



Scratch Programming

Topic 1.5

Interactive story – Cat Vs Mouse

Presented by Advaspire Team

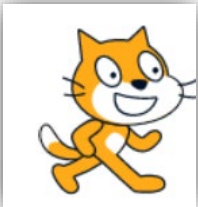


Review Last Topic – Starting Scene

Script:

```
when clicked
  go to x: -273 y: -67
  repeat 35
    move 5 steps
  say 'Hi Doggy!' for 1.5 seconds
  broadcast message1
```

Motion

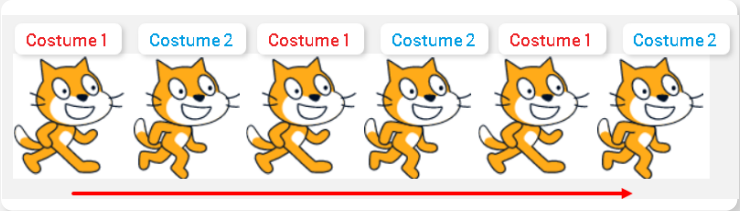


```
when clicked
  repeat 8
    next costume
    wait 0.1 seconds
  switch costume to costume1
```

Animation

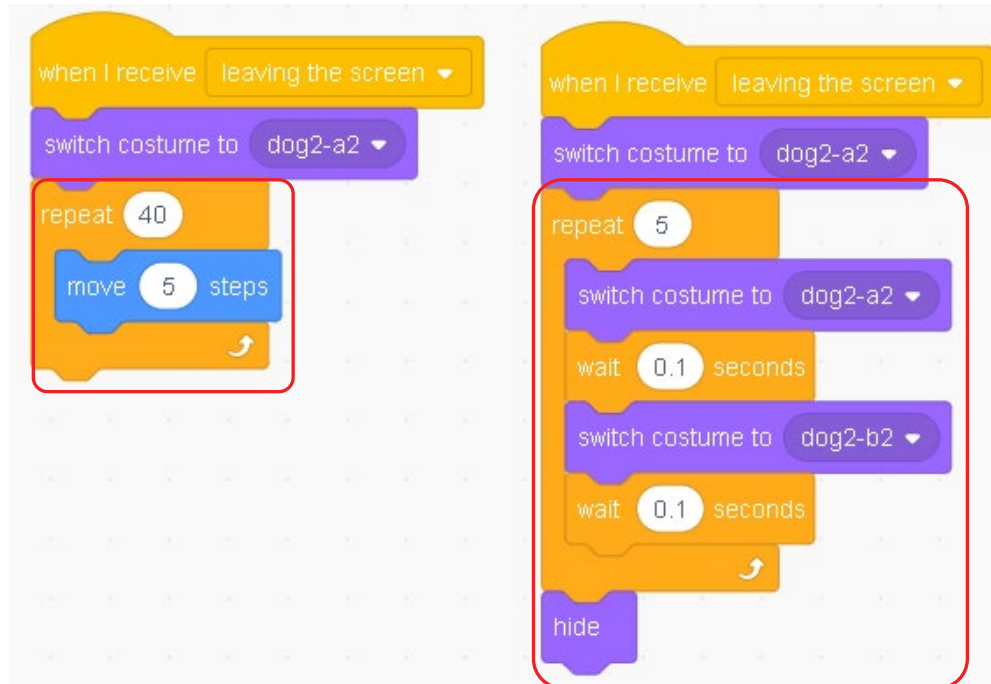
I will add another event next to the first event, which is to animate the cat.

This is like making the frames of animation and make the cat like moving its leg, and here I want to make sure the last frame stops at costume 1.



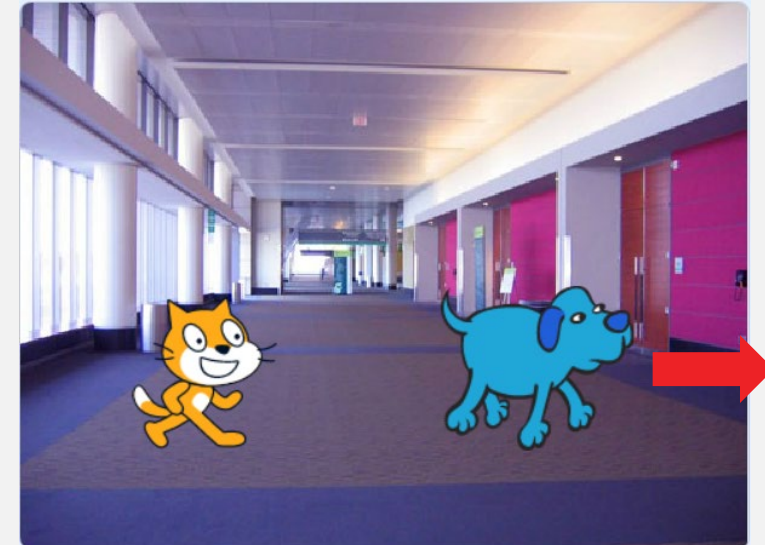
Review Last Topic – Move out scene

Script:



Motion

Animation



Then the dog will move out from the screen with walking animation.

After my dog fully reach the edge of the stage, it will hide itself. Basically it's the same concept as the cat's script.



Review Last Topic – Put show at start

Script:

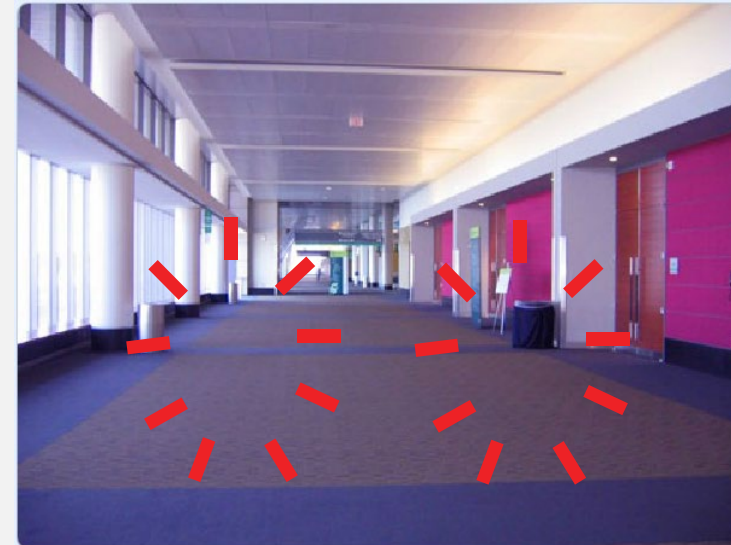


```
when green flag clicked
show
go to x: -273 y: -87
repeat (35)
  move 5 steps
say Hi Doggy! for 1.5 seconds
broadcast message1
```

Script:



```
when green flag clicked
go to x: 74 y: -56
show
switch costume to dog2-a
```

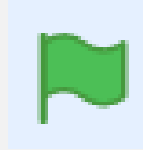
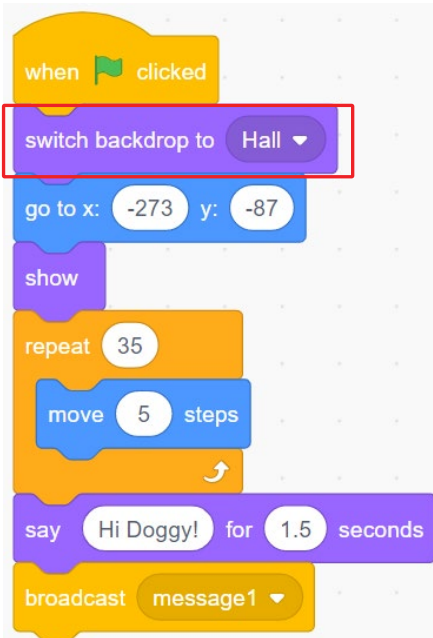


As I hide them at the end when they left the screen, so I need to fix their starting position and put a “show” block after “flag” is clicked so that they will reappear if you click “go” or “flag”



Review Last Topic – Set up starting backdrop

Script:



If we don't put a switch backdrop (Starting Backdrop) block, it won't go back to the first scene after you clicked the flag again. So this part is to set the starting scene for your story.



