Scratch Programming

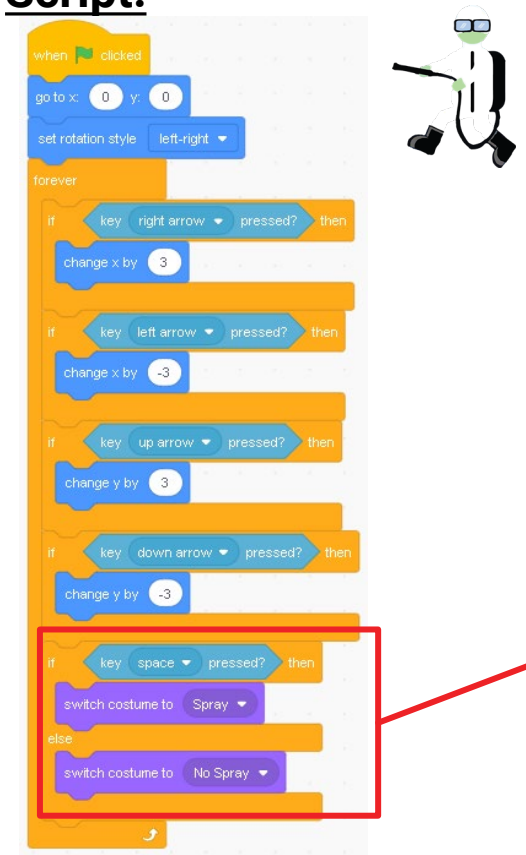
Topic 1.9

Pick Random Number

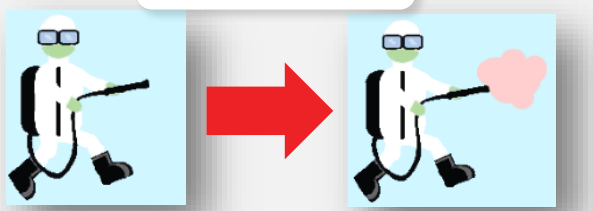
Presented by Advaspire Team

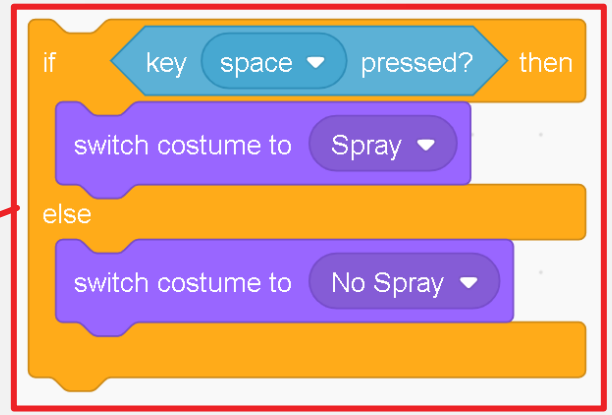
Review Last 2 Topics – Disinfectant Game

Script:



<Spacebar> pressed





Game Rules #3:

When pressing <space bar> your disinfectant cleaner will spray the gas but it will remain back to the costume without spraying if <space bar> is not pressed.

I put a if-else statement in the loop function.
If <space> pressed, then it will switch to "Spray" costume. Else, it will switch back to "No Spray" costume if <space> is not pressed.

Review Last 2 Topics – Disinfectant Game

Game Rules:

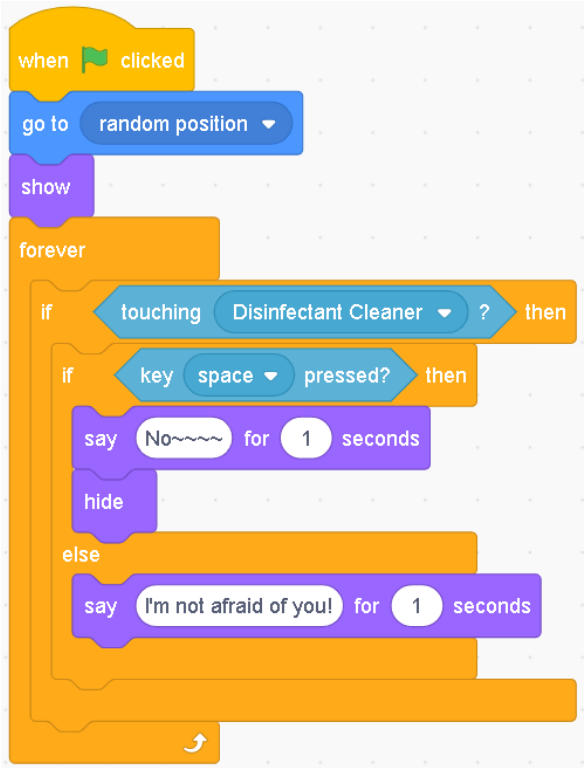
1. **You are able to control your cleaner with up-down-left-right arrow keys (rotation style = left-right)**
2. **Your cleaner starts at the centre**
3. **When pressing <space bar> your disinfectant cleaner will spray the gas but it will remain back to the costume without spraying if <space bar> is not pressed**
4. **If the cleaner hits the edge, bounce back**
5. **When your cleaner move to the right, it will face right, otherwise it will face to the left**
6. There will be 4 viruses on the stage on the start and all of them spawn randomly
7. If disinfectant hit the virus with spraying costume, the virus will shout “No~~” then disappear.
8. The virus will say “I’m not afraid of you!” and remain there.

Program Disinfectant Cleaner

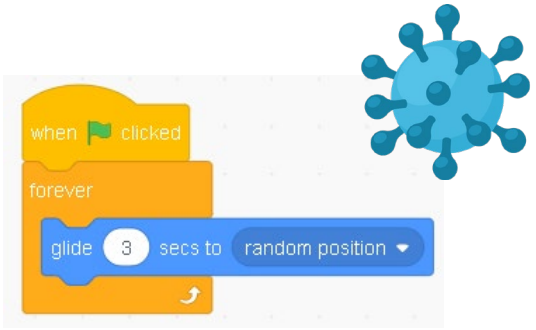
Program your Virus

Review Last 2 Topics – Virus Script

Script:



Check if virus touches disinfectant cleaner



Random movement

My solution is to add a parallel program that make it glide 3 secs to a random position, and make it loop forever.

So as long as the virus is still on the stage, it will keep gliding to random position with 3 seconds.

Remember to add this program to all other viruses.

