



Scratch Programming

Lesson 7

Smooth Motion Control II

Presented by Advaspire Team

Script:

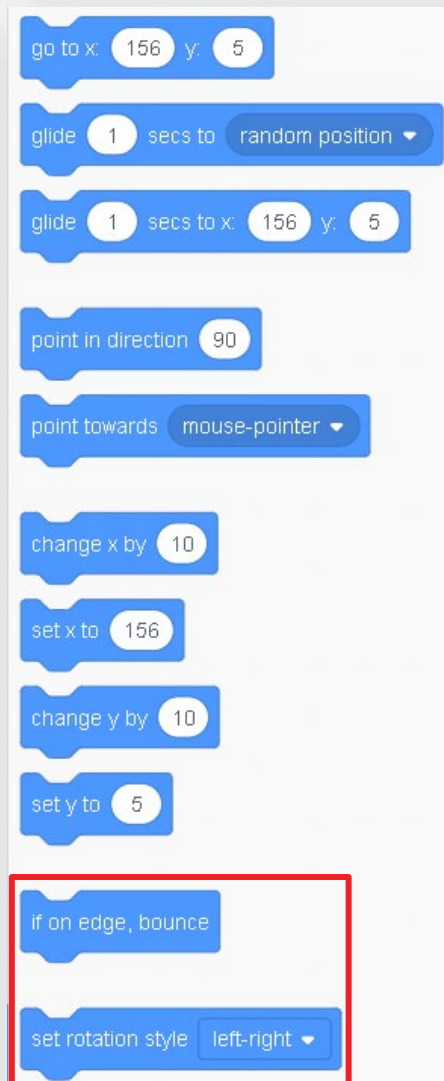


```

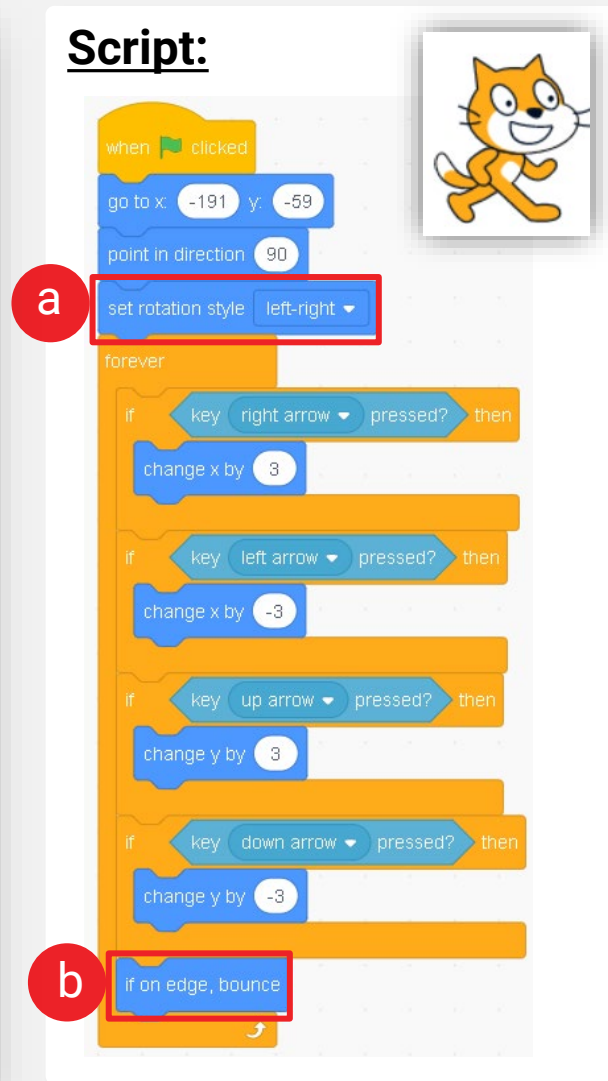
when green flag clicked
  go to x: -191 y: -59
  point in direction 90
  set rotation style left-right
  forever loop
    if key right arrow pressed? then
      change x by 3
    if key left arrow pressed? then
      change x by -3
    if key up arrow pressed? then
      change y by 3
    if key down arrow pressed? then
      change y by -3
    if on edge, bounce
  
```

Review - Smooth Control (Forever-if Loop)





Script:



Set Rotation Style

a

I will set the rotation style to left-right for the Cat.

