



***Programming:
Dodge the apples***

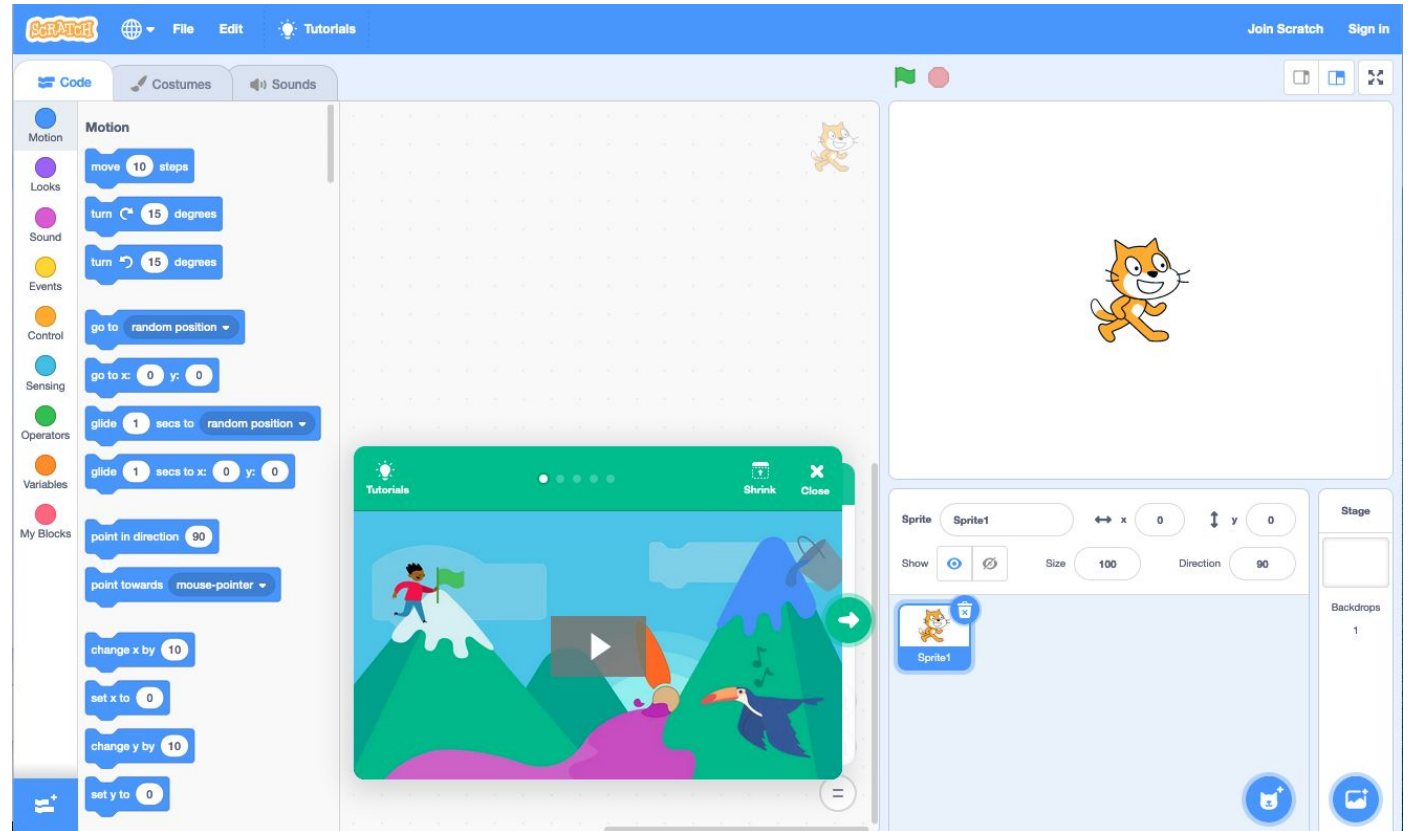
SCRATCH

Preparation:

To begin with, we need a blank screen. At the bottom right you sometimes see 'Sprite1' with an image of a cat. Remove it by clicking on the trash can in the top right corner.

You may see a green window on your screen. Close this by clicking on the cross in the top right corner.

Sometimes these two are not shown. In that case, you don't have to do anything and you can continue to the next slide.

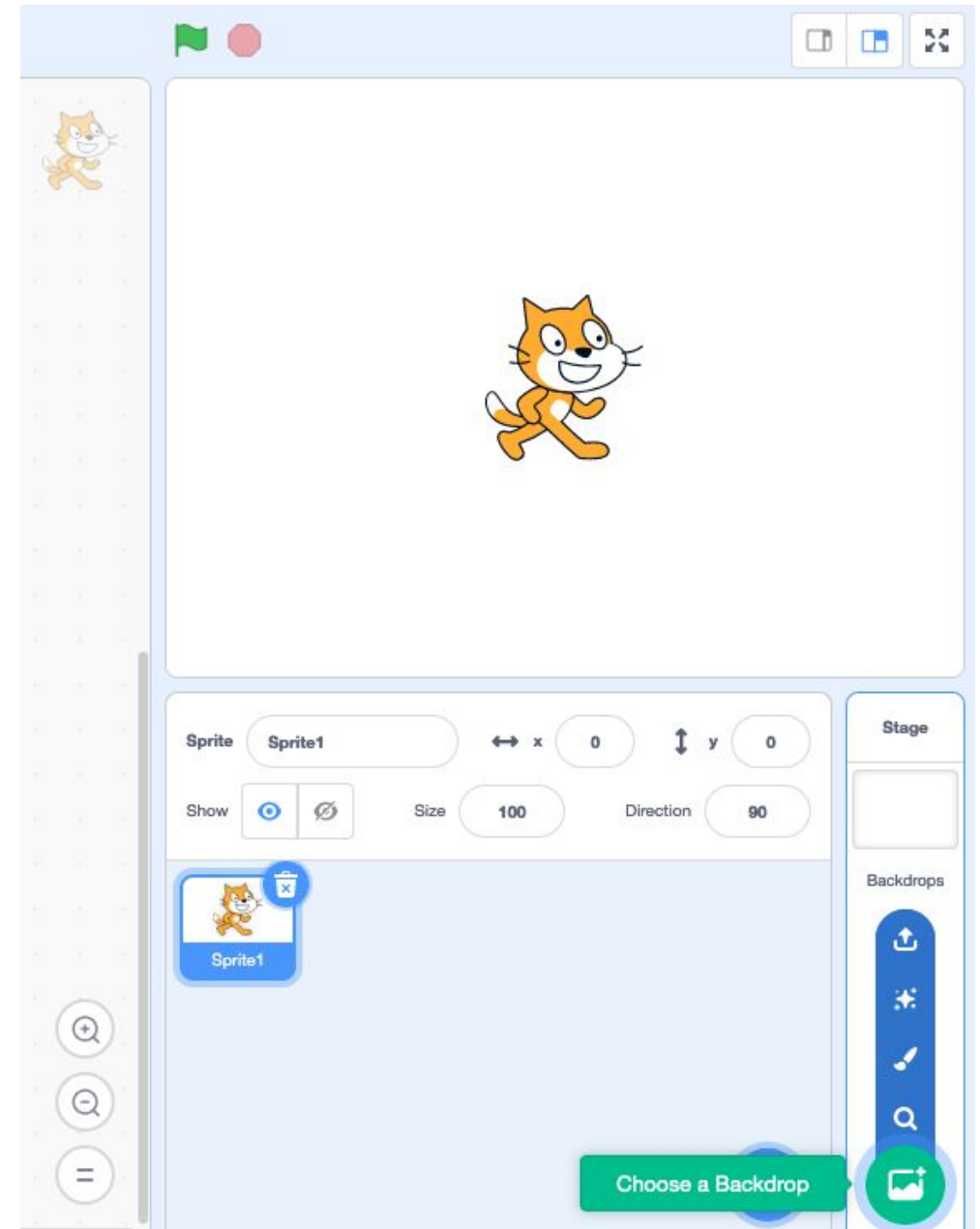




As a first step, we will
choose a background.

Click at the right bottom '**Choose a
backdrop**'.

Select '**Blue Sky**'.

