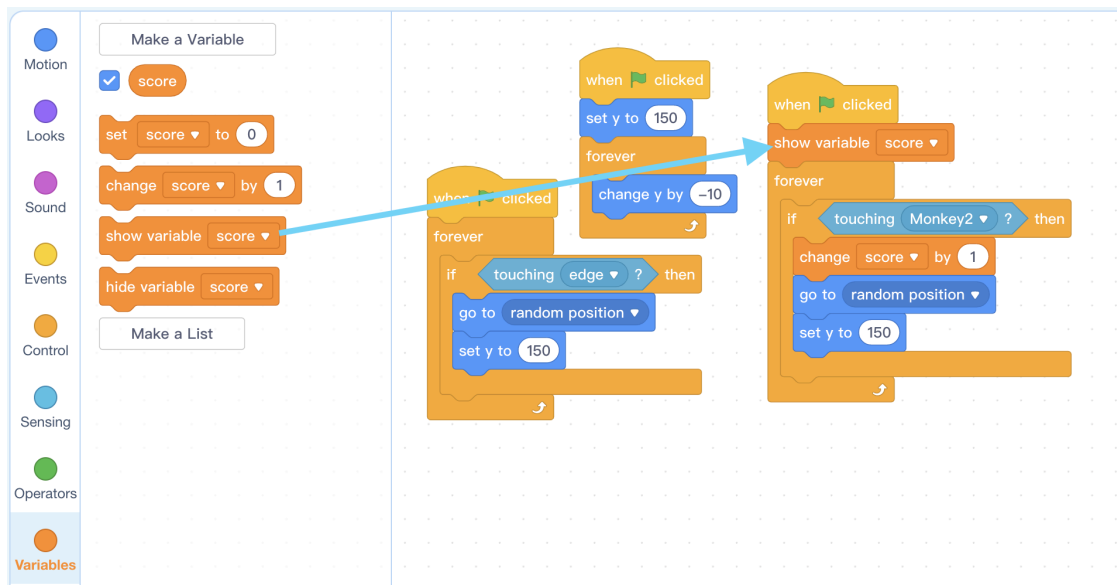
The score should increase when the banana touches the monkey.

From VARIABLES, drag "Change Score by 1" into body of "If touching Monkey2 then".
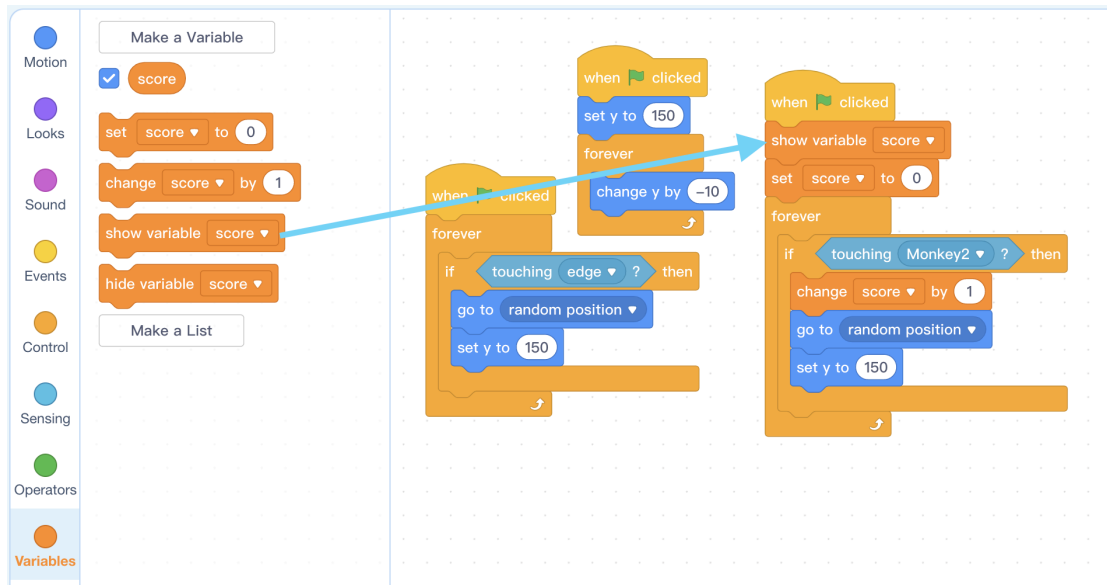
Next, we need to show the score on the screen.

From VARIABLES, drag "Show variable score" block to right under any "When Flag Clicked".

The score isn't set to 0 at the start of the game!

From VARIABLES, bring "Set score to 0" to right under the "Show variable score" block.

Press play and play the game. Yay! You are done!

[This is what your game should look like in the end!](#)