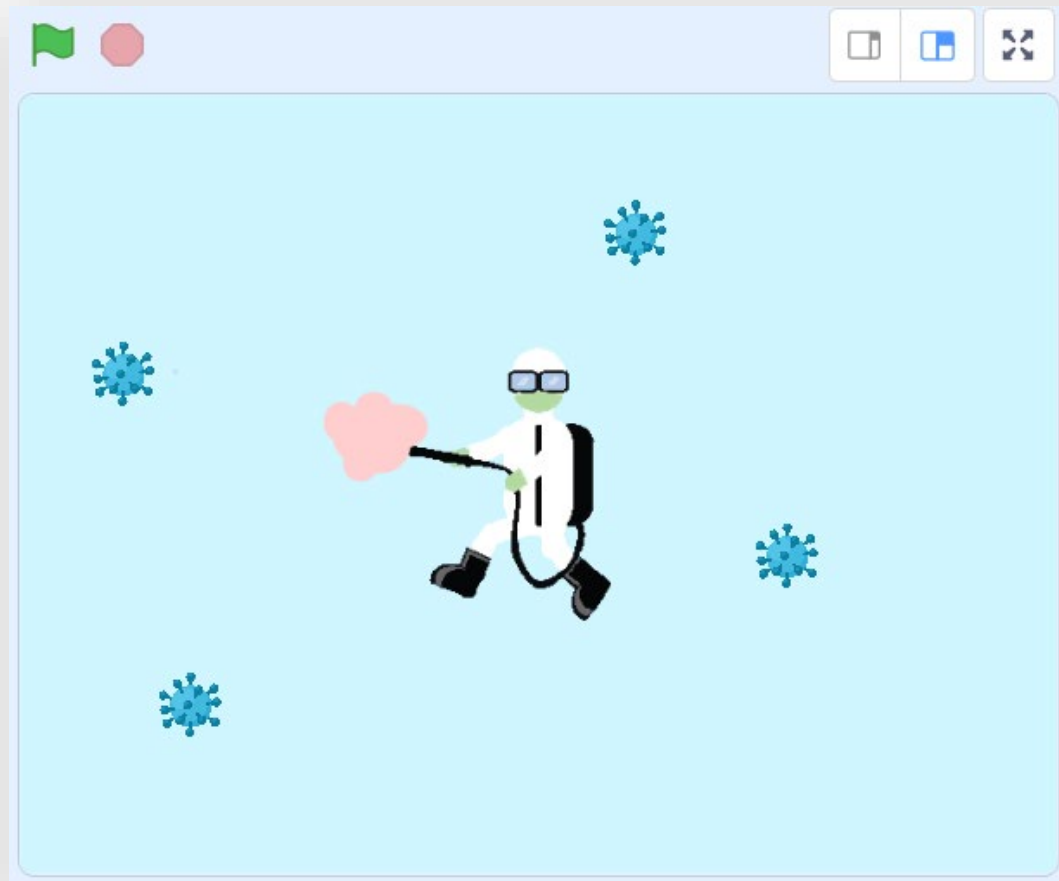
So no matter how the cat turn its pointing direction, the appearance of the cat is only showing left and right

b

I set a “if on edge, bounce” block into the forever loop.
This is to make the cat bounce back if it hit the edge of the stage.
**It's in the forever loop but outside of those if-loop*



Disinfectant Game – Coding Part



Make a Covid-19 game.

You are required to use the sprites (disinfectant cleaner & virus) in the link that I shared to you through Slack Group.