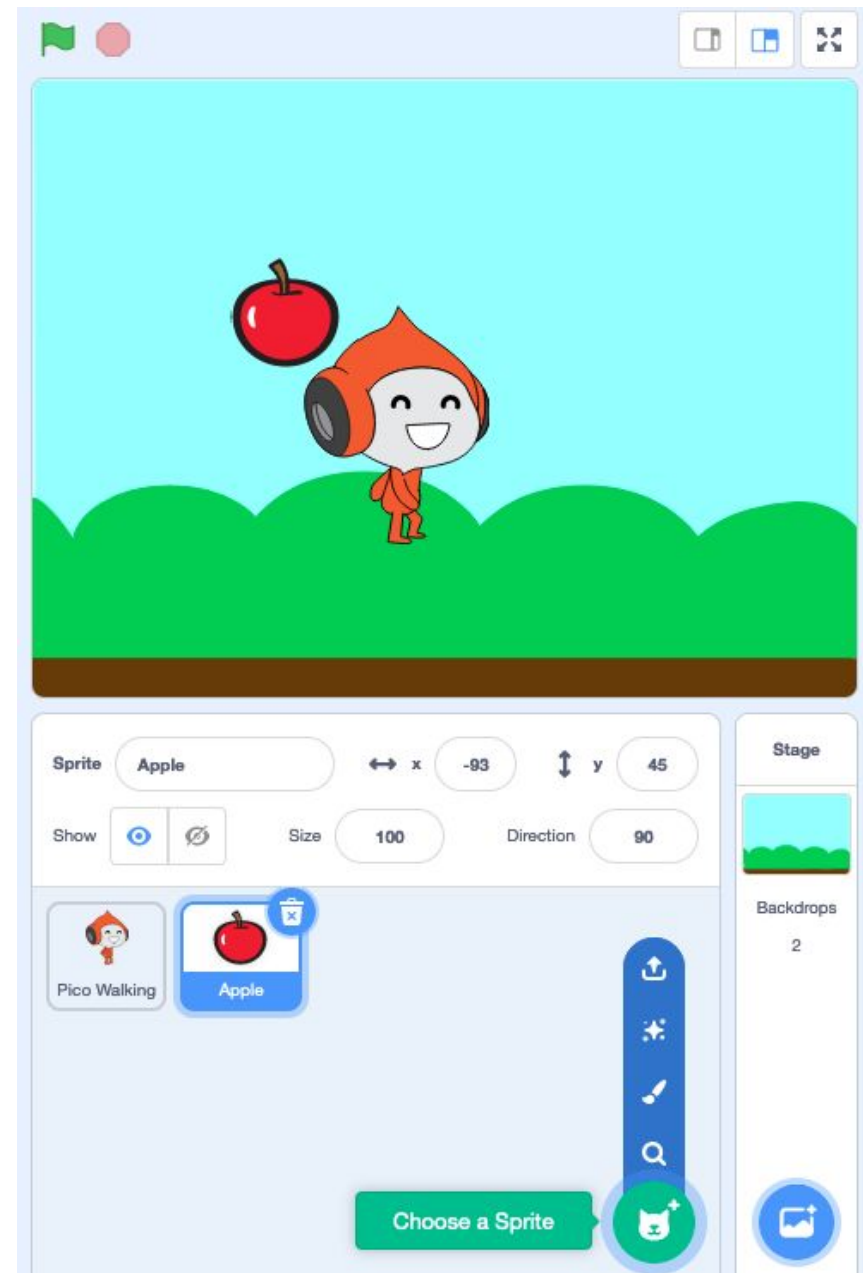




A sprite is an object in the game. We are going to make two sprites. First the character to control and then an apple that will fall down.

Click on '**Choose a Sprite**' and select '**Pico walking**'.

Click once more on '**Choose a Sprite**' and select '**Apple**'.



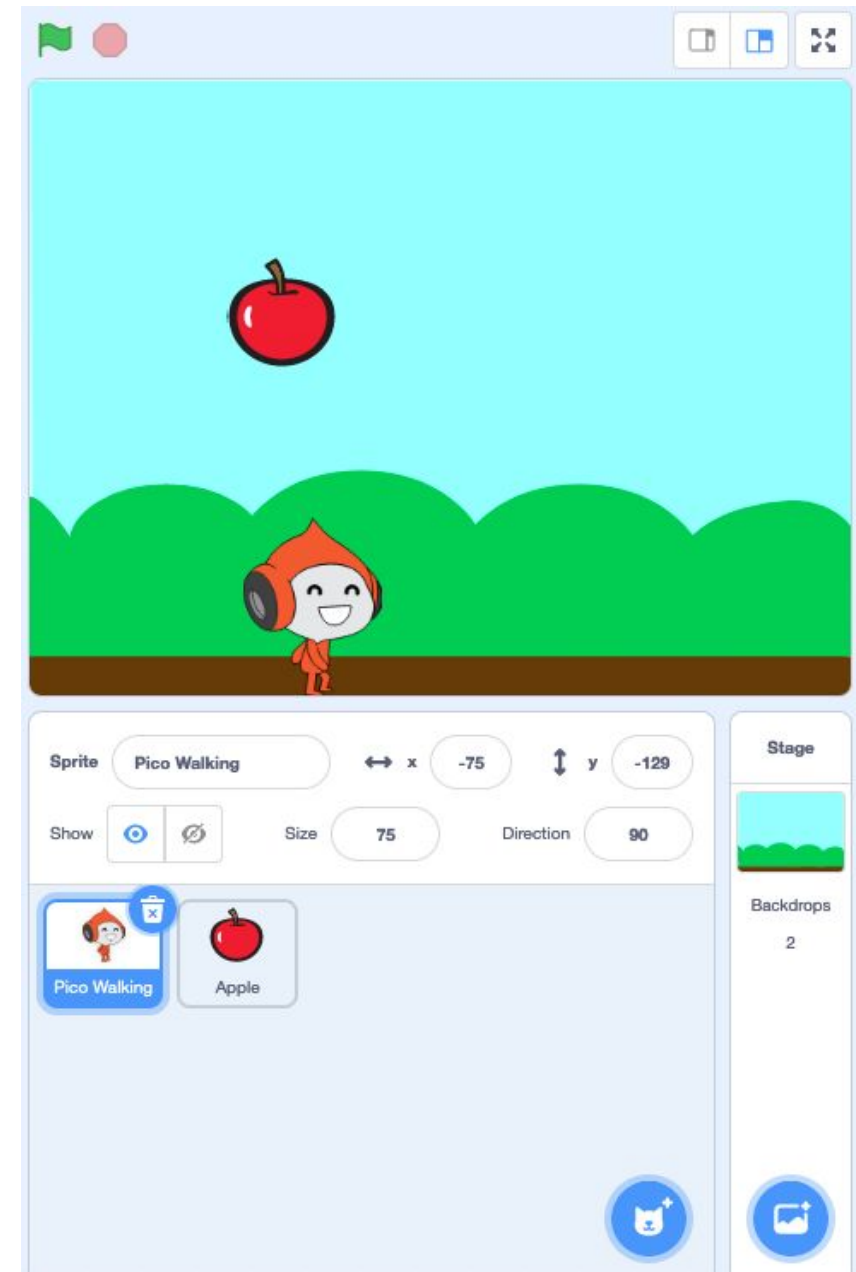
You can now select for which sprite you want to create code. We will start with '**Pico walking**'.

Select '**Pico walking**' so that it gets a blue border.

Put '**x**' on -75 en '**y**' on -129.

Change the size to 75.

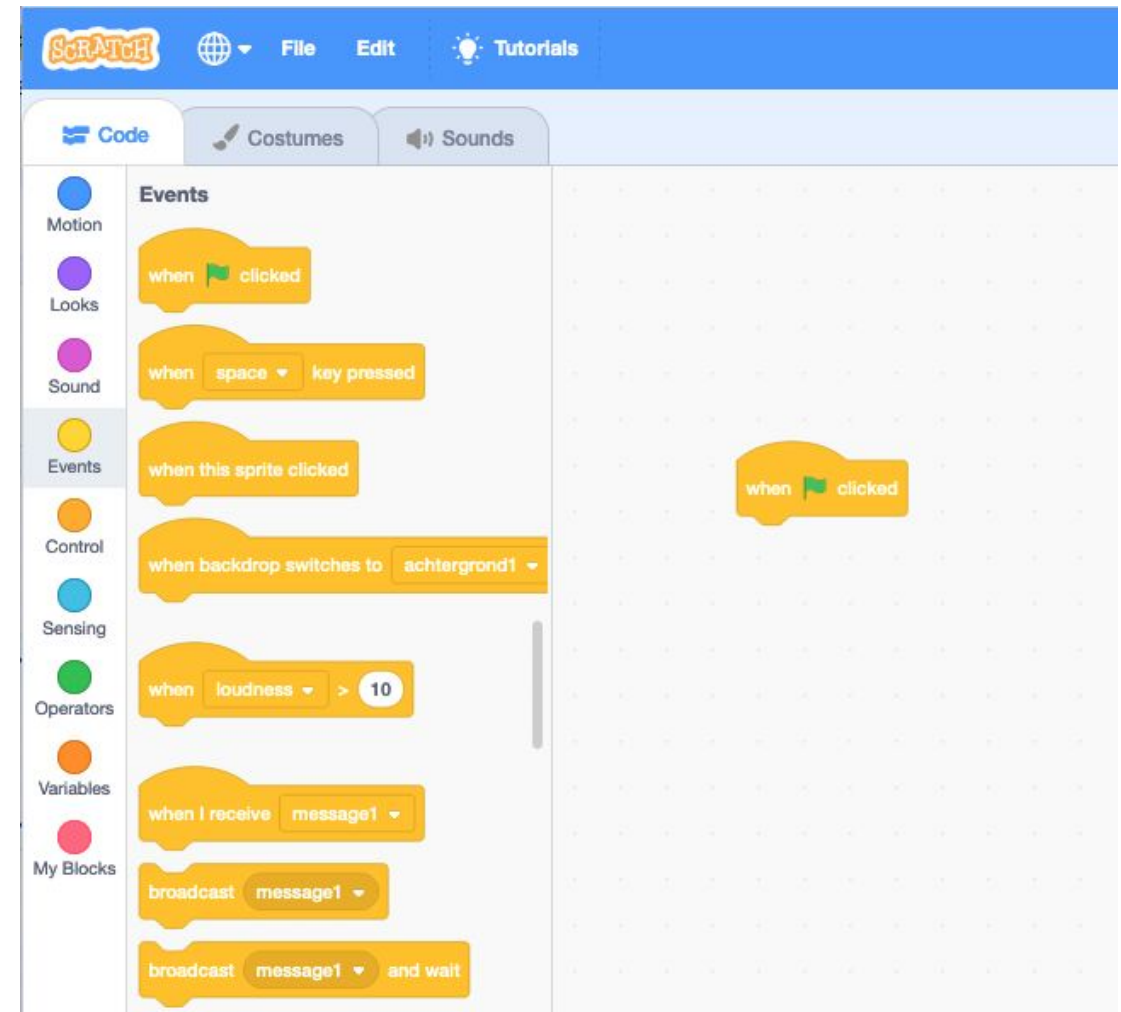
Now your character will be positioned on the ground.