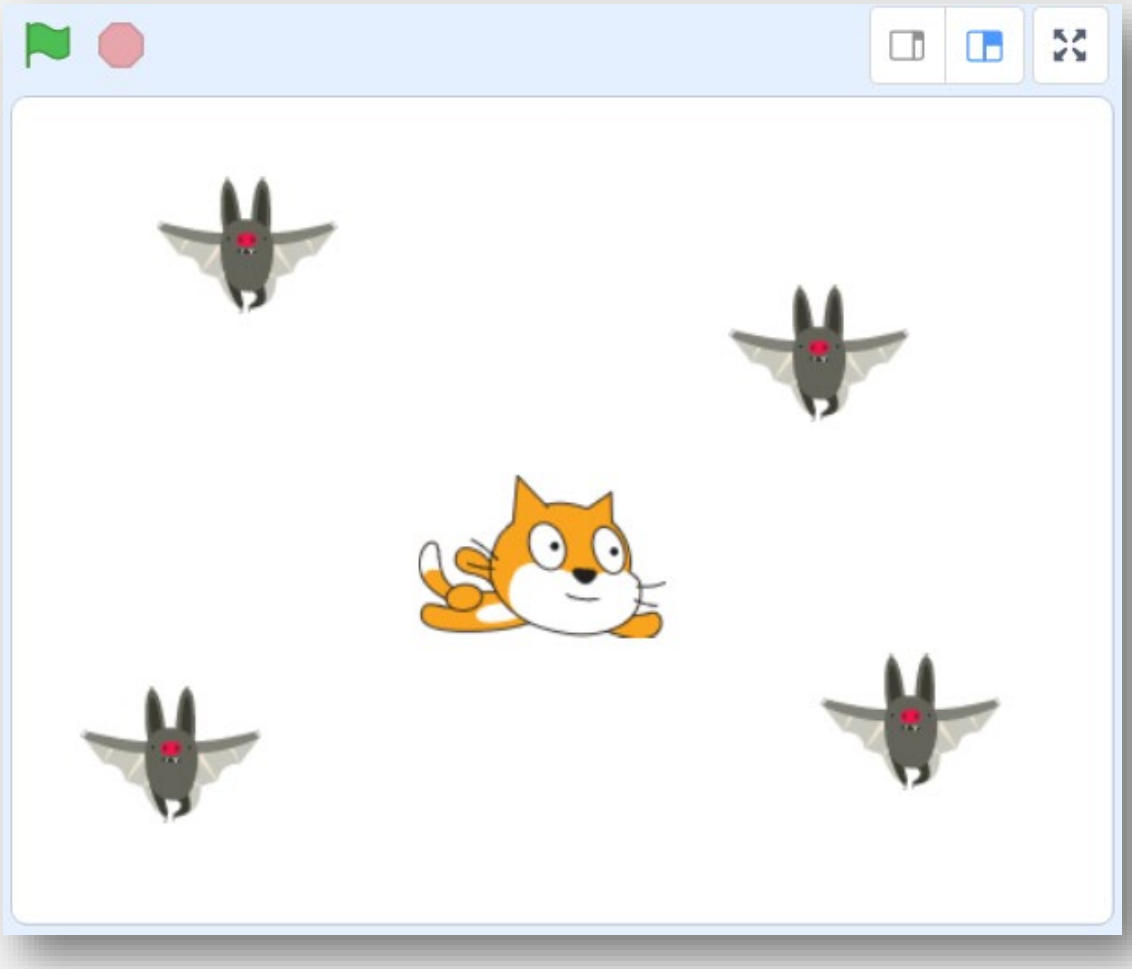
Today's Topic

1. Cat vs Bat Game
2. Pick Random Block
3. Random movement with constant speed

Learning Outcome

1. Able to use pick random block to perform randomize motion
2. Able to add animation to non-playing-character

Mission T1.8 – Cat Vs Bat



Create a game with title “Cat vs Bat”.

In this game your cat can be controlled by you with arrow buttons (up-down-left-right) and <space> key to change to second costume.

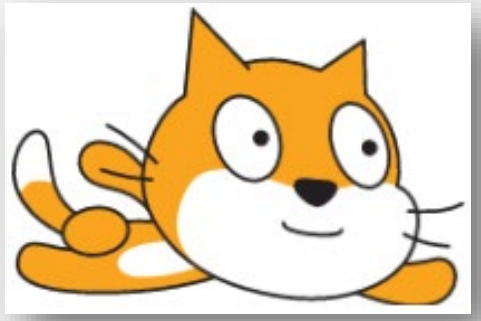
The Bat will move randomly and the cat need to punch and knock out all bats.

Mission T1.8 – Cat Vs Bat

Game Rules:

1. You are able to control your cat with up-down-left-right arrow keys
2. Your cat will start at the centre
3. <space> pressed -> Cat Flying (1st costume)
4. <space> not pressed -> Cat Punching (2nd costume)
5. When cat flying to right side -> face right
6. If cat is flying to left -> face left.
7. 6 bats (size = 40%) in the game, spawn randomly and will move randomly
8. When bat gets hit by “Cat Flying”, nothing happen
9. If bat gets hit by “Cat Punching”, disappear from the screen