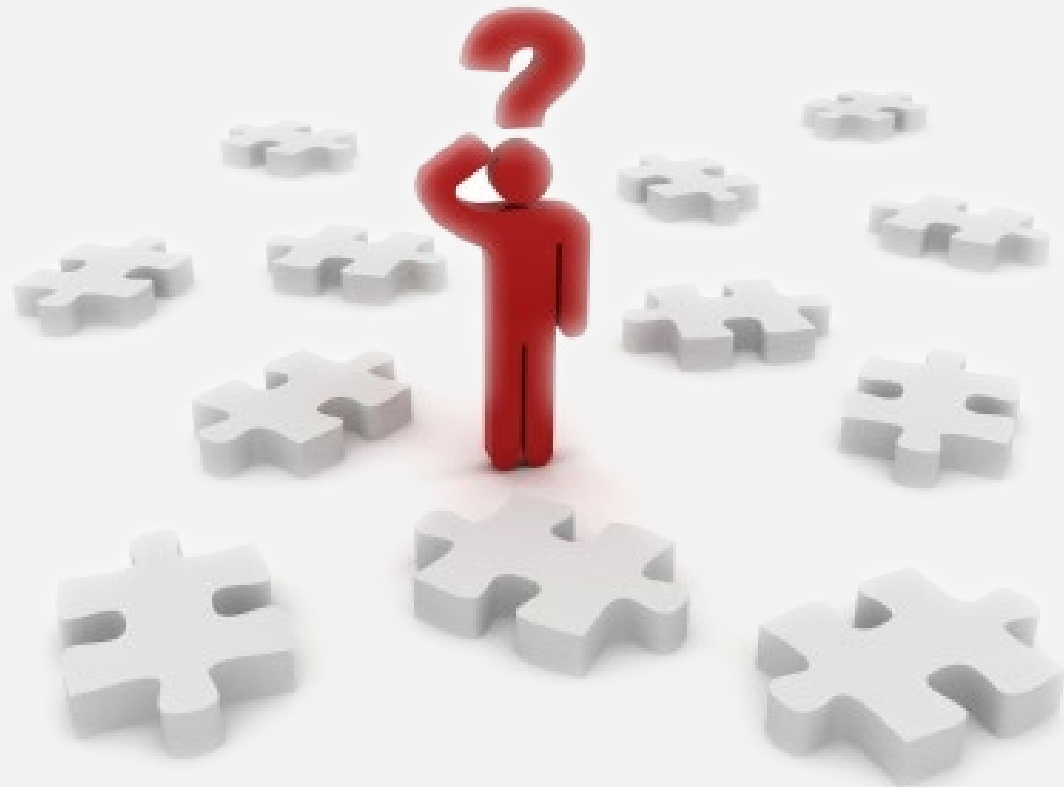
Disinfectant Game – The Game Rules

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.



Problem Solving – Logical Flow



How do we get started?