You now have a character on your screen, but it's not moving yet. This is what we are going to do now.

Click on the 'Events' blocks.

Drag the block 'when the flag clicked' to the workspace in the middle.



Click on the '**Control**' blocks.

Drag the block '**forever**' to the workspace and place it beneath the previous block.

Then you drag the block '**if then**' twice to the workspace and place these within the previous block.



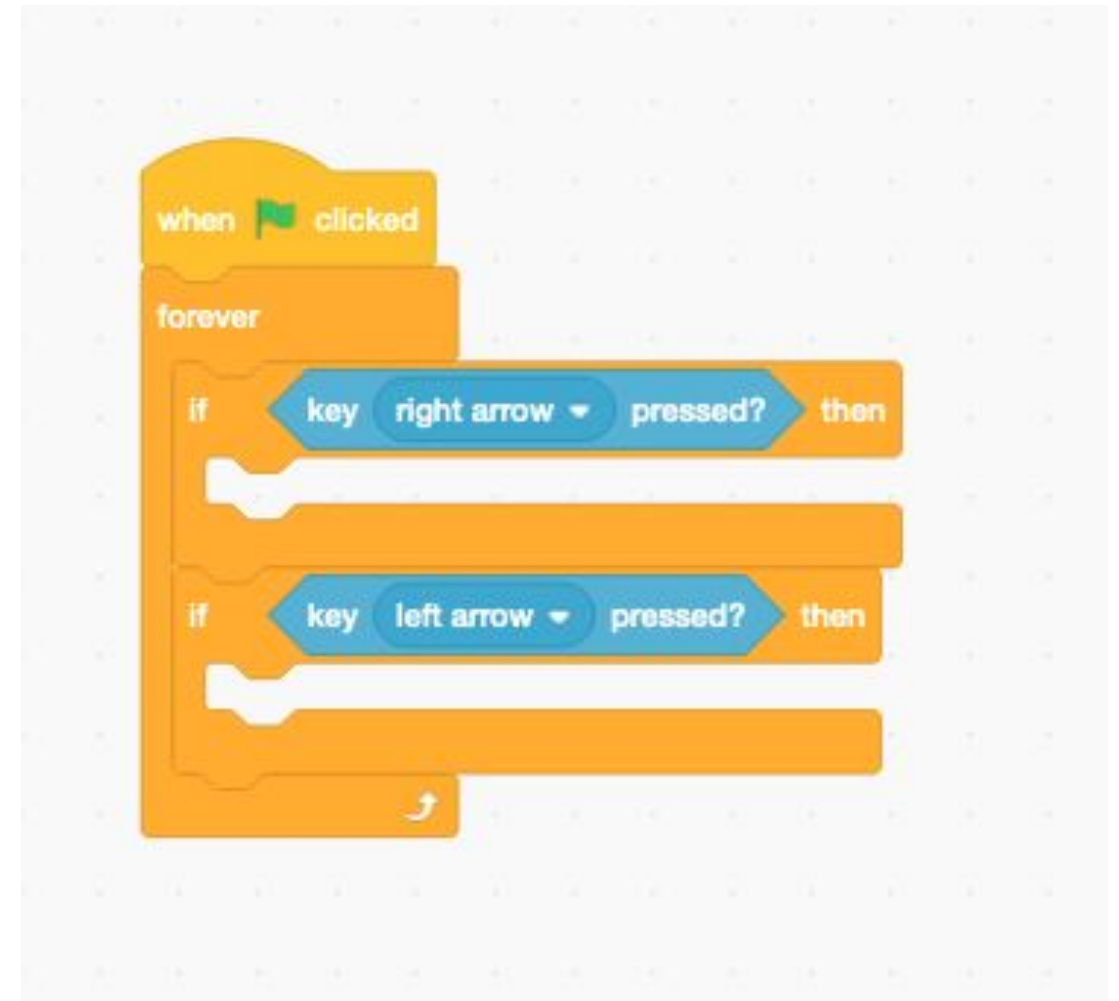
Click on the '**Sensing**' blocks.

Drag the block '**key space pressed?**' between the ('if then') block.

Click on the ▼ sign and choose '**right arrow**'.

Then drag the block '**key space pressed?**' between the ('if then') block.

Click on the ▼ sign and choose '**left arrow**'.



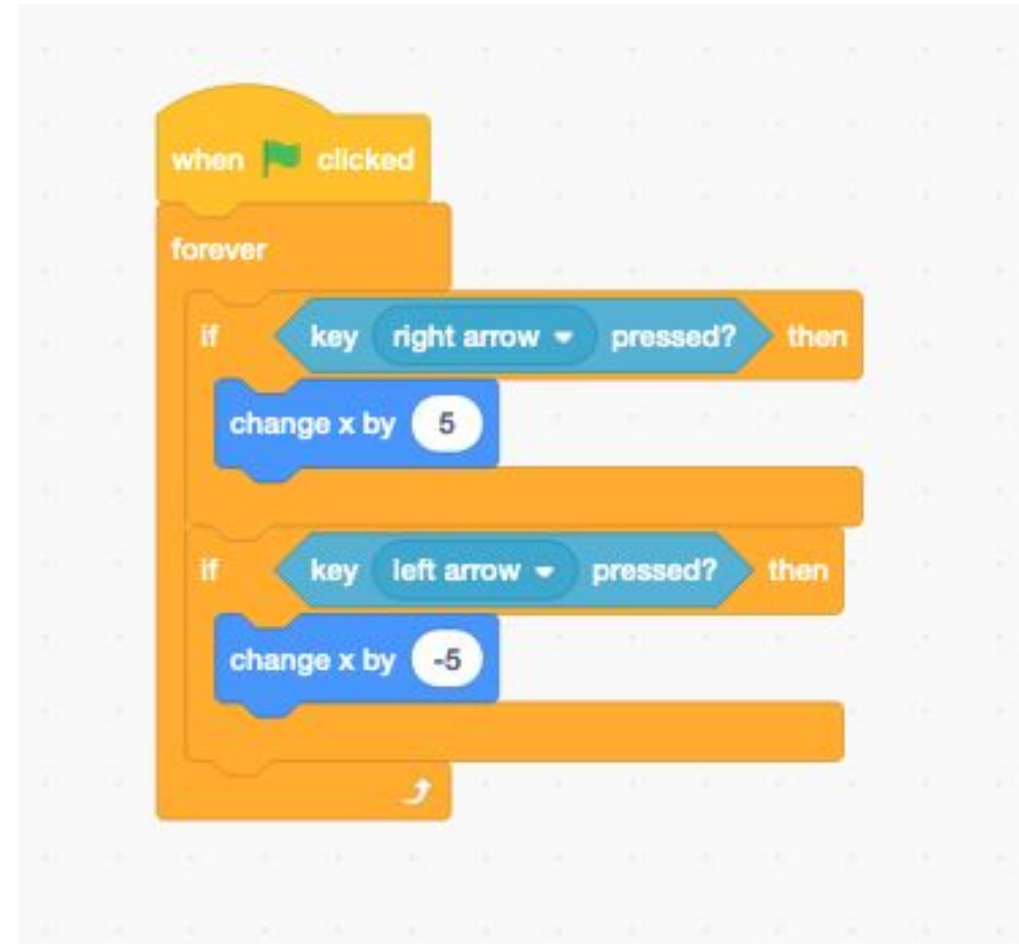
Click on 'Motion' blocks.

Drag the block 'change x by 10' to the workspace and beneath 'key right arrow pressed?'.

Then change the 10 to a 5.

Then drag the block 'change x by 10' to the workspace beneath 'key left arrow pressed?'.

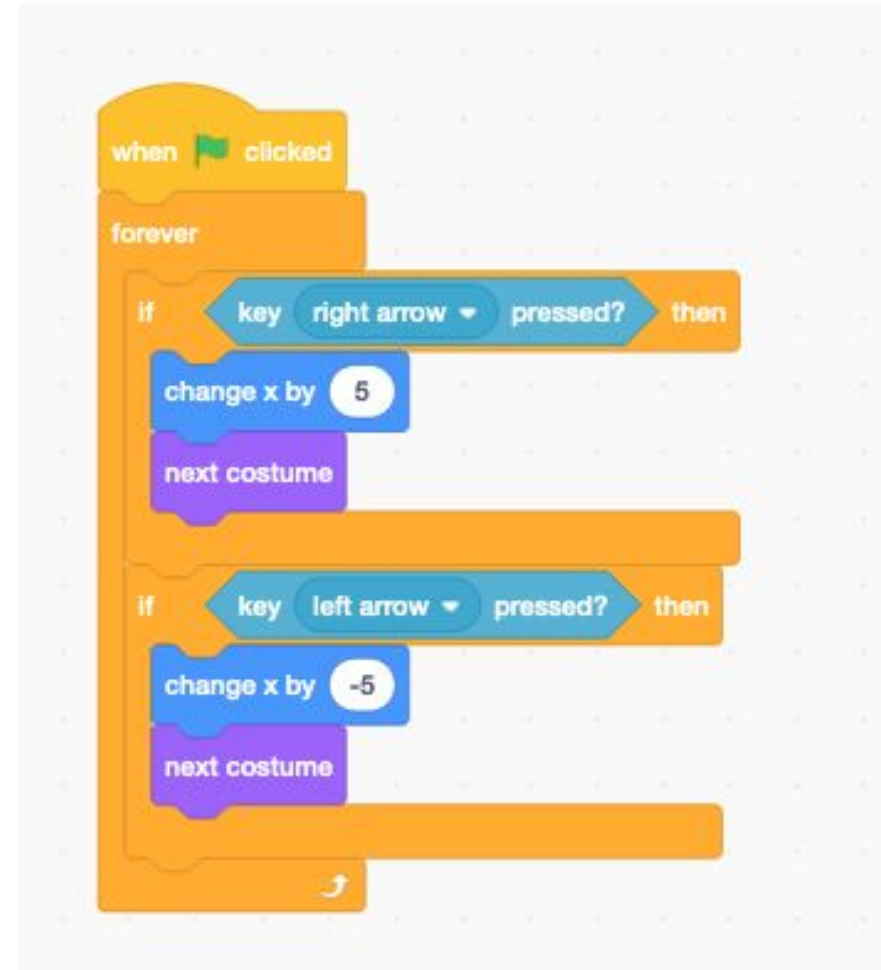
Then change the 10 to a -5.