Today's Topic

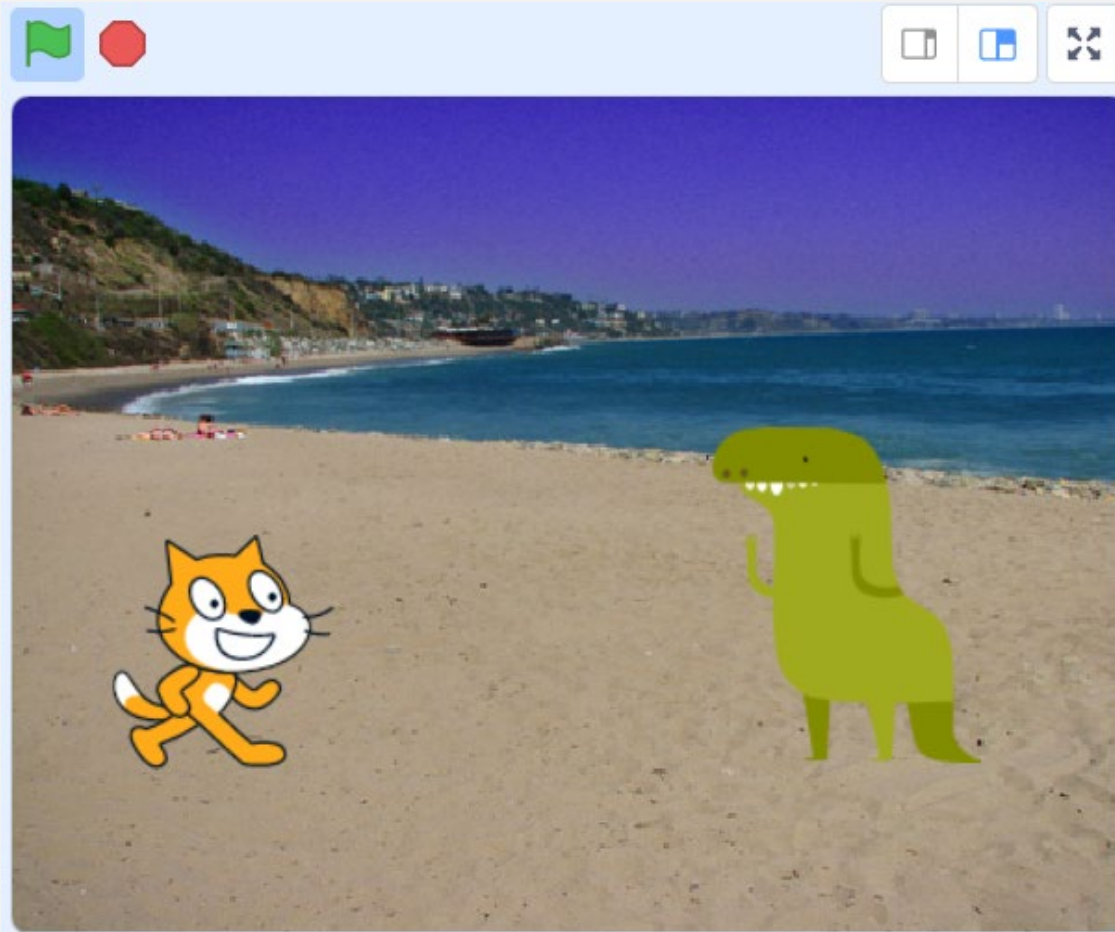
1. Interaction Story with Key Pressed
2. Change X & Y vs Move Step
3. Forever-if Loop
4. Glide to Position



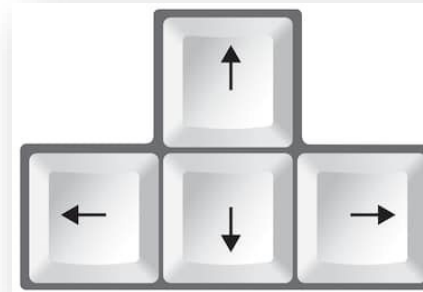
Learning Outcome

- 1. Able to make interactive animation story with key pressed**
- 2. Able use forever-if loop for sensing purpose**
- 3. Understand the application of Change x & y and Move steps**

Interactive Story - Key Pressed



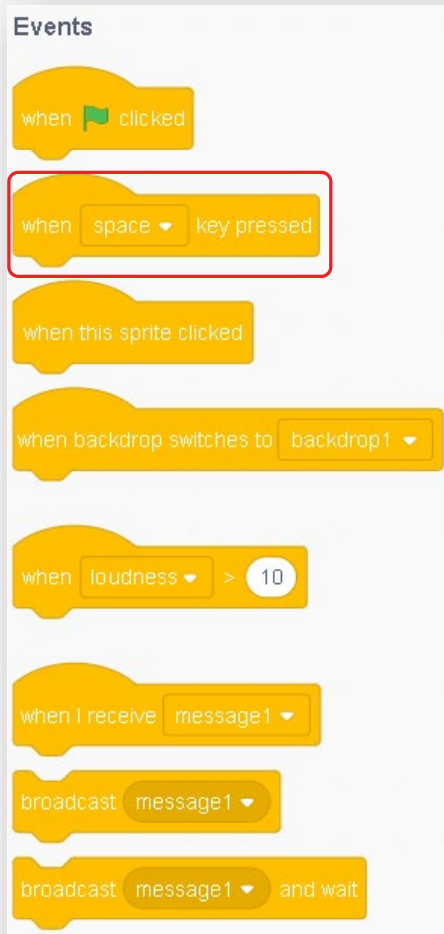
Keyboard - Arrows



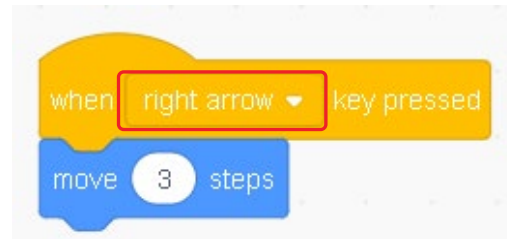
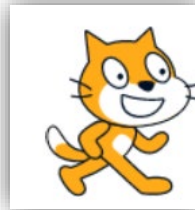
This time, we are going to make the cat to move with keyboard (arrow buttons) pressed



Event – When “button” key pressed



Script:

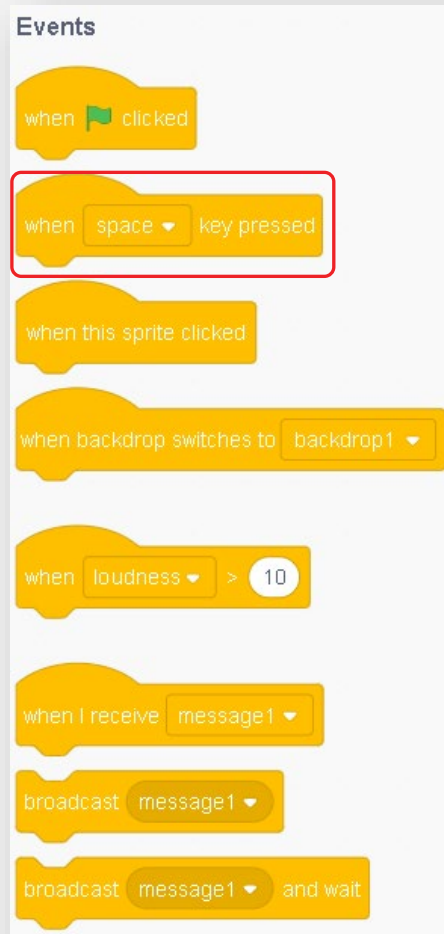


Drag a “when key pressed” block for the cat and switch it to “right arrow”.

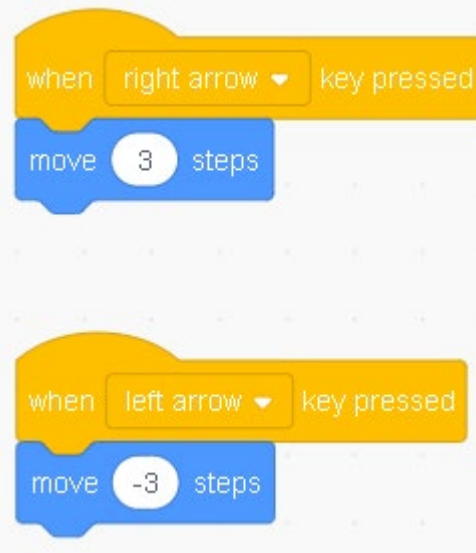
Drag a move _ steps after the block.



Event – When “button” key pressed



Script:



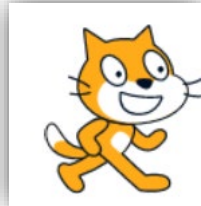
Drag another (“left arrow” key pressed) into the script and drag a move -3 steps after it.

These 2 scripts are to allow you to control your cat to move forward and backward with left and right arrow keys.