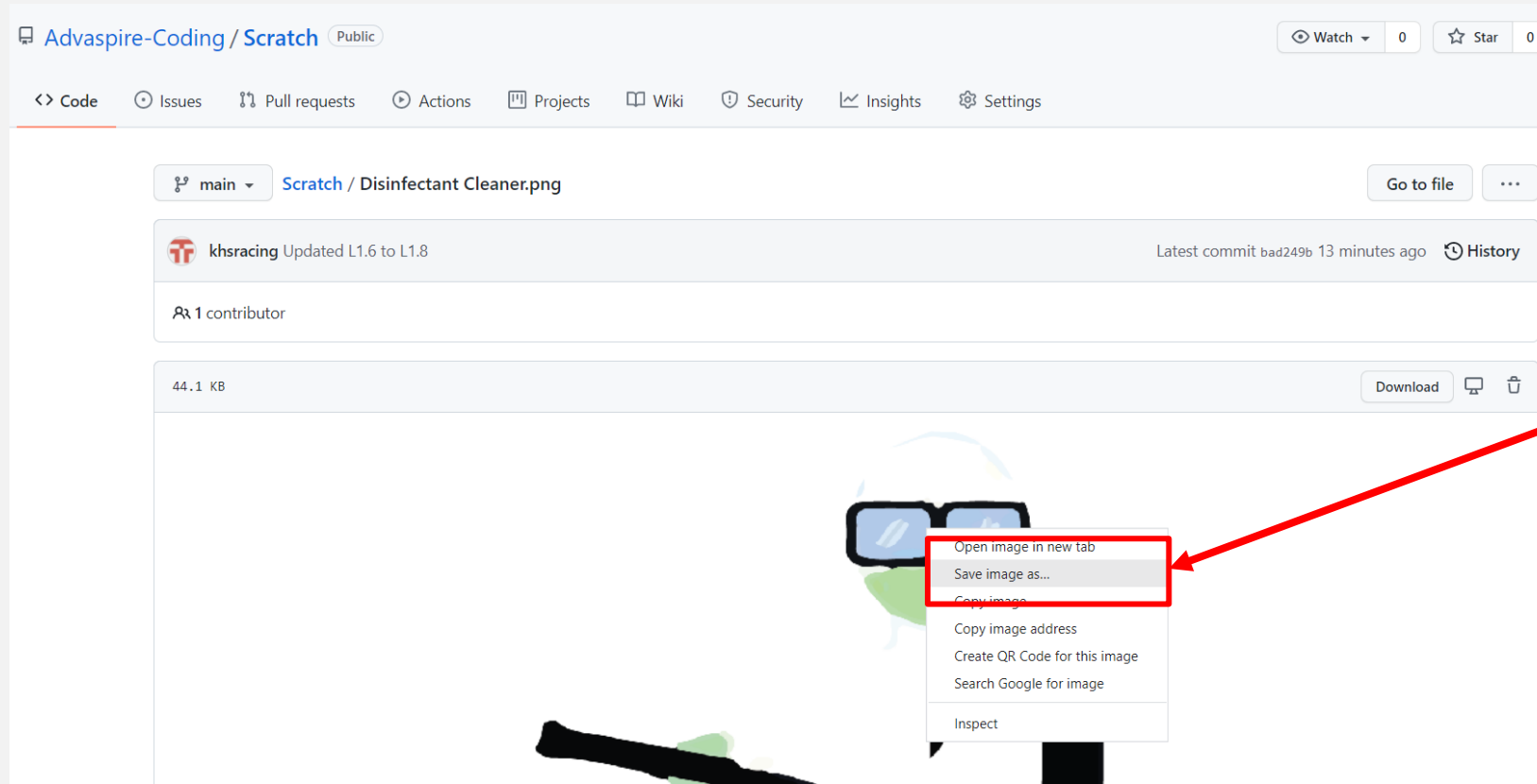
1. Get all sprites in place

Lesson 5 - Interactive Story - Cat vs Bat - <https://git.io/Ju5ZK>
Lesson 6 - Smooth Motion Control I - <https://git.io/Ju9ig>
Sprites for Lesson 6 - Disinfectant Cleaner -> <https://git.io/Ju9iD> Virus -> <https://git.io/Ju9iF>

First steps, go to our discord Group and download virus and Disinfectant Cleaner (click on the link and download the sprites).