Click on 'Looks' blocks.

Drag the block 'next costume' to the workspace and place it beneath 'change x by 5'.

Then drag the block 'next costume' to the workspace and place it beneath 'change x by -5'.



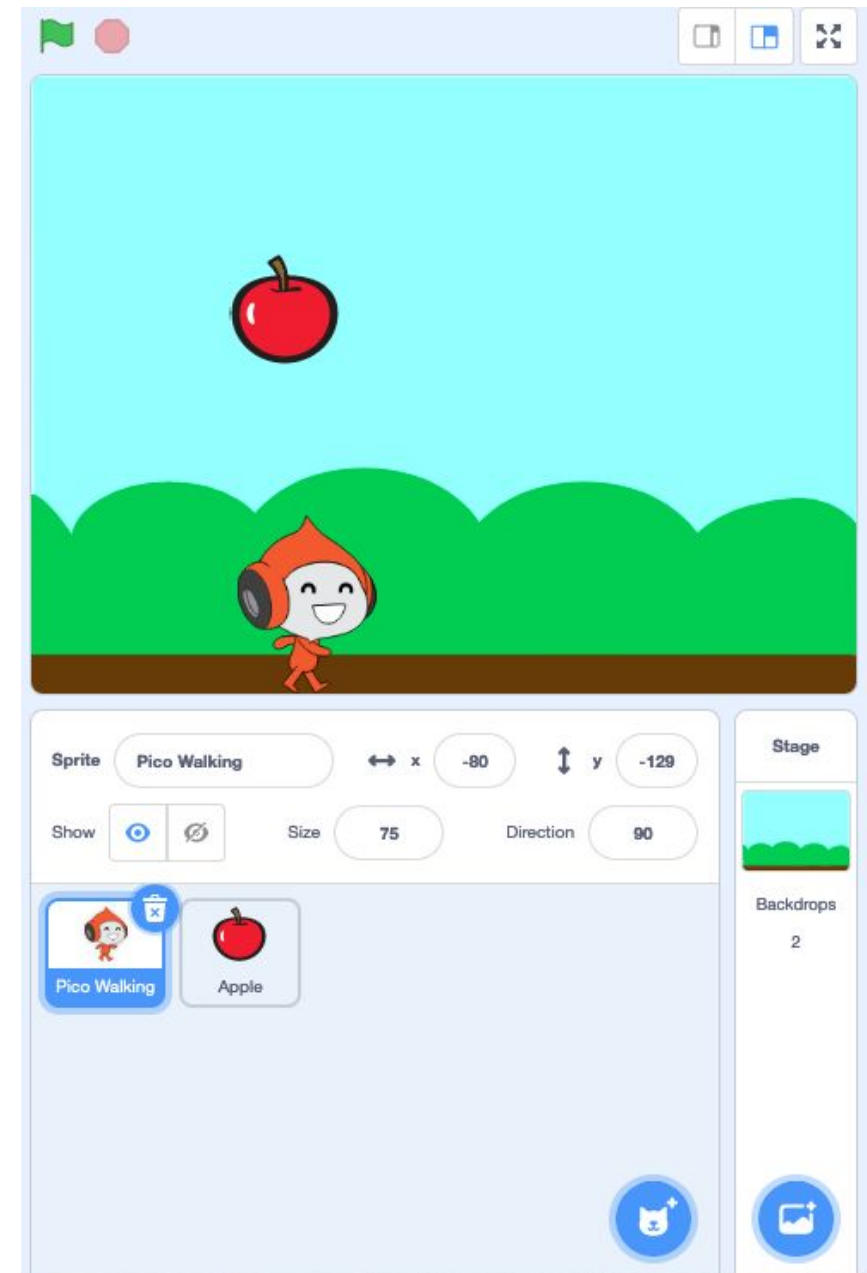


When you click on the **green flag** you will be able to move your character by clicking on the **right arrow** and the **left arrow** of your keyboard.

Give it a try.

As you can see, the apples are not falling from the sky yet. We will fix that now.

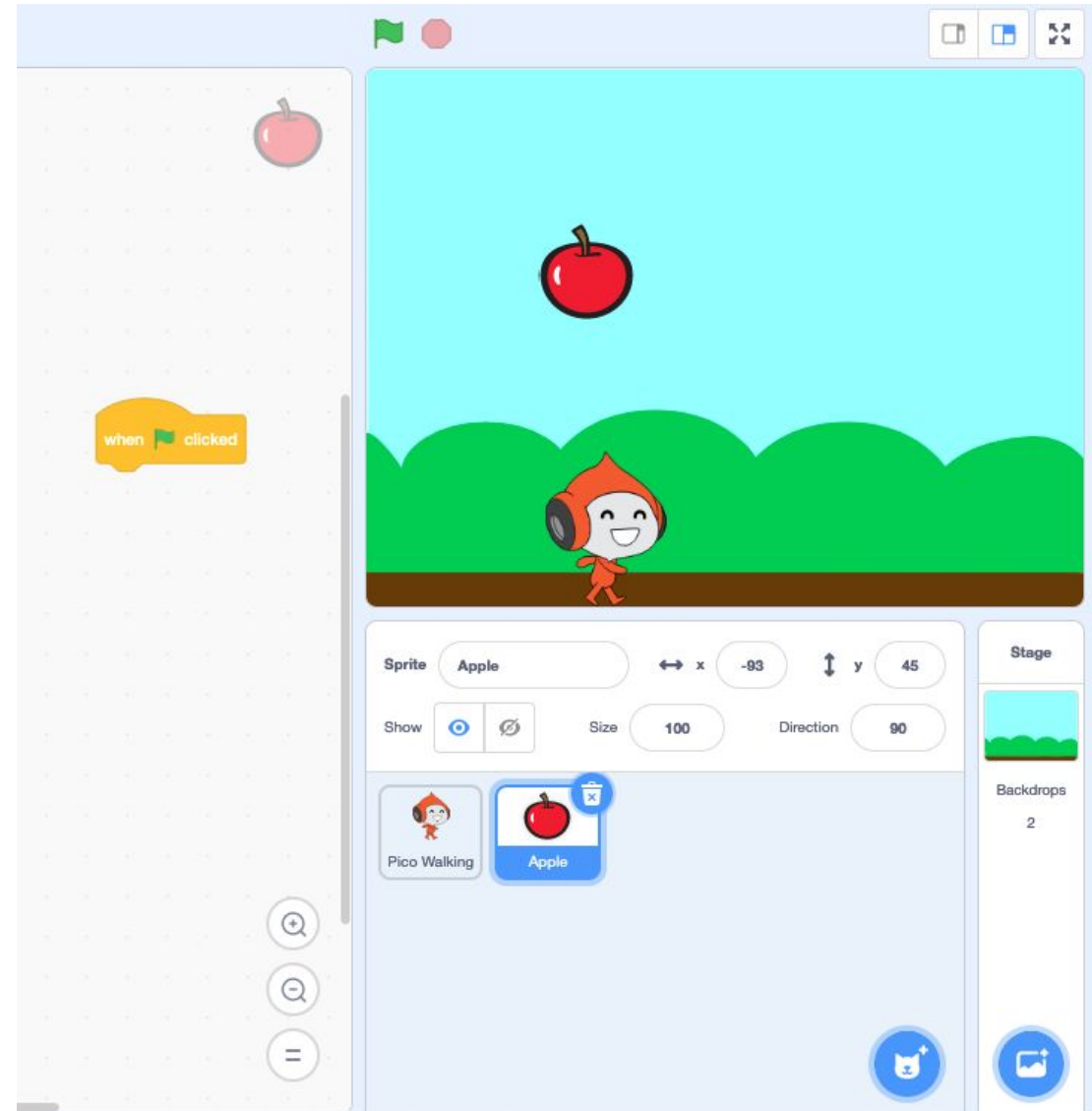
Before doing that, we will need to stop the game first. Click on the **red stop** button next to the green flag.



Click on the apple at the right bottom of your screen.

Click on the **Events'** blocks.

Drag the block 'when the flag clicked' to the workspace in the middle.





Click on 'Variables' blocks.

Click on 'Make a variable' and give it the name 'lives'.

You will see two radio buttons. Here you can decide if the variable is available to all sprites or just this one.
Choose
'For all sprites'.

Drag the block 'set lives to 0' to the workspace and place it beneath the previous block.

Then change 0 to 5.

The screenshot shows the Scratch IDE interface. On the left, the 'Variables' block is selected in the 'My Blocks' category. The 'Variables' block menu is open, showing options like 'Make a Variable', 'lives', 'set lives to 0', 'change lives by 1', 'show variable lives', and 'hide variable lives'. The 'New Variable' dialog box is open, showing the 'New variable name:' field with 'lives' entered. The 'For all sprites' radio button is selected, and the 'OK' button is highlighted.