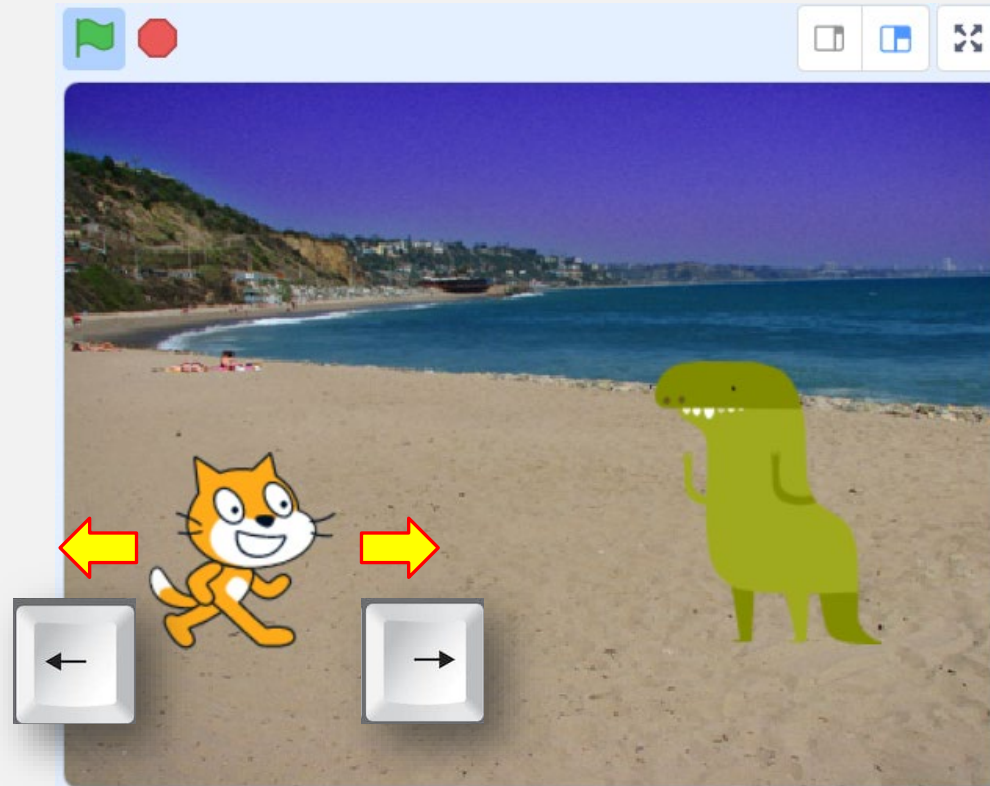
Event – When “button” key pressed

Script:



when right arrow key pressed
move 3 steps

when left arrow key pressed
move -3 steps



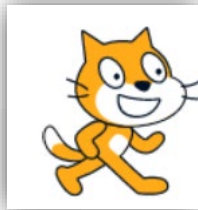
In this case, you do not even need to click the “go” / “flag” to move your cat.

You can straight press the left or right arrow button to move the cat forward or backward.



Setting Starting Position & Direction

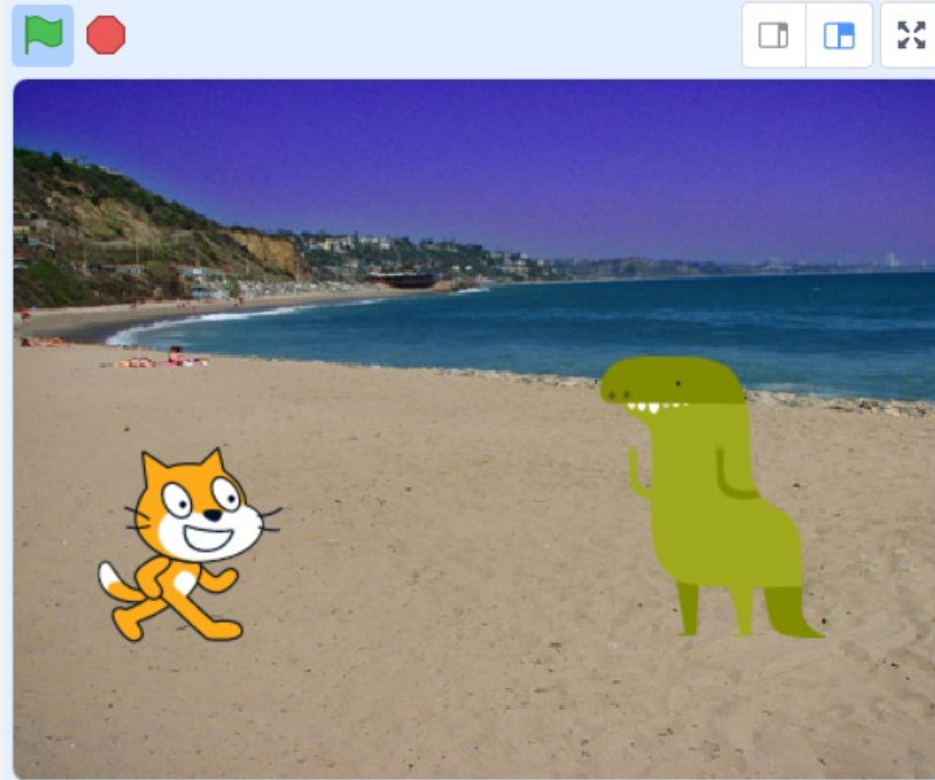
Script:



```
when green flag clicked
  go to x: -191 y: -59
  point in direction 90

when right arrow key pressed
  move 8 steps

when left arrow key pressed
  move -8 steps
```



I want the cat to start at (-191,-59) position and facing 90° when I click the “flag” / “go”.

So I will add in this script to position my cat at the start.

Moving everywhere on the stage

Script:



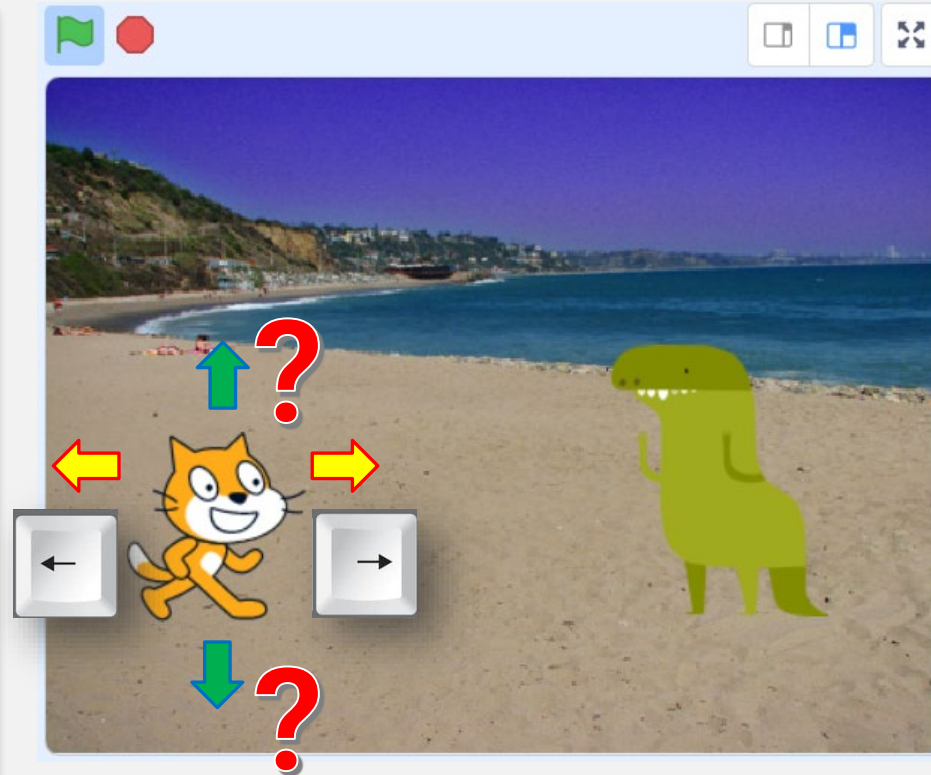
```

when right arrow key pressed
  move 3 steps

when left arrow key pressed
  move -3 steps

when up arrow key pressed
  ?

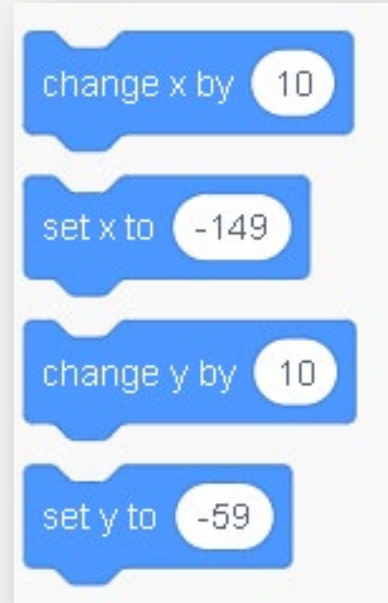
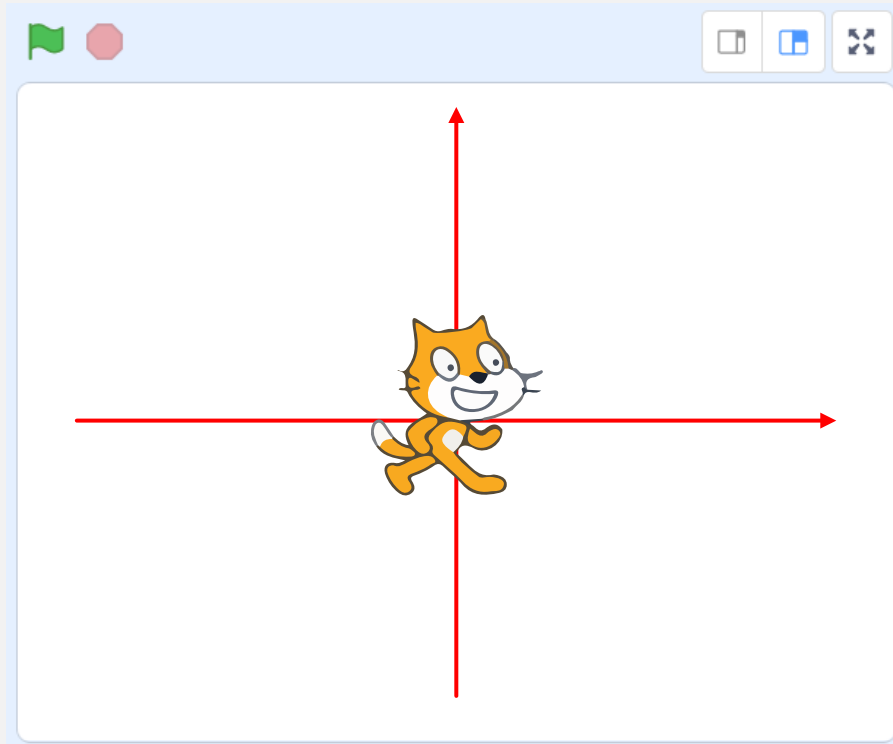
when down arrow key pressed
  ?
  