1. Add your Sprites first

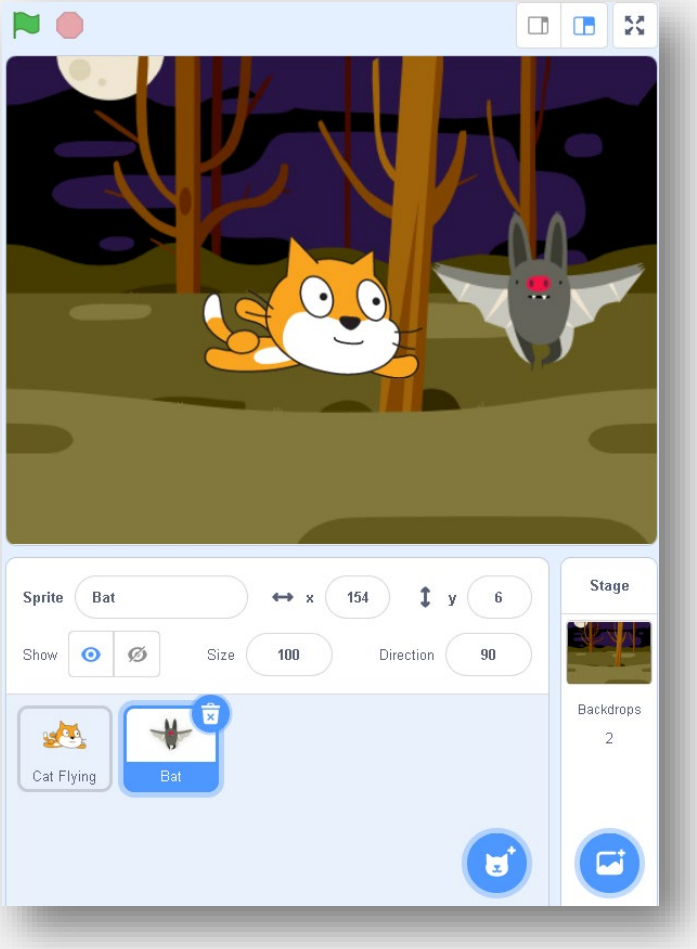


Cat flying

Bat

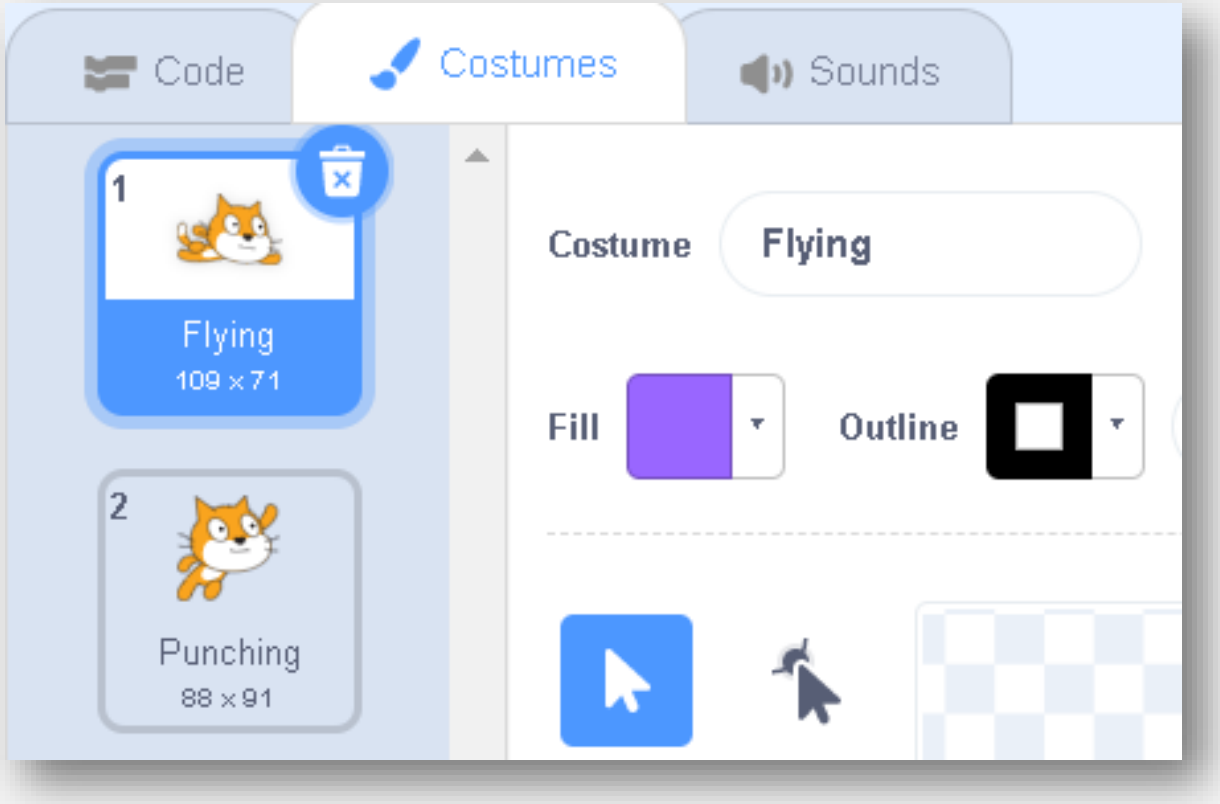
Backdrop - Woods

1. Add your Sprites first



Add all sprites and backdrop to your Stage.

2. Rename Cat Costumes



Rename "cat flying-a" to "Flying" and "cat flying-b" to "Punching".

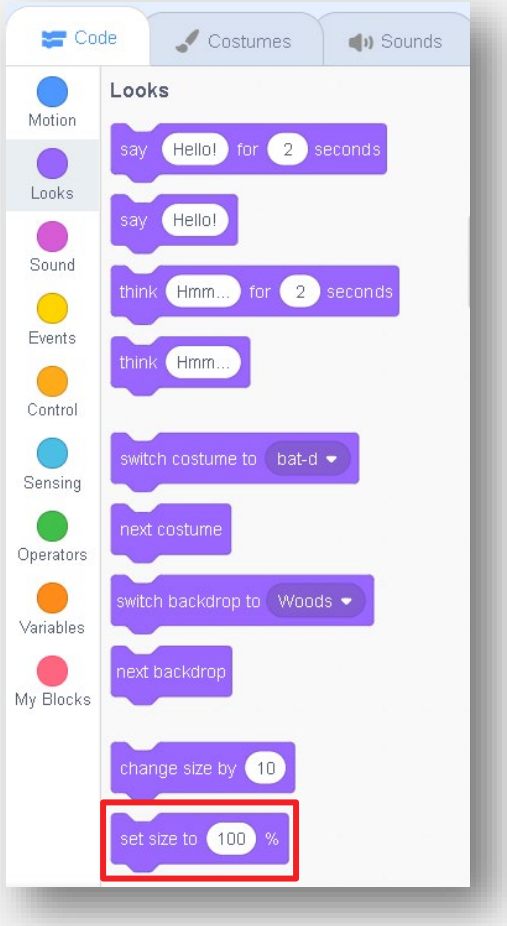
3. Program your Cat

Script:

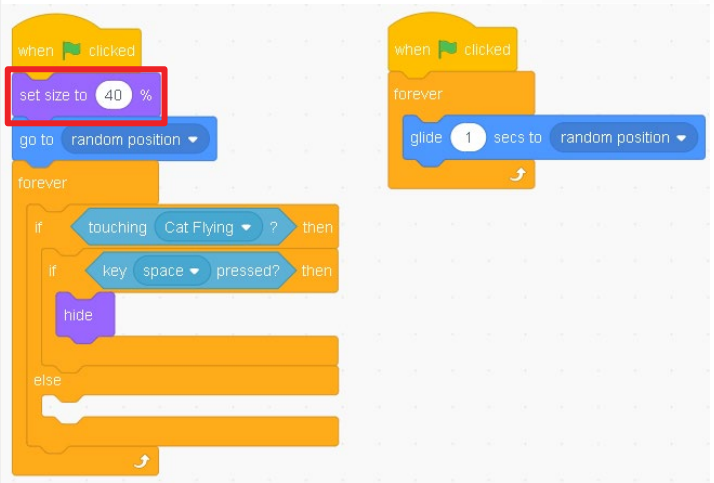
Follow the previous lesson programming method, you will settle 6 game rules:

1. **You are able to control your cat with up-down-left-right arrow keys**
2. **Your cat will start at the centre**
3. **<space> pressed -> Cat Flying (1st costume)**
4. **<space> not pressed -> Cat Punching (2nd costume)**
5. **When cat flying to right side -> face right**
6. **If cat is flying to left -> face left.**

3. Program your Bat



Script:



We add a block to "Set Bat size = 40%"

Then the following blocks will be similar to how you code the covid-19 game.

Move Randomly (Unpredictable movement)

Game Rules:

1. You are able to control your cat with up-down-left-right arrow keys
2. Your cat will start at the centre
3. <space> pressed -> Cat Flying (1st costume)
4. <space> not pressed -> Cat Punching (2nd costume)
5. When cat flying to right side -> face right
6. If cat is flying to left -> face left.
7. 6 bats (size = 40%) in the game, spawn randomly and will move randomly
8. When bat gets hit by “Cat Flying”, nothing happen
9. If bat gets hit by “Cat Punching”, disappear from the screen

Instead of using “glide 1 secs to random position”, we will make a more frequent movement for the bat.

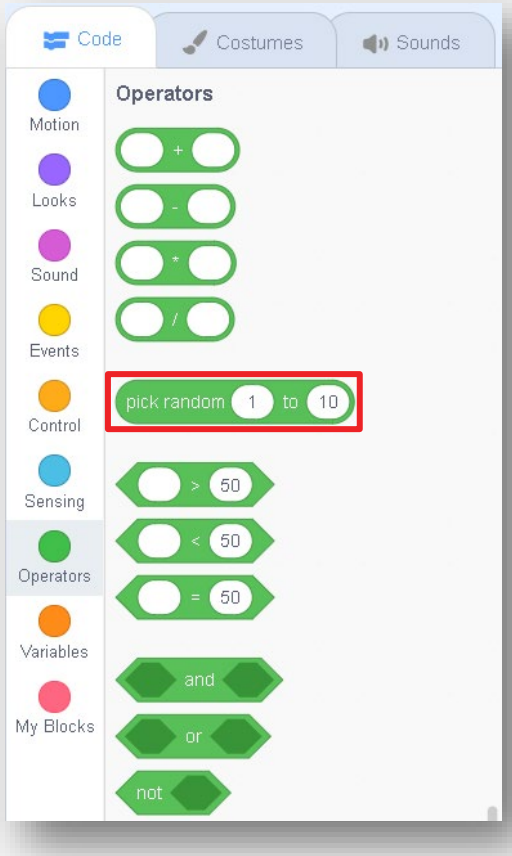
3. Program your Bat (Set Rotation Style)

Script:

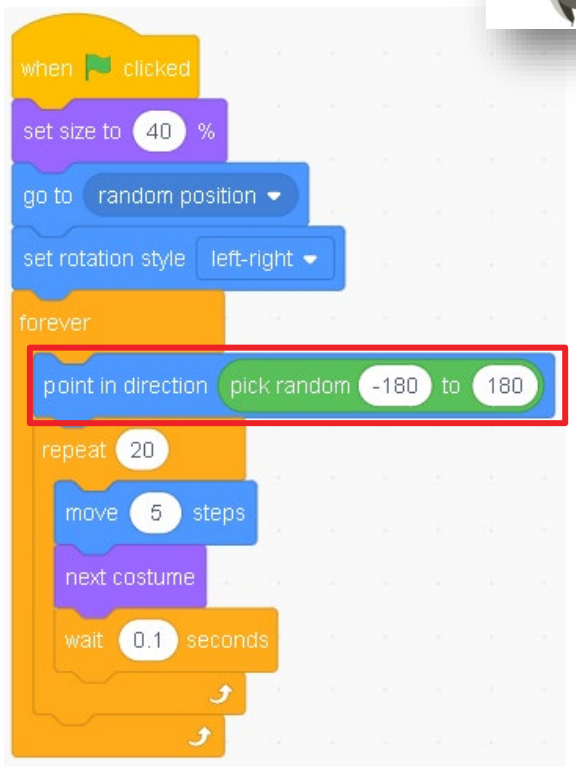
In order to make bat do more frequent unpredictable movement, we will first "set rotation style [left-right]" for bat.

This is to make sure bat won't rotate around with different pointing direction

3. Program your Bat (Point randomly)



Script:



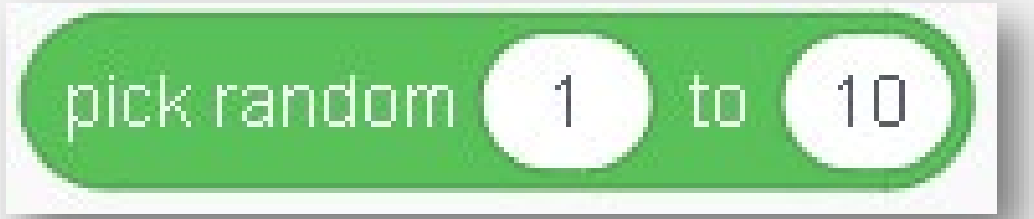
Then we will keep switching Bat's direction when moving around.

So you need to drag a "point in direction" block first.

Then we introduce a new block from the operators.

There is one block call "pick random 1 to 10". And you will notice the shape of this block is different than other blocks, it is in ellipse shape.

Pick Random ( ) to ( ) - explained



Pick random from 1 to 10 means to pick any number within these range. It can be “6”, it can be “9”, it can be “2” or any number in this range. These 10 numbers hold equal possibility to be picked.