1. Get all sprites in place (download from github)

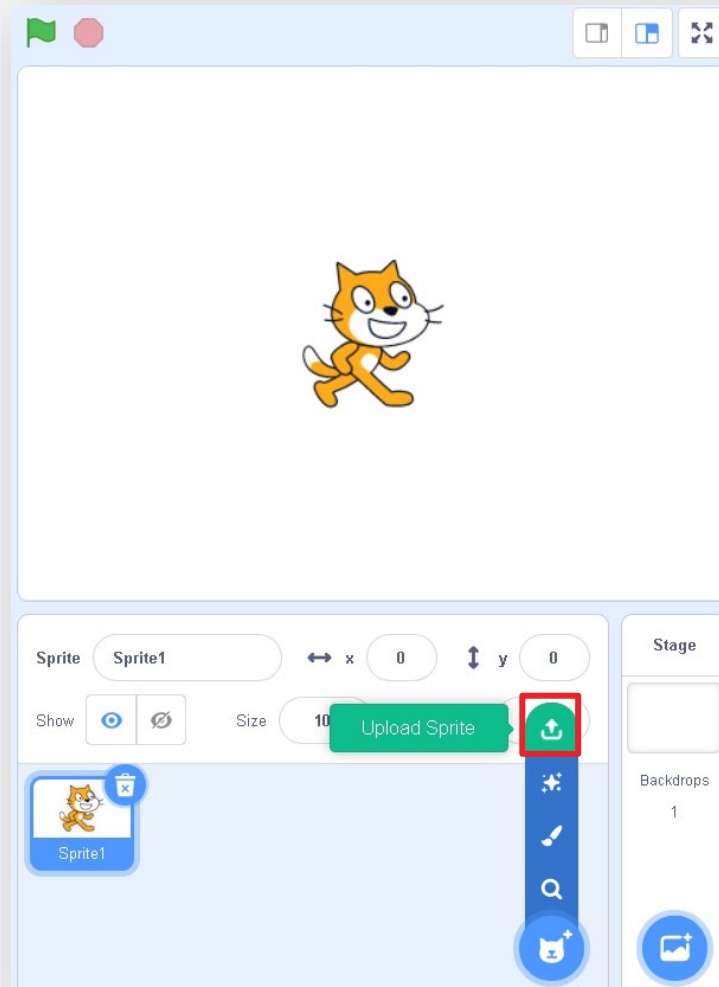


Right click on the picture and select “Save As” to download the sprites.

Do the same way to the virus sprite.



1. Get all sprites in place



Go to your Scratch and upload the Sprite.

You can delete your “Cat”, since we are not going to use it in this game.



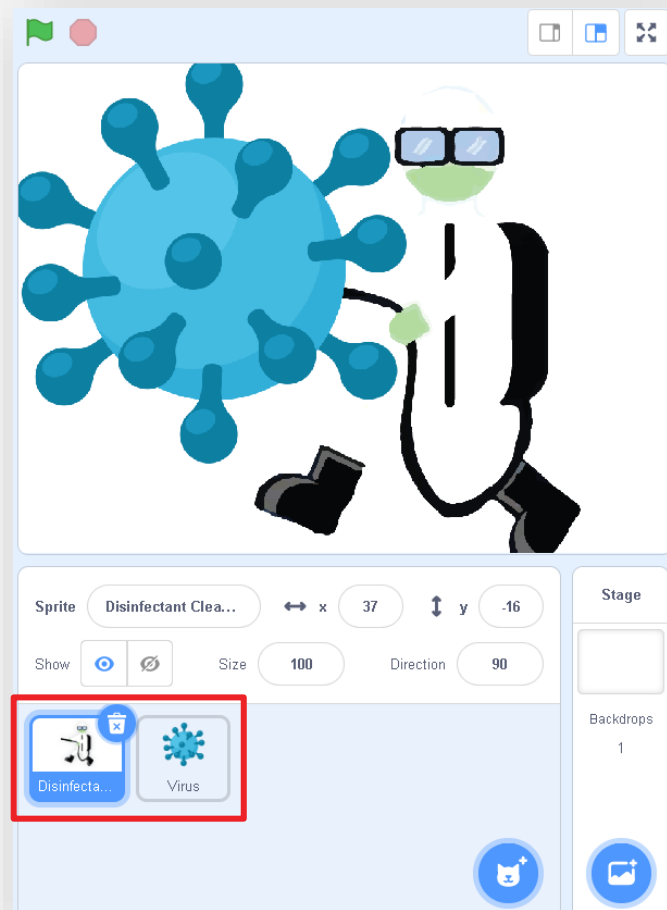
1. Get all sprites in place

This PC > Downloads				
	Name	Date modified	Type	Size
Quick access Desktop Downloads Documents Pictures BNI Level 1 Level 2 Unit 3 (Music Maker)	Today (2)			
	Disinfectant Cleaner	14/9/2021 11:05 AM	PNG File	45 KB
	Virus	14/9/2021 11:08 AM	PNG File	52 KB
	Yesterday (4)			
	Arduino LCD TFT TouchScreen 2.4 Inch SP...	13/9/2021 3:50 PM	WinRAR archive	3 KB
	SPFD5408-master	13/9/2021 3:37 PM	WinRAR ZIP archive	193 KB
	arduino-1.8.16-windows	13/9/2021 3:21 PM	Application	116,212 KB
	maxwell	13/9/2021 11:33 AM	PNG File	519 KB
	Last week (12)			

Upload both virus and disinfectant cleaner into your Scratch.