```



Now I can move my cat to left and right, but how should I program so that the cat can go up and down?

I added the “**when** key pressed” for up arrow and down arrow, but what’s next?

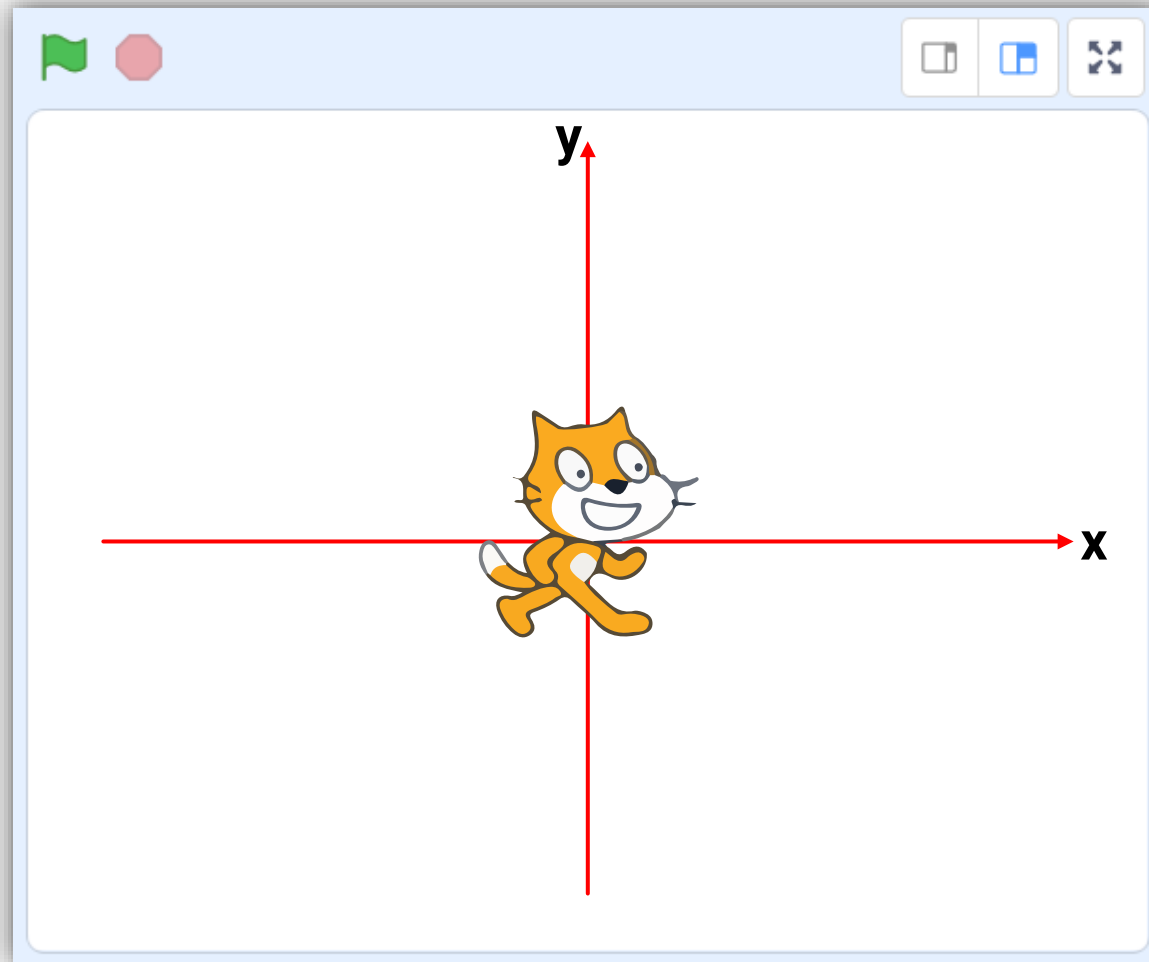
Introducing Changing Coordination



We actually can use “Change x by __” and “Change y by __” blocks to alter the position of the cat.



Review on the coordination



Coordination: (x , y)

Centre = (0 , 0)

Coordination basically refers to the position of the Sprite.

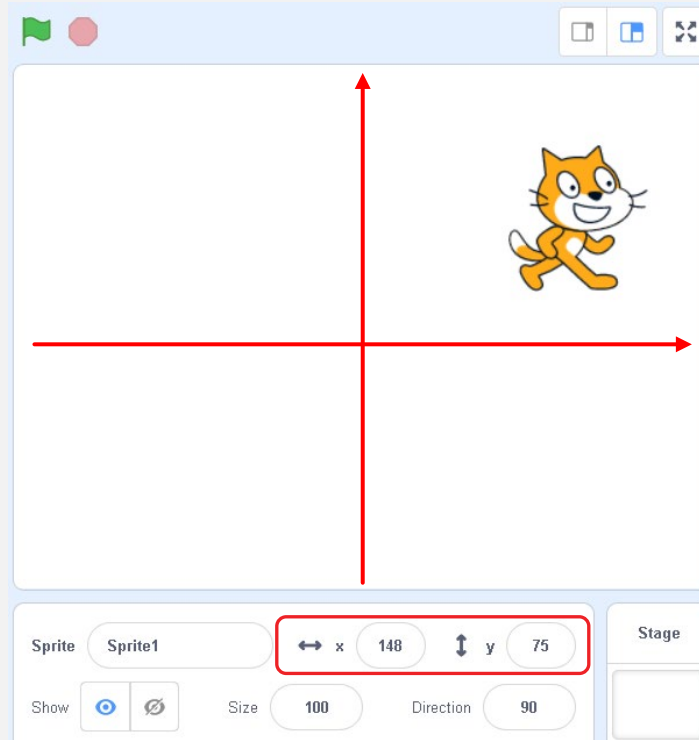
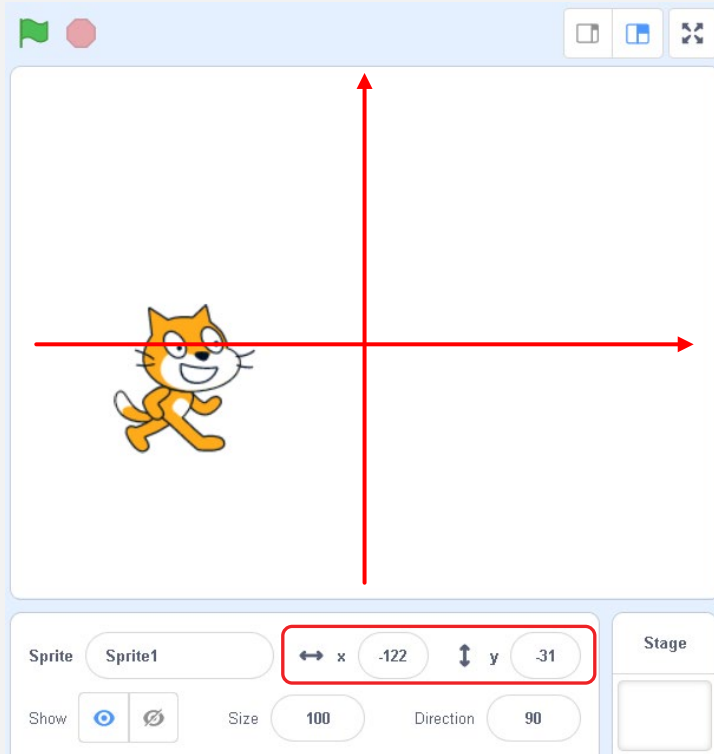
x coordinate >> left and right
y coordinate >> up and down