Click on '**Motion**' blocks.

The numbers in the blocks will vary for each user. That is why this slide we have changed the number to a '*'.

Drag the block '**set y to ***' to the workspace and place it beneath the previous block.

Then change * to 140 for Y.

Then drag the block '**set x to ***' to the workspace and beneath the previous block. You don't have to change the number just yet.



Click on '**Operators**' blocks.

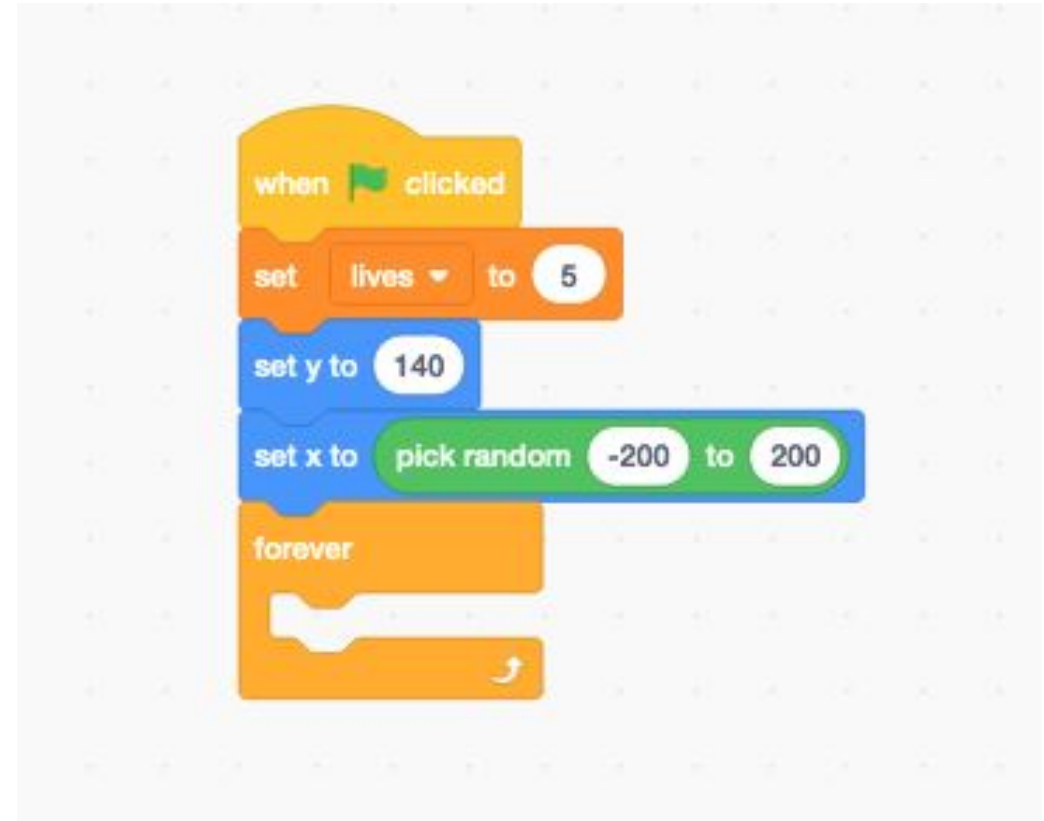
Drag the block '**pick random 1 to 10**' to the workspace and place it within the block '**set x to ***'.

Then change 1 to -200 and 10 to 200.



Click on '**Control**' blocks.

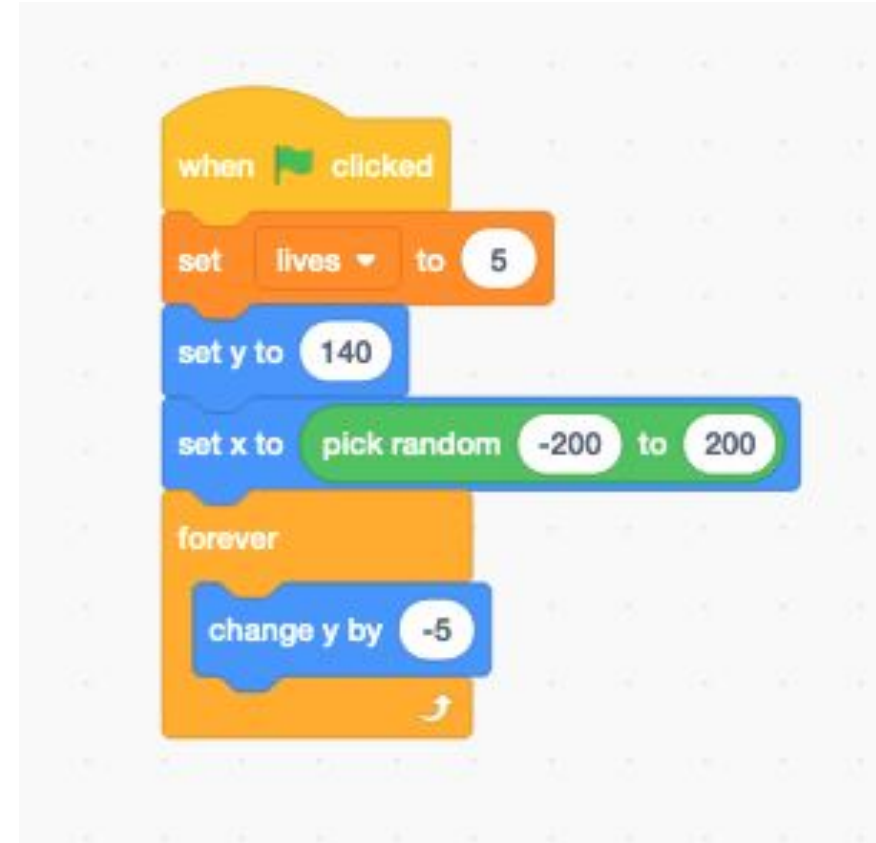
Drag the block '**forever**' to the workspace and place it beneath the previous block.



Click on '**Motion**' blocks.

Drag the block '**change y by 10**' to the workspace and place it within the previous block.

Then set 10 to -5.