1 2 3 4 5 6 7 8 9 10

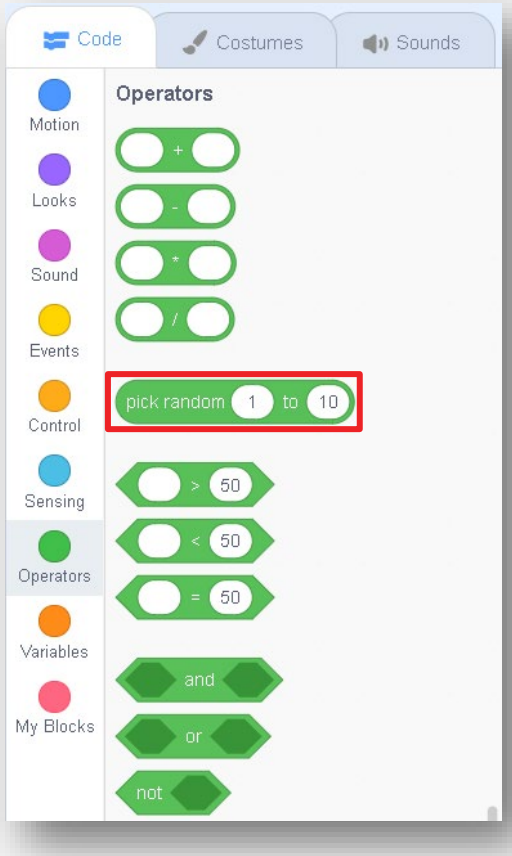
Pick Random ( ) to ( ) - explained

If you put from “-10” to “10”, then the range expands, and there will be a possibility to pick a number of from “-10” to “0” in this case.

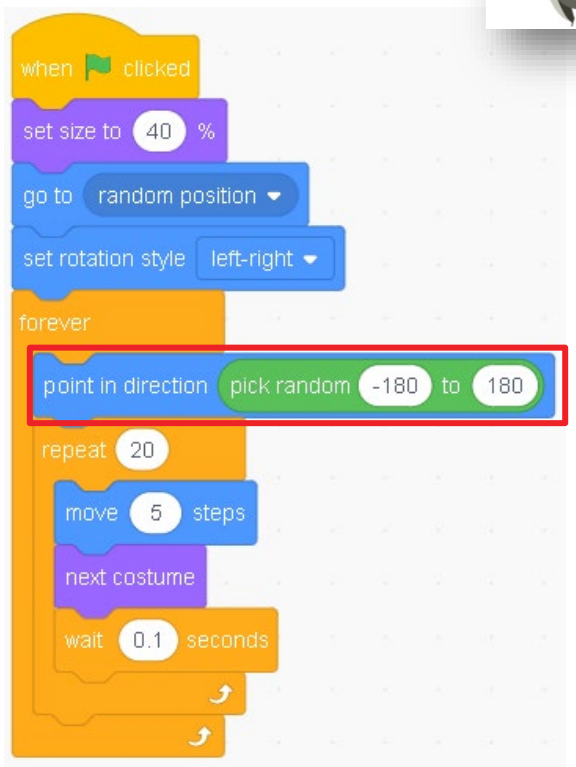
-10 -9 -8 -7 -6 -5 -4 -3 -2 -1 0

1 2 3 4 5 6 7 8 9 10

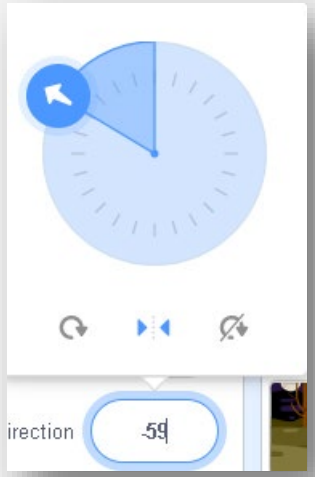
3. Program your Bat (Pick Random)



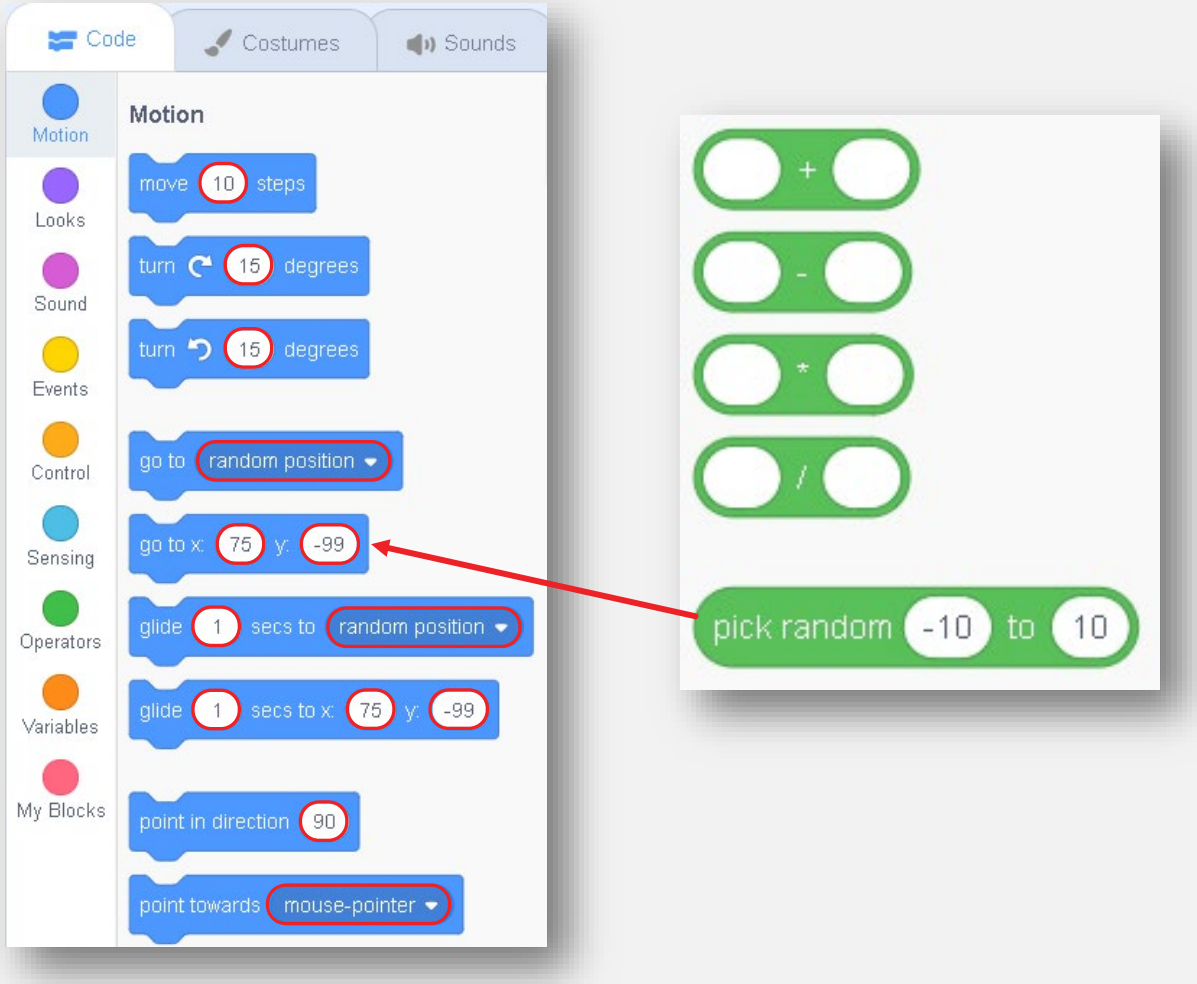
Script:



In this case,
I put pick random "-180 to 180" because I want it to turn randomly from every direction.



Variable – Number / Text

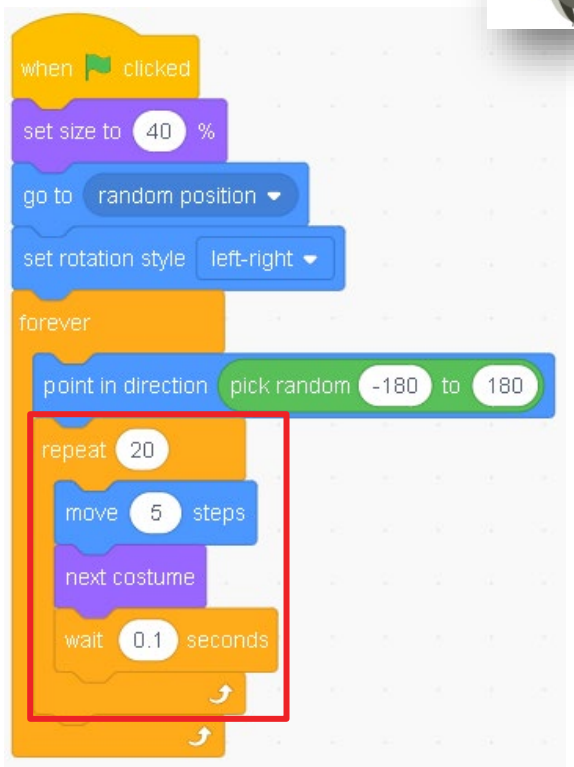


The ellipse block is served as the block that stored the value (number or text) and can be changed over time.

So for those motion block, the ellipse space like move "__" steps, we can put in a constant number like "10" or even put variable or random number to the move "__" steps to make it unpredictable.

3. Program your Bat (Random Movement)

Script:

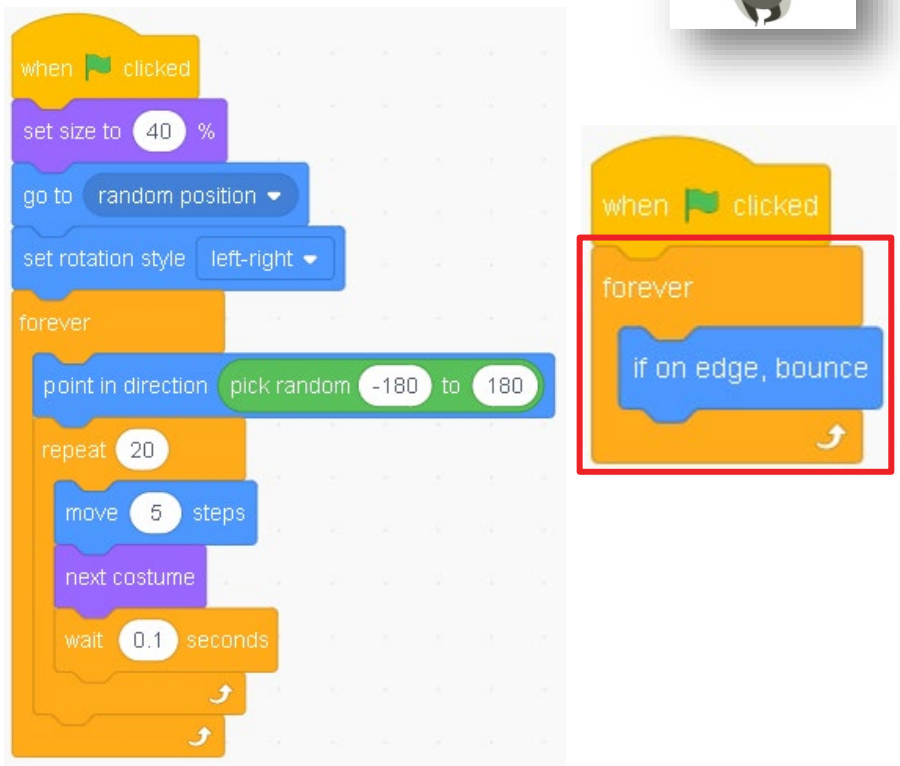


After pick 1 direction to point to, then the bat will move forward (follow the pointing direction) for 20 times with 5 steps each, while changing to next costume also.

The main difference between move randomly and glide 1 sec to random position is the speed of move randomly is constant, while the speed of glide to position will vary.