Change in coordination:

increase x >> move to right
decrease x >> move to left
increase y >> move upward
decrease y >> move downward



Scratch Programming Blocks - Move



When your object is dragged to different point at the stage, it will show different coordination

Changing y – up & down

Script:



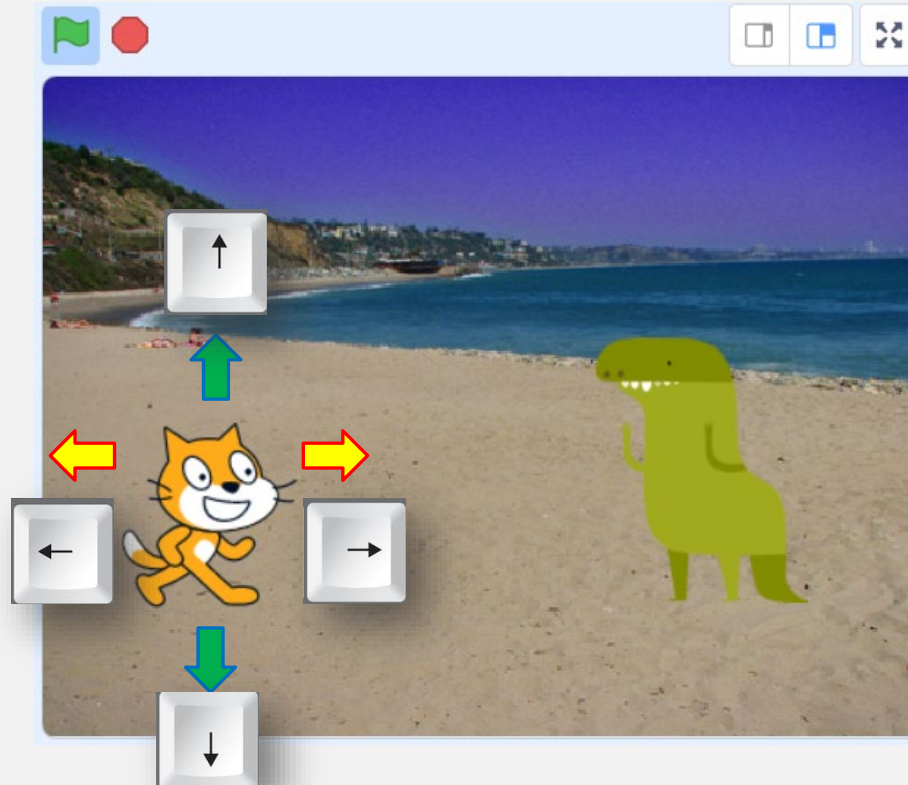
```

when right arrow key pressed
  move 3 steps

when left arrow key pressed
  move -3 steps

when up arrow key pressed
  change y by 3

when down arrow key pressed
  change y by -3
  
```



By changing the y coordination of the cat, the cat can move up and down.

If $\text{change } y > 0$ (or positive), it will move the object upward, else if $y < 0$ (or negative), it will move downward. If $\text{change } y = 0$, the object won't move.

Changing X by 3 vs Move 3 Steps

Script:



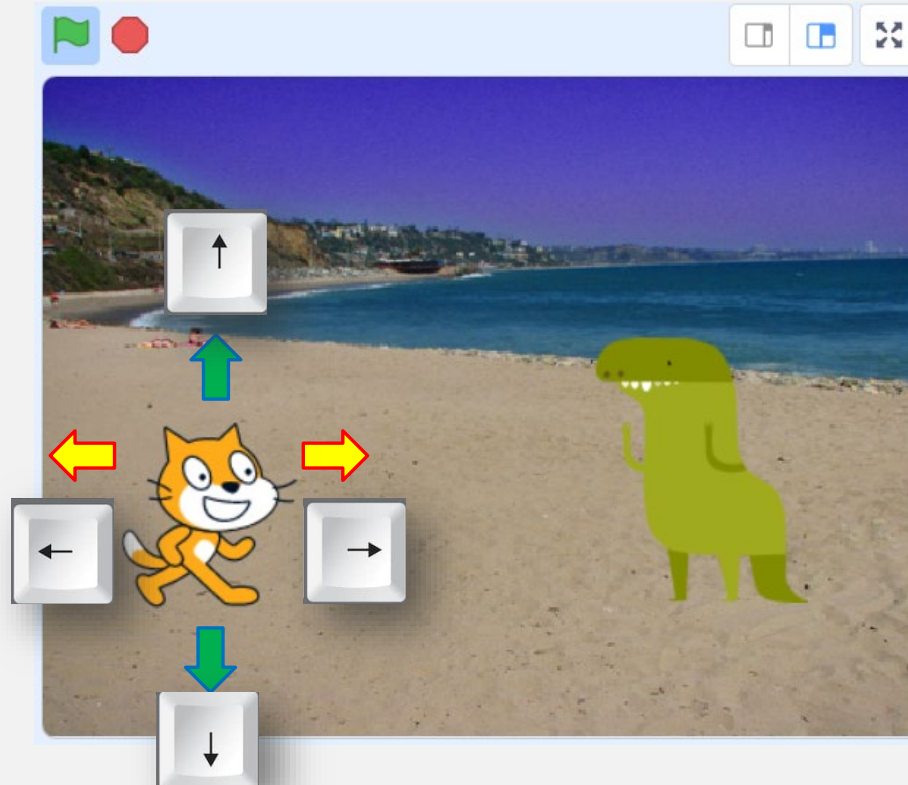
```

when right arrow key pressed
  change x by 3

when left arrow key pressed
  change x by -3

when up arrow key pressed
  change y by 3

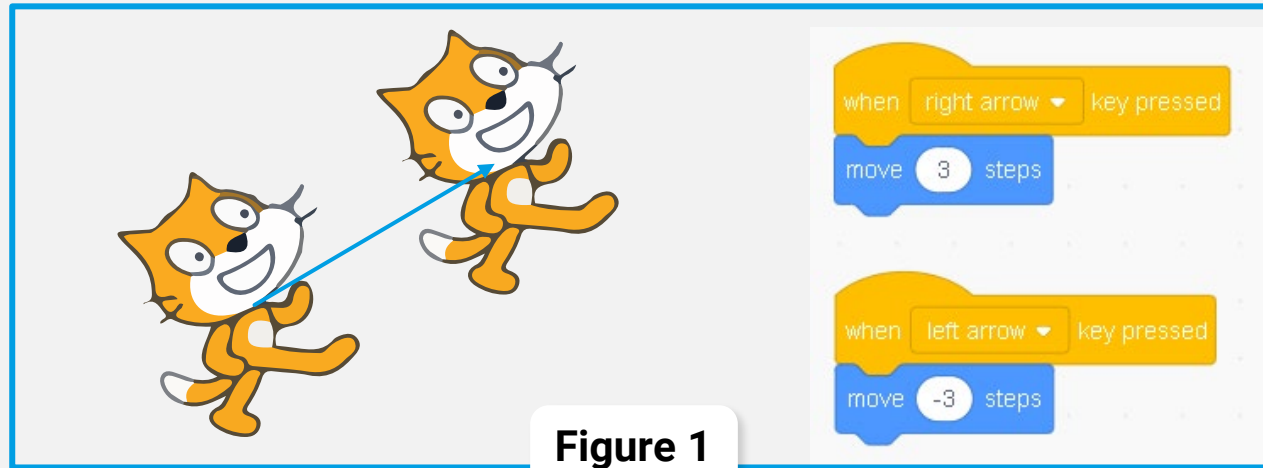
when down arrow key pressed
  change y by -3
  
```



The same to left and right, we can switch it to change x by 3 with move 3 steps.