1. Get all sprites in place

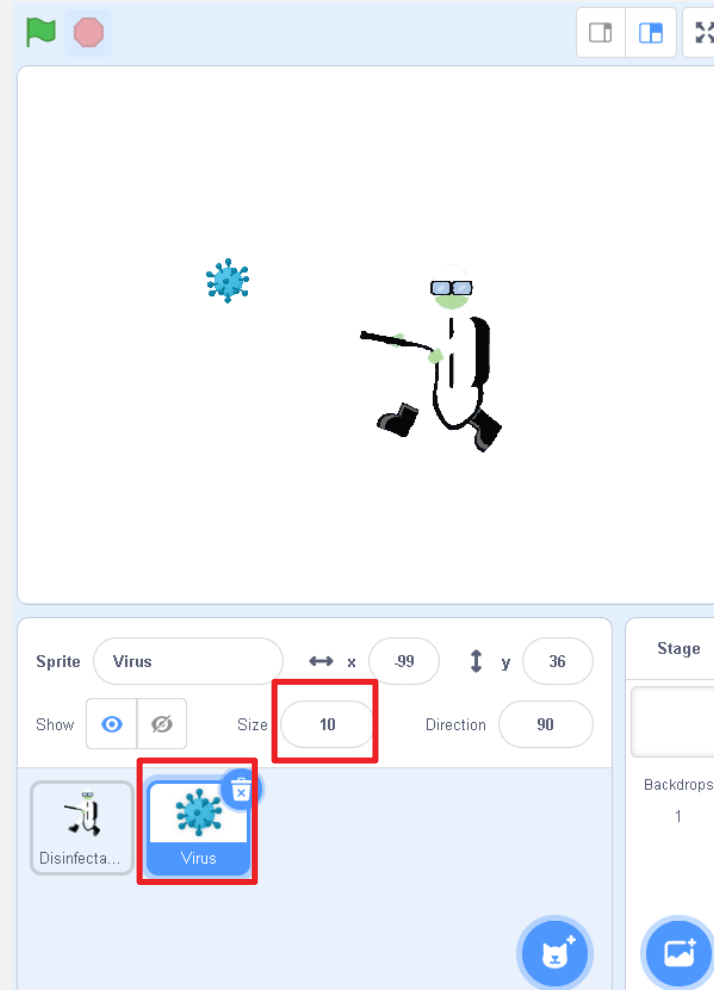
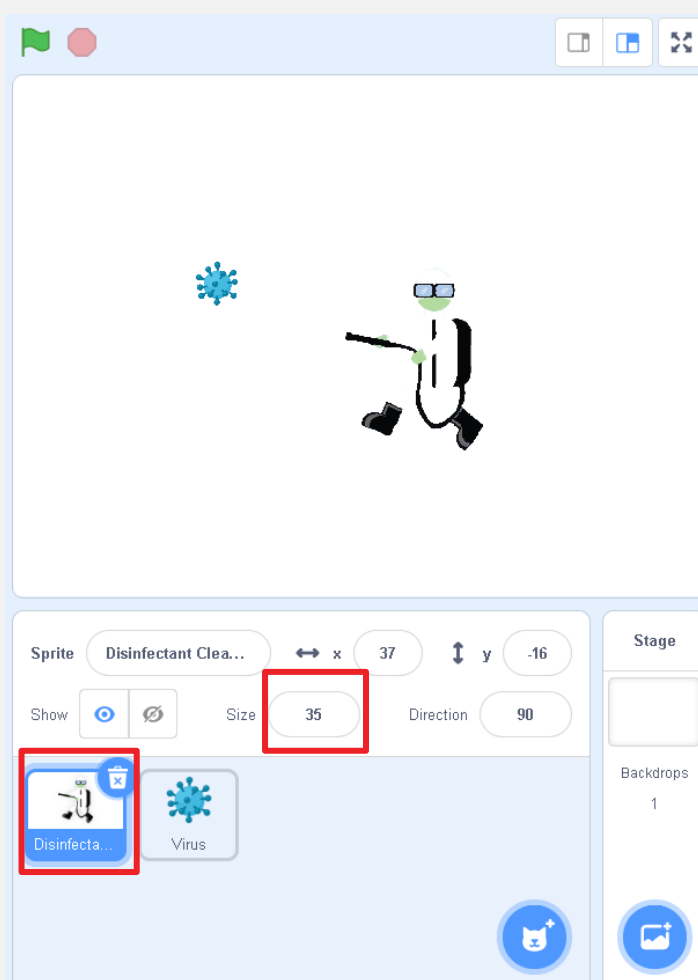


After uploading, you will see something like this.