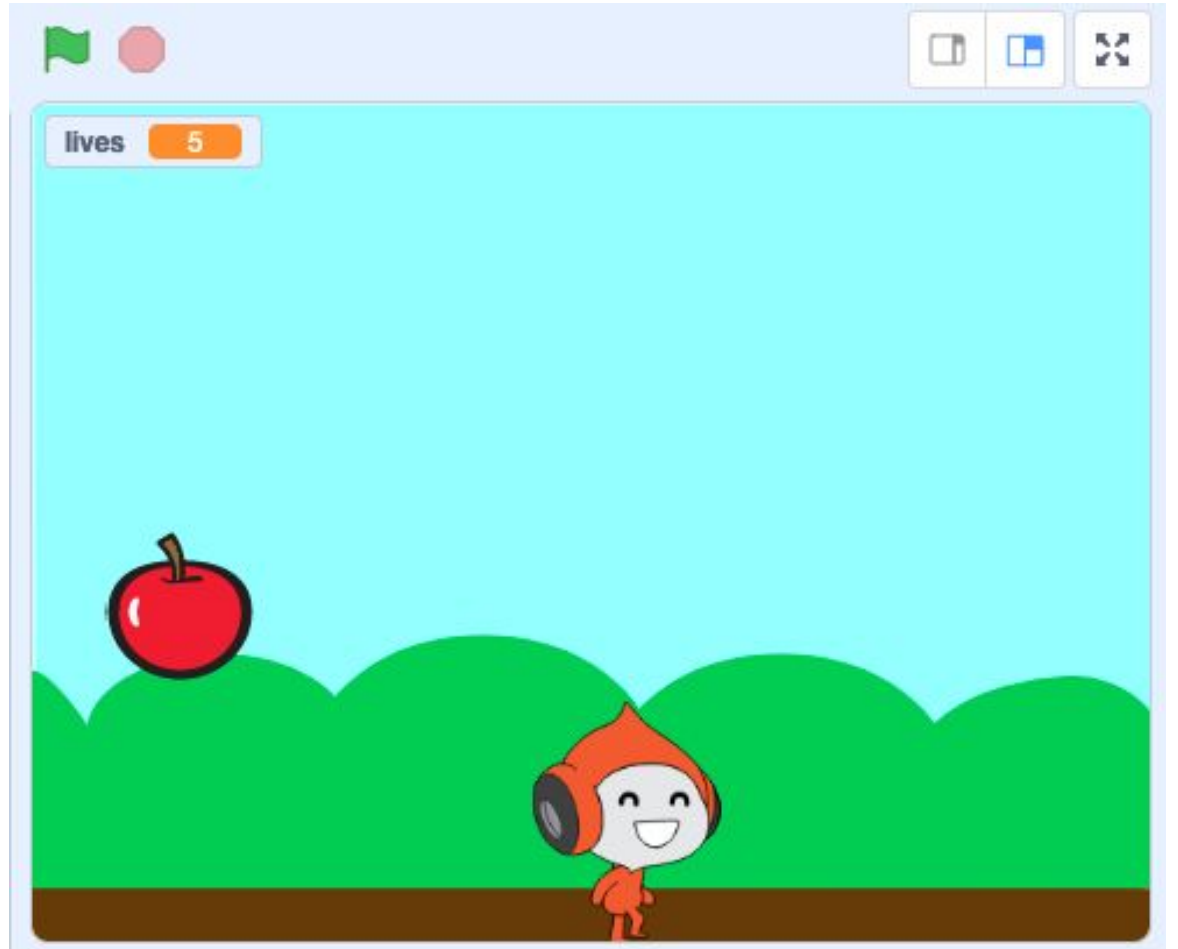




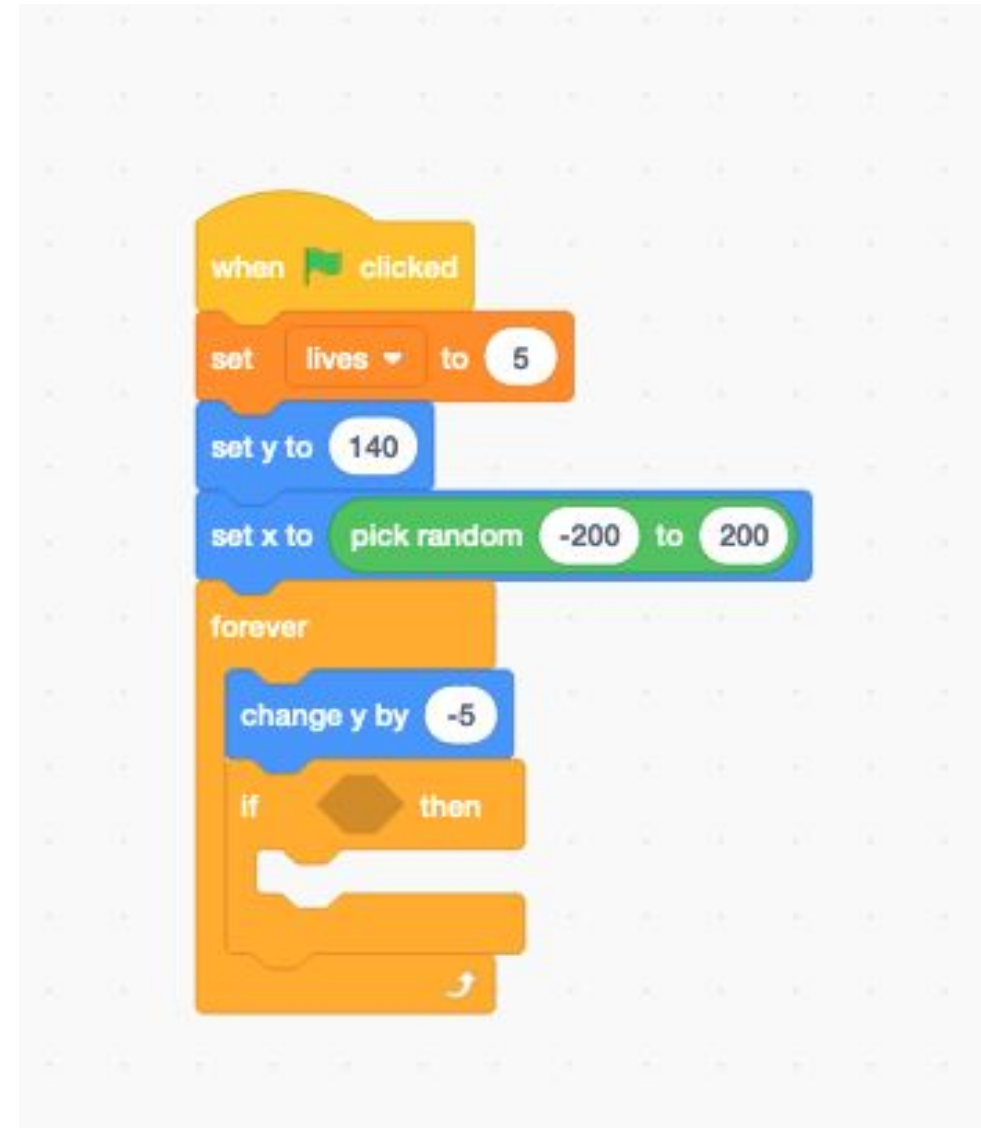
Now when you press on the **green flag** you will be able to move the character with the **right arrow** and the **left arrow** of your keyboard. The apple will also fall from the sky.

Give it a try.

As you can see, the apple fall from the sky, but then they disappear and stop. This is what we will be fixing now.



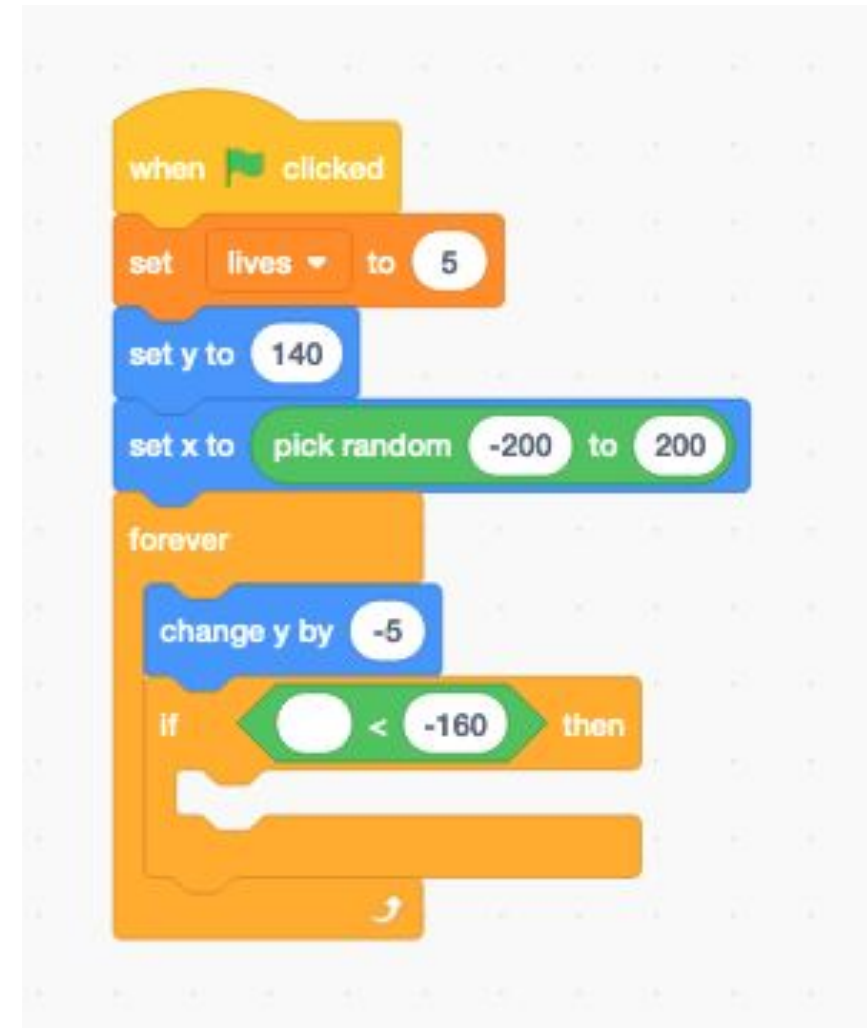
Click on '**Control**' blocks.
Drag the block '**if <...> then**' to the workspace and place it within the forever block, beneath the change y by -5 block.



Click on 'Operators' blocks.

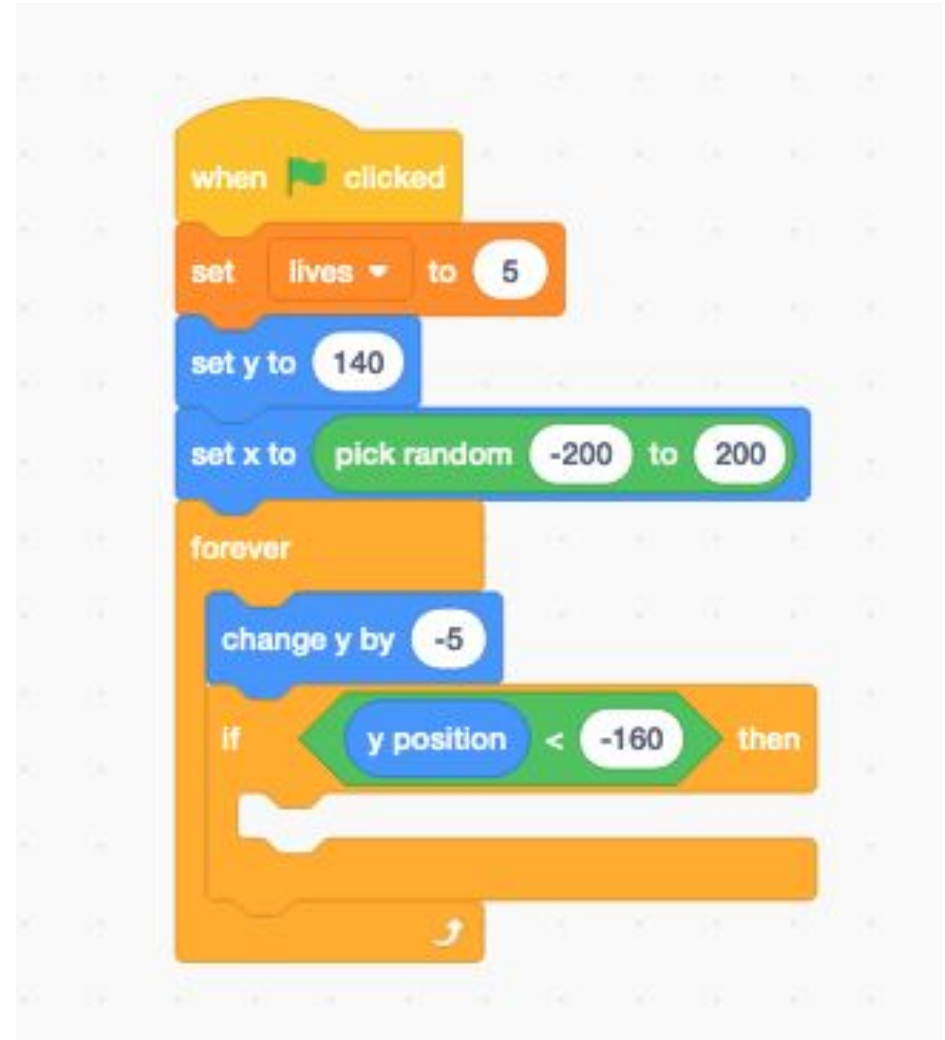
Drag the block ' $\cdot < 50$ ' to the workspace and place it in the 'if $< \dots >$ then' block.