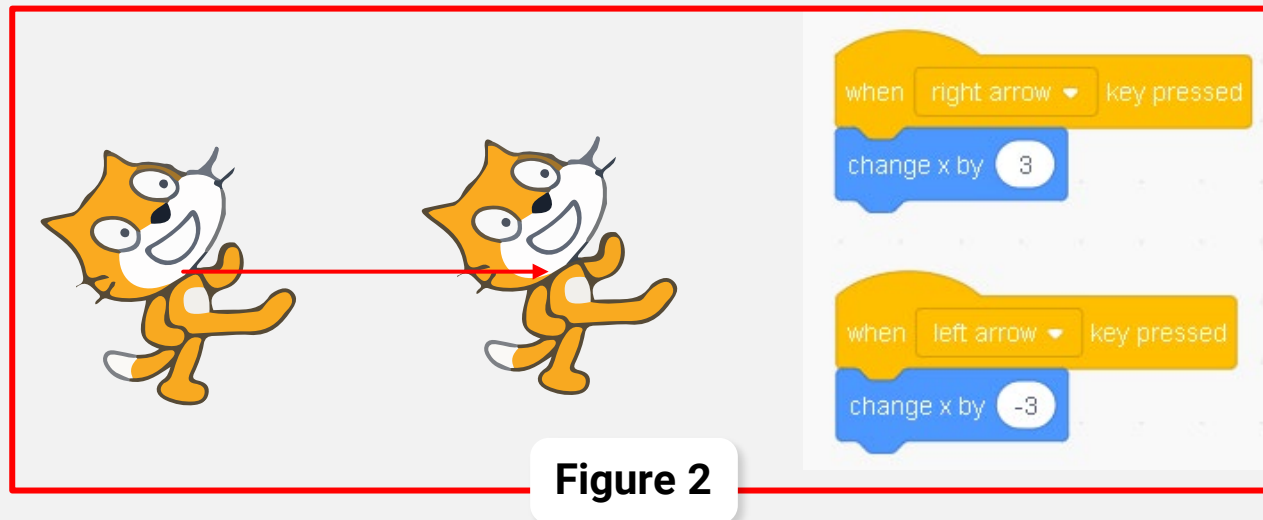
The difference is change x is to alter the position of the cat, where move 3 steps is to make the cat move forward on its direction.

Changing X by 3 vs Move 3 Steps



Therefore if your cat is tilt or turned, your move 3 steps will direct your cat to the pointing direction (figure 1).

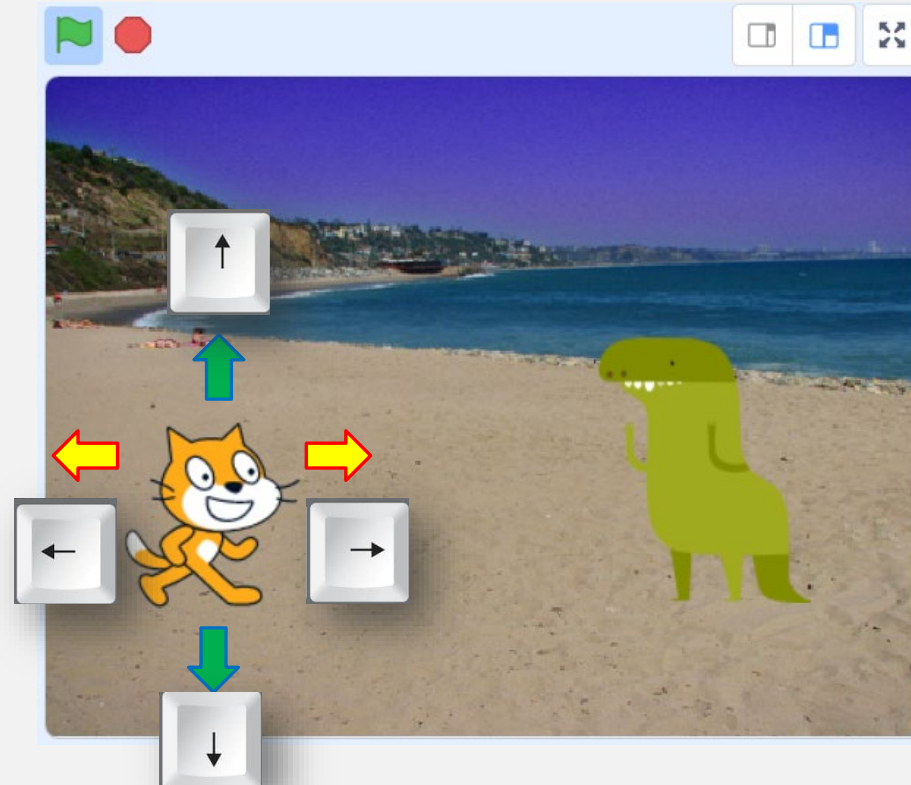
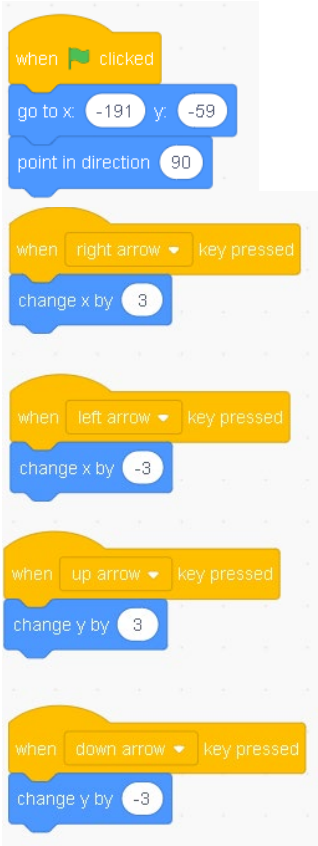
But if your script is written with change x by 3, your cat will still move forward horizontally (figure 2)





Cat - Scripts

Script:



Your cat has Starting position and direction + it has its movement programmed with keyboard arrows.

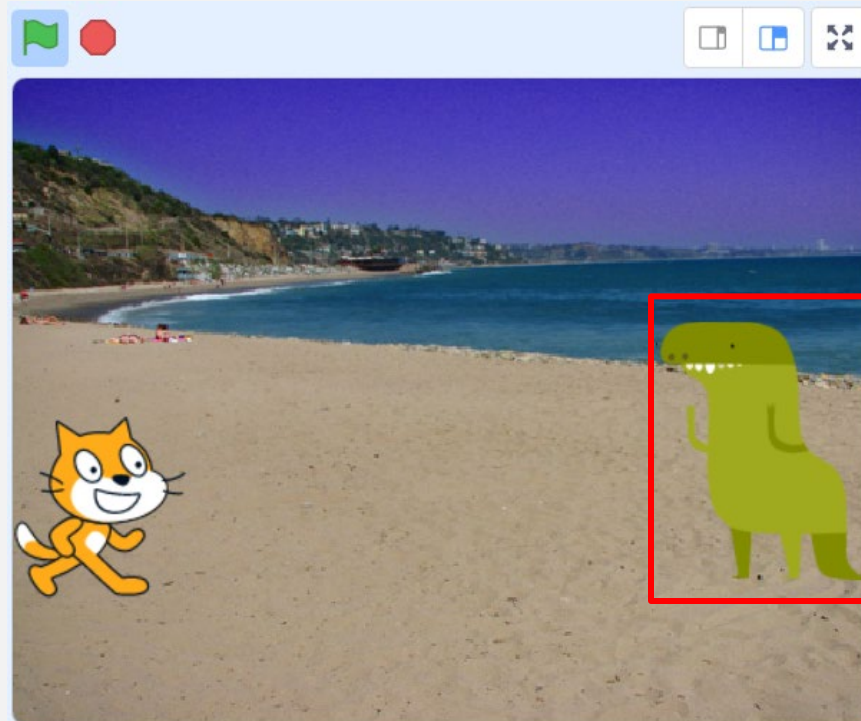
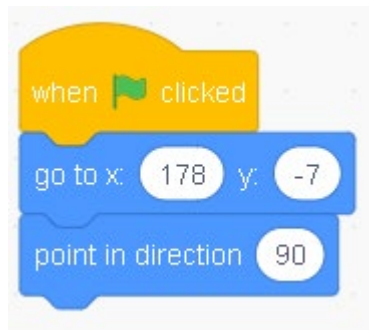
Your cat is under your control now.

Let's go program the dinosaur.