3. Program your Bat (Bounce on edge)

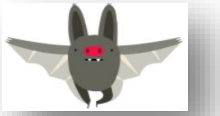
Script:

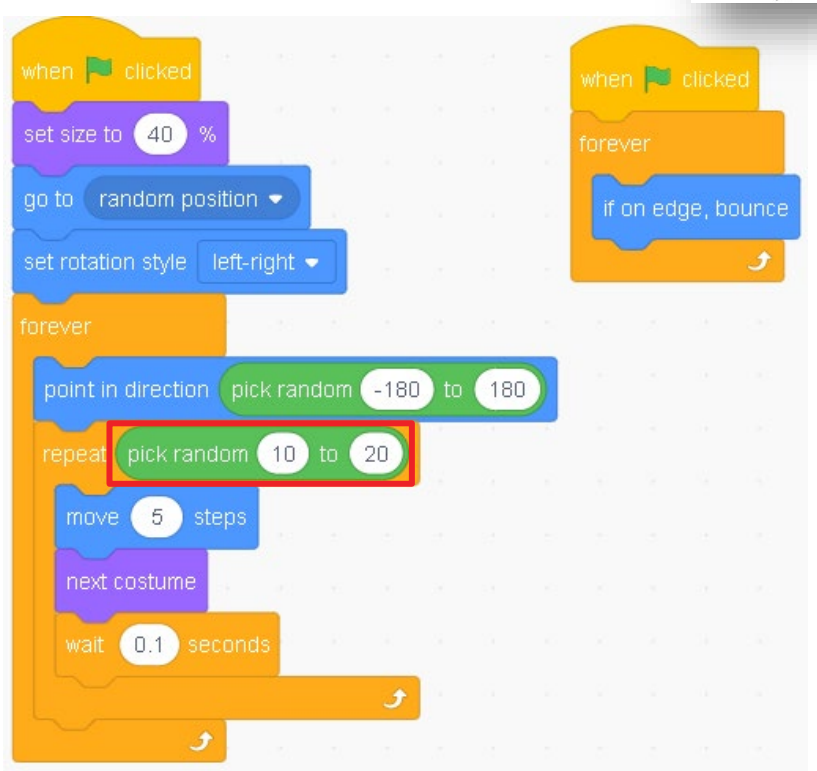


I add parallel program which is to make the bat to bounce when hit the edge.

3. Program your Bat (Bounce on edge)

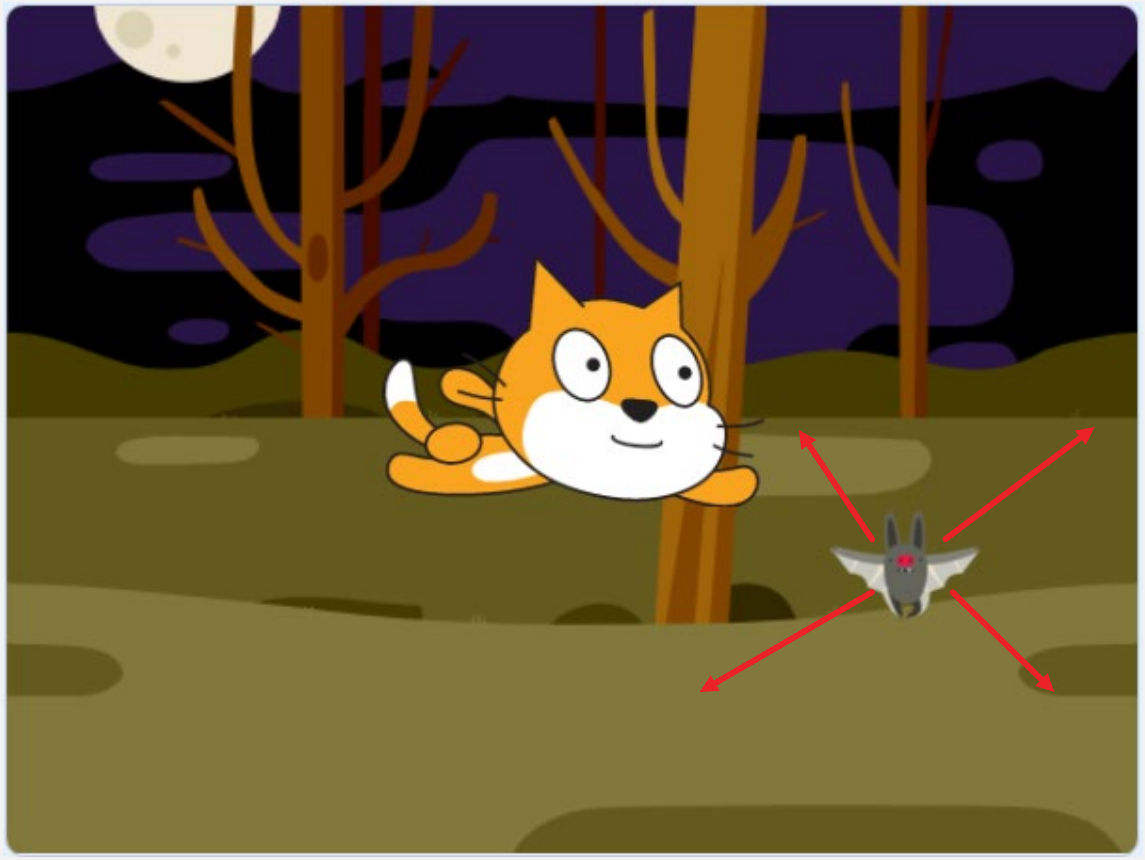
Script:





If you want a more unpredictable movement, you can also add pick random from 10 to 20 in the repeat block.