Then set 50 to -160.



Click on '**Motion**' blocks.

Drag the block '**y position**' to the workspace and place it within the '**.. < -160**' block.

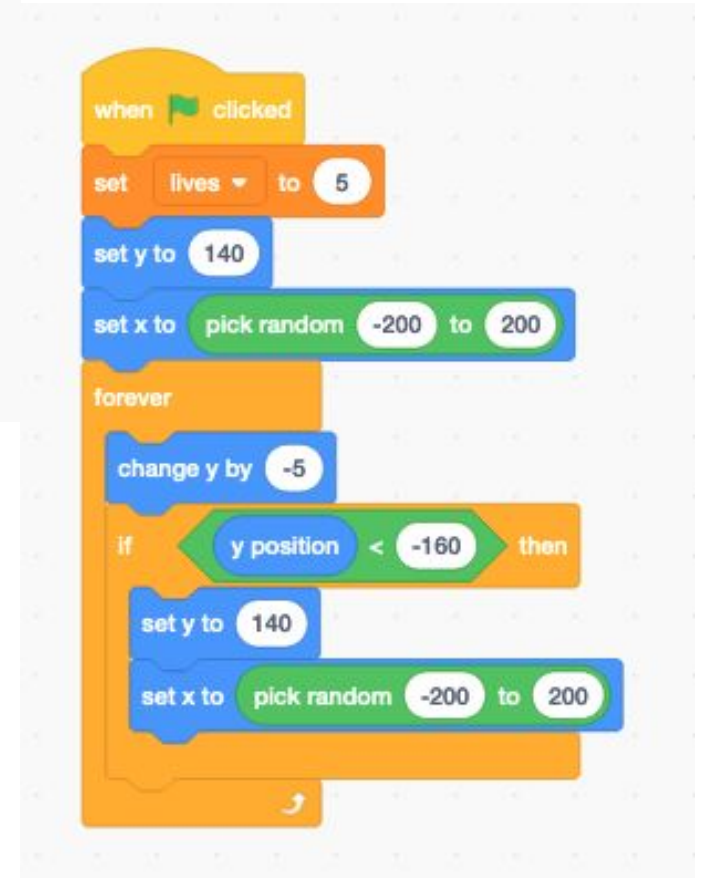
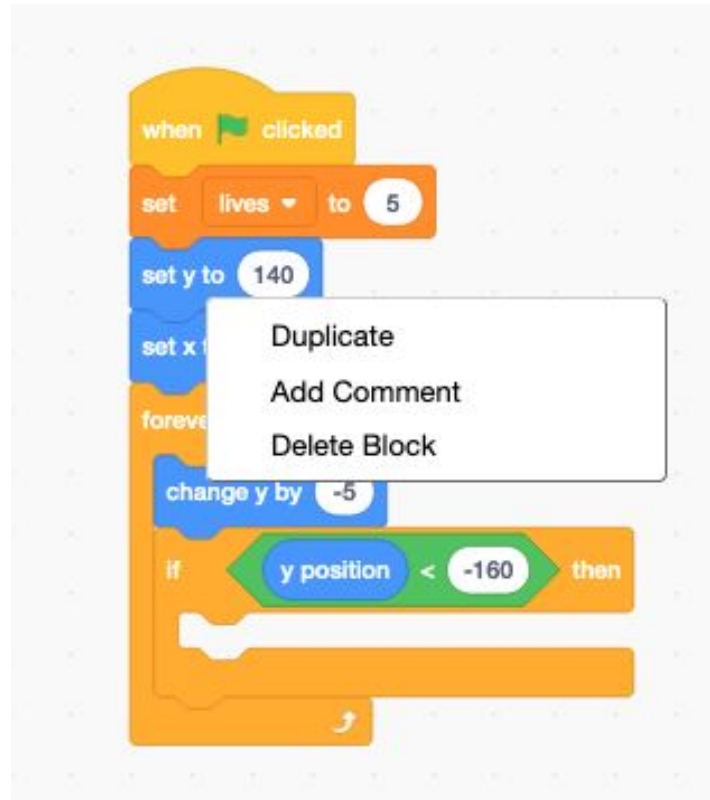


For this step we will need blocks that we have used before. You can create copies of a block by right clicking on a block with your mouse. You will be making copies of everything that lies beneath the selected block.

Create a copy of the block 'set y to 140'.
Remove the forever block (including everything that is within it) so that you are only left with the two blue blocks.

What is left are the blocks 'set y to 140' and 'set x to pick random -200 to 200'.

Place them within the block 'if y-position < -160 then'.

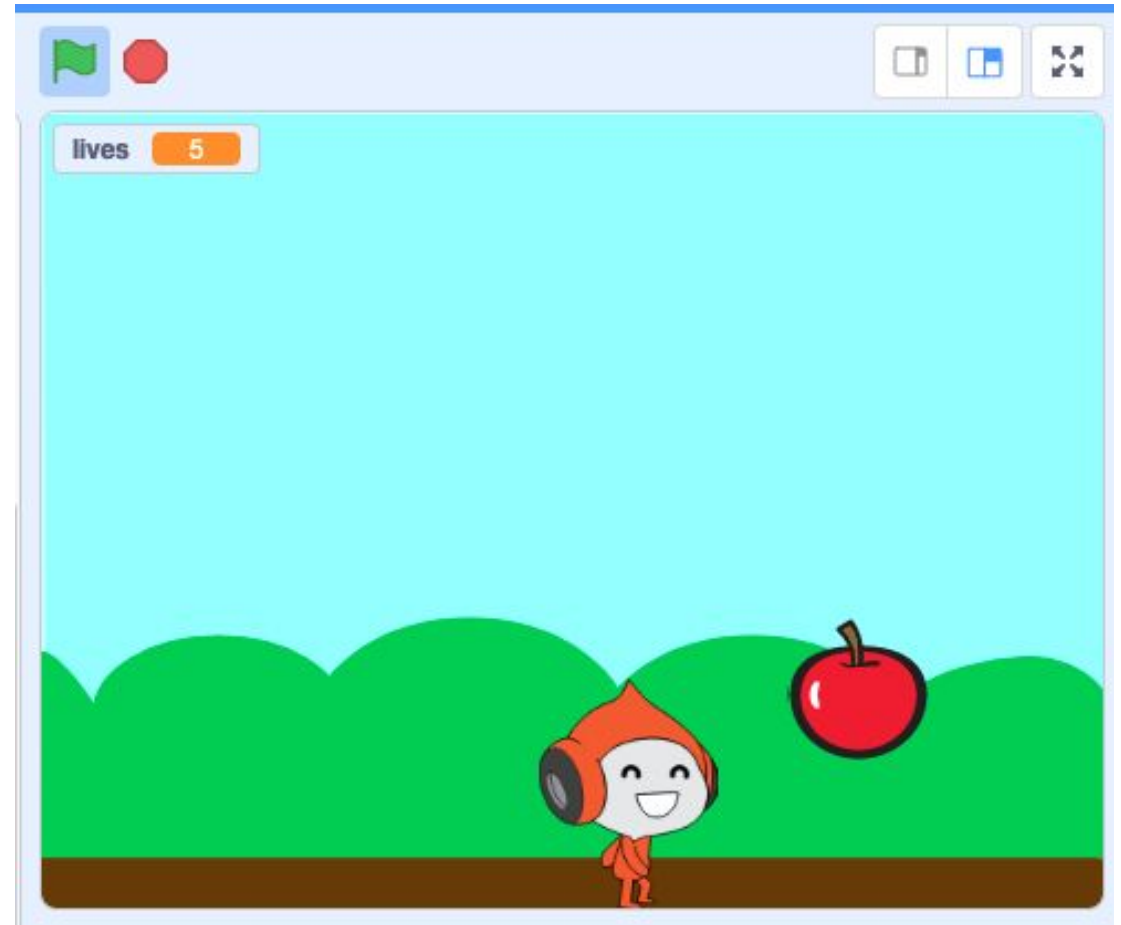


Now when you click on the **green flag** you will be able to move your character with the **right arrow** and **left arrow** of your keyboard. The apple is falling down and once it hits the ground, a new apple will start falling.

Give it a try.