Program your Dinosaur

Script:

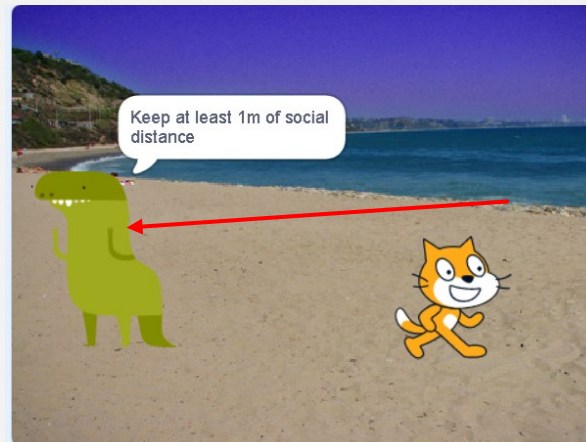
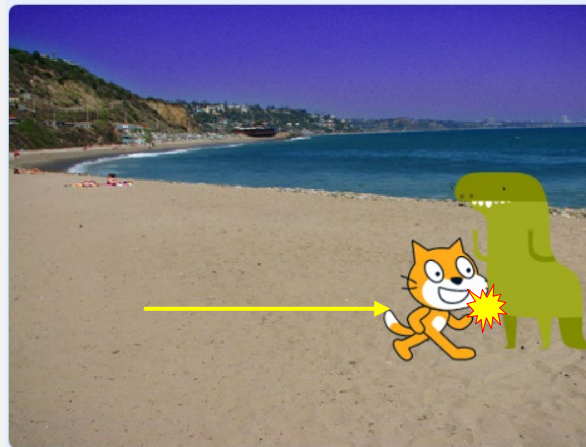
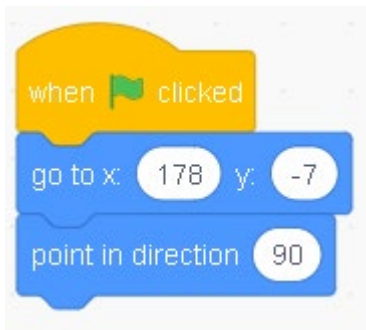


I want my Dinosaur to start at almost the edge of the right. And I had flipped the costumes to right so that it will face the cat.

I will set the Dinosaur to point at 90° at the start.

Program your Dinosaur

Script:

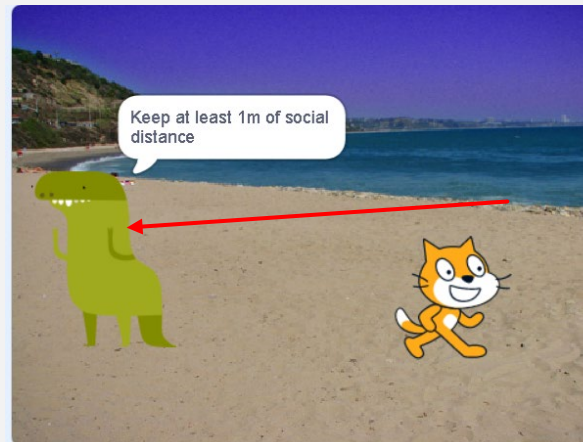
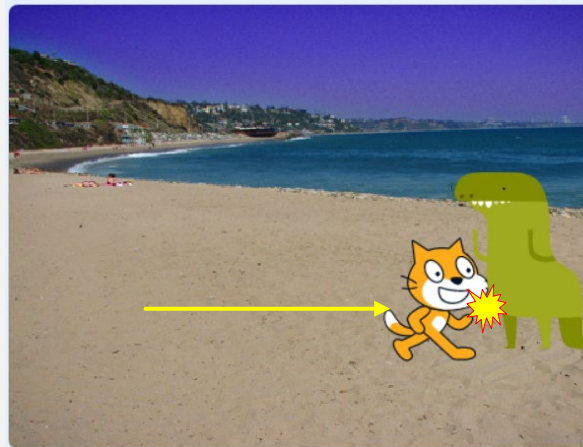
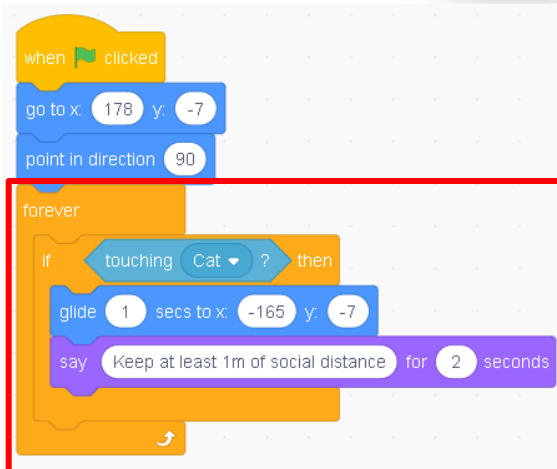


I want to make the Dinosaur to keep a social distance with the cat, so I want to program the Dinosaur to go the left when the cat touches him.

Then say "Keep at least 1m of social distance".

Forever if - loop

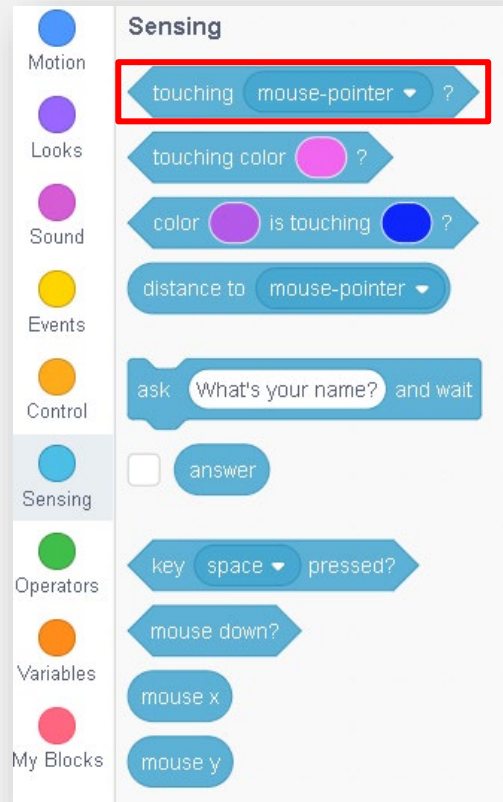
Script:



So here because the Dinosaur won't move until the cat touches him. In this case, I will need to put in a "if" statement with a forever loop.



Sensing – Touching other Sprite



Script:



If the dinosaur touching “Cat”, it will glide 1 second to (-165,-7), which is the position on the left (around cat starting position).

Followed by saying “Keep at least 1m of social distance” for 2 seconds.



Glide to position

Motion

move 10 steps

turn 15 degrees

turn 15 degrees

go to random position

go to x: 178 y: -7

glide 1 secs to random position

glide 1 secs to x: 178 y: -7

Script:



when green flag clicked

go to x: 178 y: -7

point in direction 90

forever

if touching Cat ? then

glide 1 secs to x: -165 y: -7

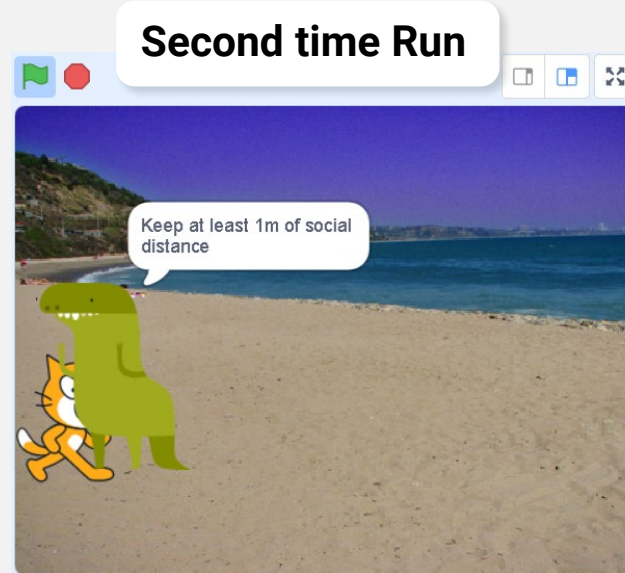
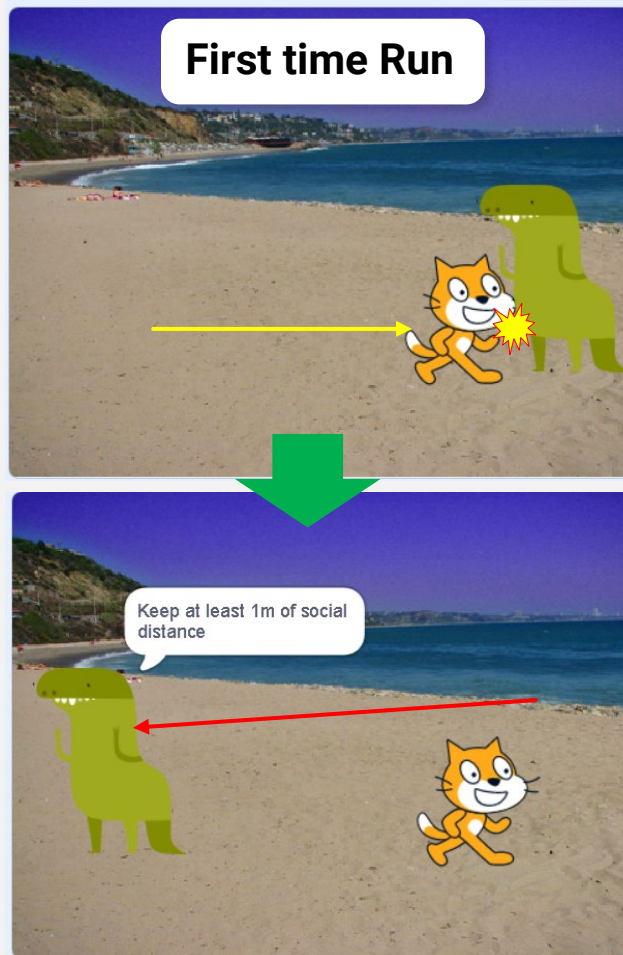
say Keep at least 1m of social distance for 2 seconds

The glide 1 secs to x:-165 y:-7 means that the Dinosaur will glide to (-165,-7) with 1 second of time.