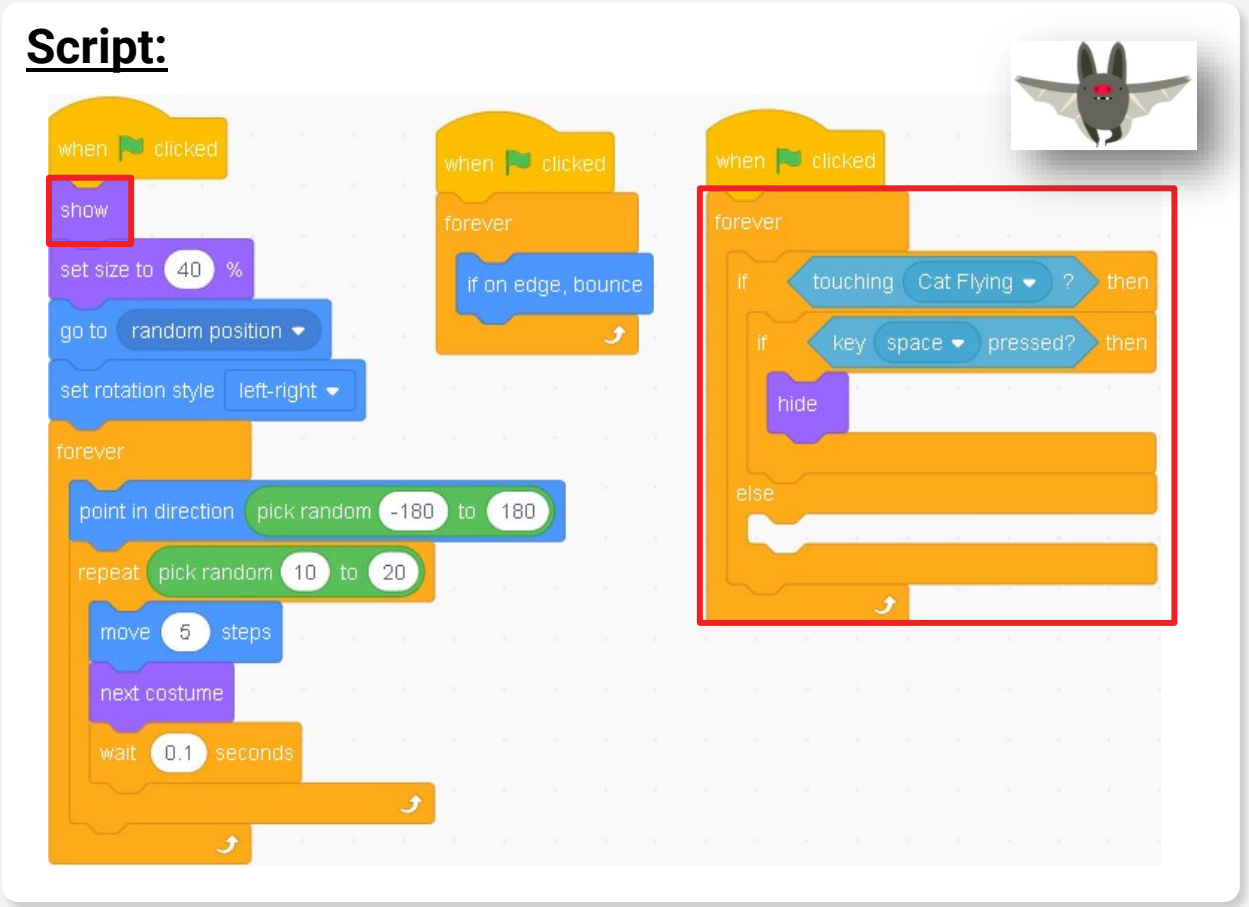
3. Program your Bat (Bounce on edge)



The bat will move randomly with constant speed now.

3. Program your Bat (Get hit by Cat)

Script:

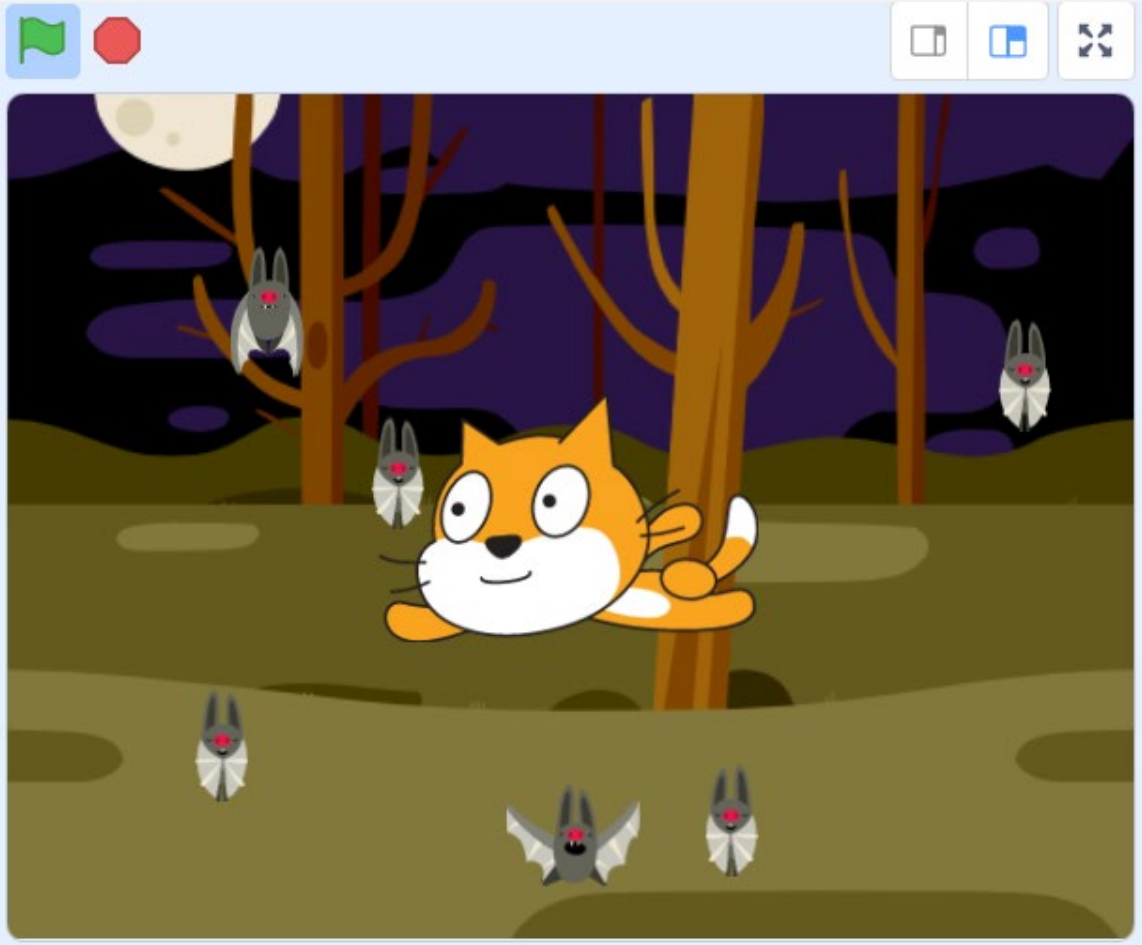


And you need a script to make the bat to disappear from the stage when get hit by "Cat Punching".

Continue on next lesson…

ASSIGNMENT *for*

Topic 1.9



T1.9 – Mission

Complete your Cat vs mouse game with remaining rules:

1. 6 bats (size = 40%) in the game, spawn randomly and will move randomly
2. When bat gets hit by “Cat Flying”, nothing happen
3. If bat gets hit by “Cat Punching”, disappear from the screen

Summary

1. Pick Random from a value to another value means taking a random number from the first value to second value.

2. The placement of “If on edge, bounce” block will affect when your character bounce back when hitting edge. By using parallel scripting method, we can make the bat directly bounce back whenever it touches the edge without any delay.

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 :)