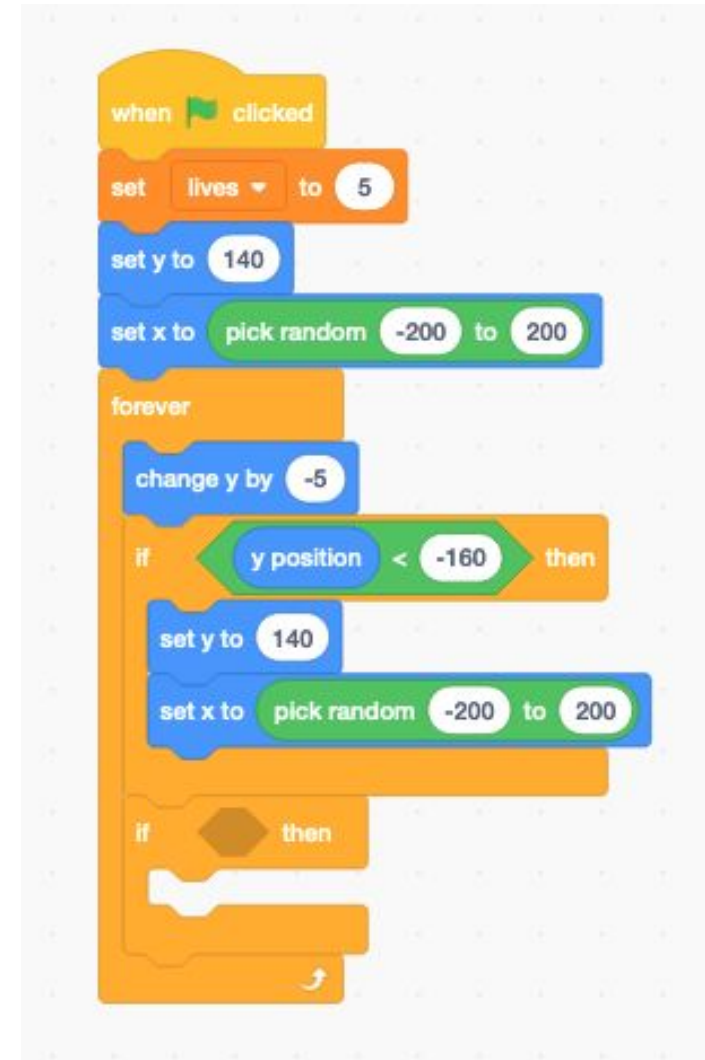
Still, when the character touches an apple nothing happens. This is what we will work on next.

Stop the game by clicking on the **red button** next to the green flag.



Click on the '**Control**' blocks.

Drag the block '**if <...> then**' to the workspace and place it within the forever block beneath the previous '**if <...> then**' block.



Click on the 'Sensing' blocks.

Drag the block 'touching mouse-pointer?' to the workspace and place it within the previous 'if <..> then' block.

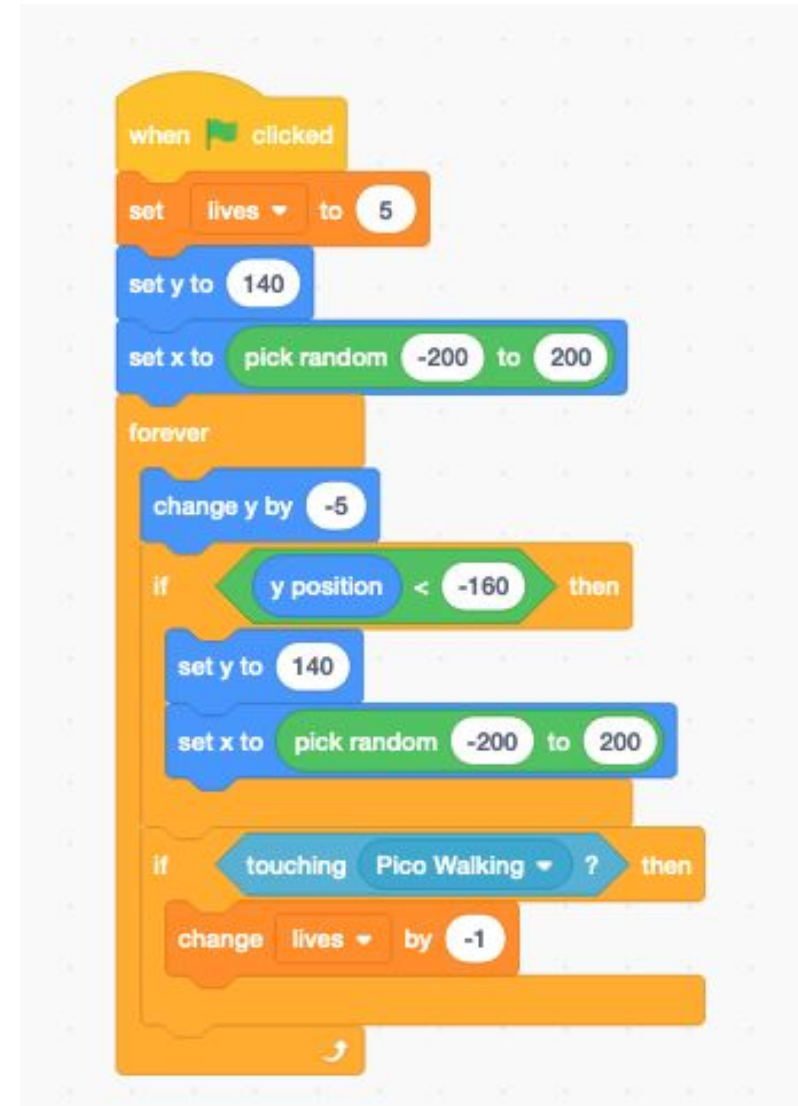
Click on the ▼ sign and select 'Pico walking'.



Click on the '**Variables**' blocks.

Drag the block '**change lives by 1**' to the workspace and place it within the '**if touching Pico walking then**' block.

Then change the 1 to -1.



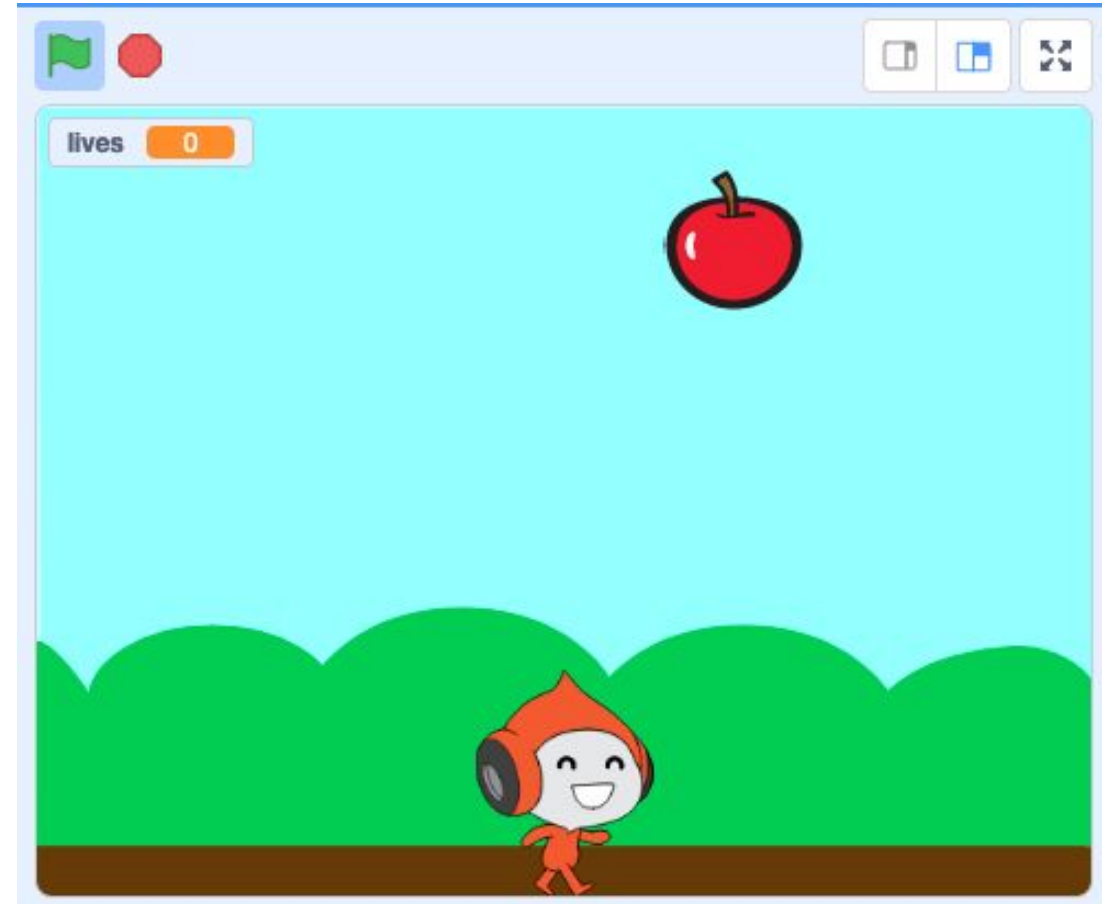
Then create a copy of the
'set y to 140 and 'set x to pick random
-200 to 200' and place it after
'change lives by -1'.



When the character gets hit by an apple, the number of lives will be subtracted by 1.

After that, an apple will appear again in the sky starts falling down again. We still need to make one adjustment in between.

We are going to add a check to see if the number of lives is equal to 0. If this is the case, then we stop the game.



Go to '**Control**' and drag a '**if <> then**' block beneath the '**change lives by -1**' block. Place it just above the other blue blocks.

Drag the '**stop all**' block and place it inside the previous block. This will make sure that everything stops as soon as the '**if <> then**' block is true.

Go to '**Operators**' and drag a '**.. = 50**' in between the **if** and **then**. Change the 50 to 0.



The final step is to put our own variable 'lives' into the operator.

Go to '**Variables**' and click on lives.
Drag this to the space before the
'.. = 0'.





If you click on the **green flag** your character will be able to move using the **right arrow** and **left arrow** of your keyboard. The apple falls from the sky and as soon as it hits the ground a new apple will fall from the sky.

If the apple touches your character, one life will be subtracted from the total number of lives.

Once the number of lives becomes 0, the game is over.

Give it a try!



This is the end of the assignment.