If the position is too far from him, it will move faster if the time is not changed.



Click “Go” to run your story

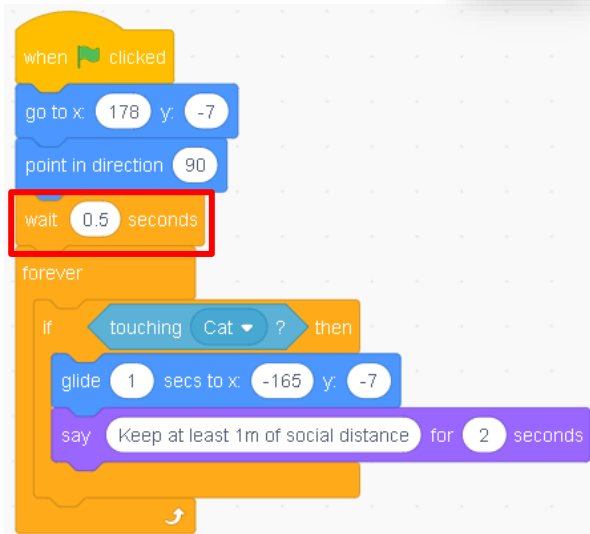


If you click “go” button for the first time, after you move your cat to touch the Dinosaur, the Dinosaur will go to the left. But if you click “stop” and re-run the story again, you will find that the Dinosaur straight rush to the cat without the cat touching it at the first.



Add buffering time

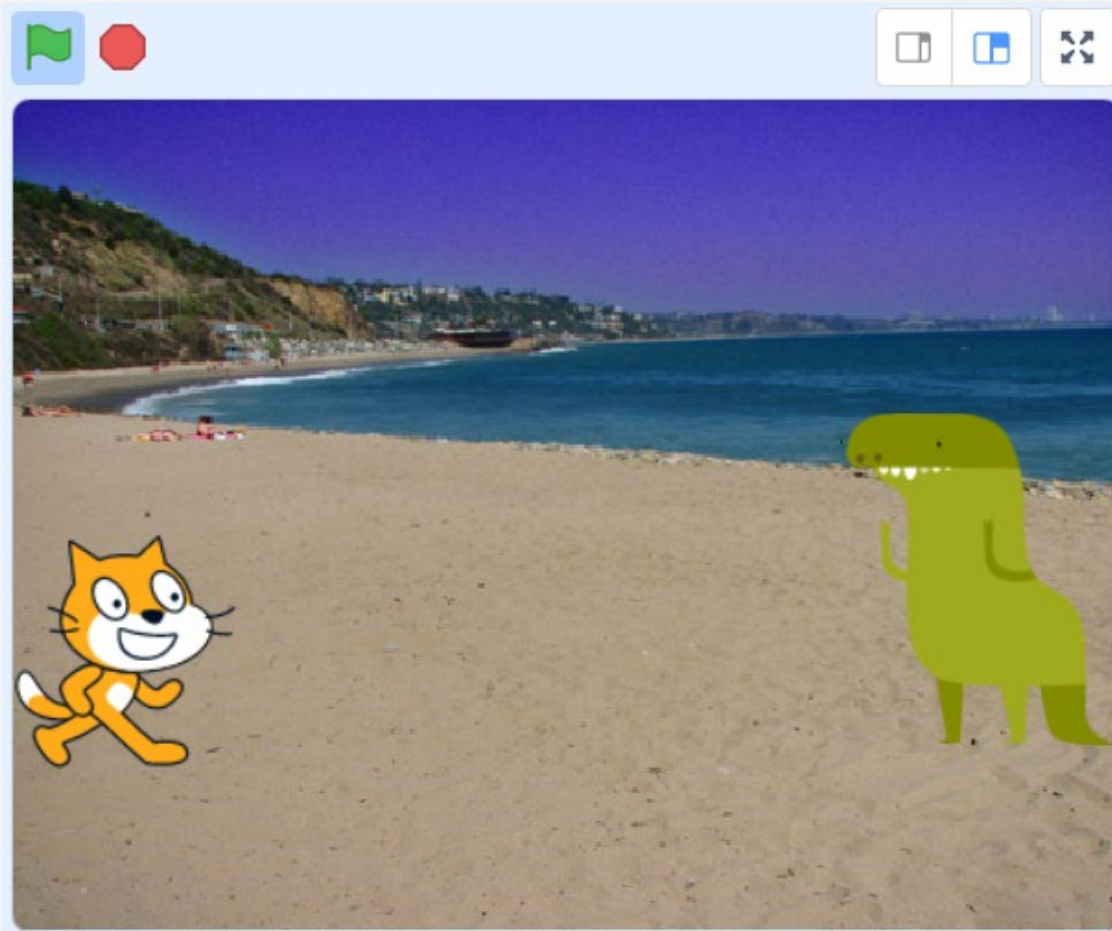
Script:



You would need to add a wait 0.5 seconds before going into the forever loop because when click start, the cat is touching the Dinosaur before the cat moves back to its starting position. So we allow 0.5 seconds for cat to reposition itself.



Run your Story again



Re-run the story and you will see the outcome as expected.



Chase the Dinosaur – Glide Randomly

Motion

- move 10 steps
- turn 15 degrees
- turn 15 degrees
- go to random position
- go to x: 178 y: -7
- glide 1 secs to random position**
- glide 1 secs to x: 178 y: -7

Script:



```
when green flag clicked
  go to x: 178 y: -7
  point in direction 90
  wait 0.5 seconds
  forever
    if touching Cat ? then
      glide 1 secs to random position
      say Keep at least 1m of social distance for 2 seconds
```

If you change the glide to position to random position, when your cat touches the Dinosaur, it will glide to other place. And you can make your cat to chase the Dinosaur.



ASSIGNMENT *for*

Topic 1.5



T1.5 – Mission 1

Make a cat & mouse game, you can use arrow button on your keyboard to control the cat.

Once your cat touches the mouse, the mouse will glide to random position.



T1.5 – Mission 2

Change the characters in the game to your favorite sprites.

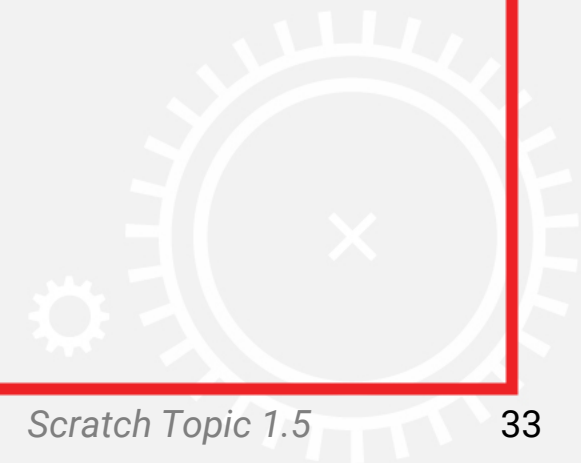
Make the Mouse (non-controlling sprite) to keep pointing to the Cat (main character).



T1.5 – Mission 3

Design your own game with interactive mode that you can control the main sprite.

Add in 2 – 3 non-controlling sprites (mouse) to response with the main sprites when touching it.





Summary

1. Use “When key pressed” block to trigger the actions following the when key pressed block.
2. Change x by and change y by is altering the position of the sprite, where move steps is to make the sprite to move in the pointing direction.
3. Forever-if loop mainly being used for checking the conditions (touching, sensing, pressing) repeatedly. Without forever loop, the if condition only will be executed for once.
4. Add a buffer time for the sensing at start to ensure setup is done before sensing function.



You can direct message your teacher and ask your question through [Slack Robotene Community](#) or arrange a [One-to-One Consultation](#) with your teacher.



Any Questions?



Thank you :)