Both Sprite are very big to display on the Stage.



1. Get all sprites in place

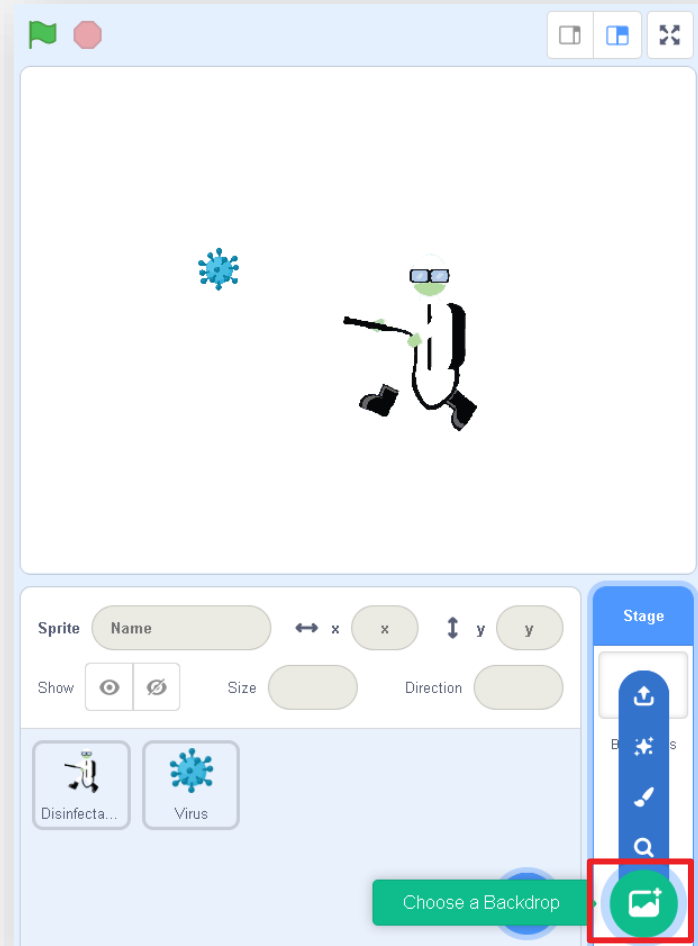


Change the size of the disinfectant cleaner to 35.

Then change the size of the virus to 10.



2. Add Backdrop



Add a backdrop for your game. (You choose)

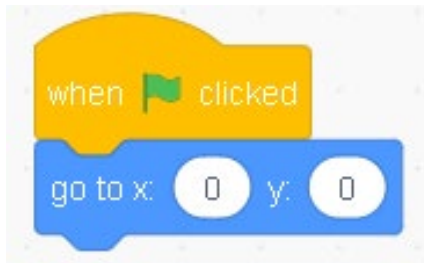
I will use "Blue Sky 2" in my tutorial.





3. Code your Disinfectant Cleaner

Script:



Game Rules #2:

Your cleaner starts at the centre.

Drag a “**when flag clicked**” event block followed by “**go to x: 0, y:0**” block.



3. Code your Disinfectant Cleaner

Script:



a

b

```
when green flag clicked
  go to x: 0 y: 0
  set rotation style left-right
  forever loop
    if key right arrow pressed? then
      change x by 3
    if key left arrow pressed? then
      change x by -3
    if key up arrow pressed? then
      change y by 3
    if key down arrow pressed? then
      change y by -3
```

a

Game Rules #1:

You are able to control your cleaner with up-down-left-right arrow keys (rotation style = left-right).

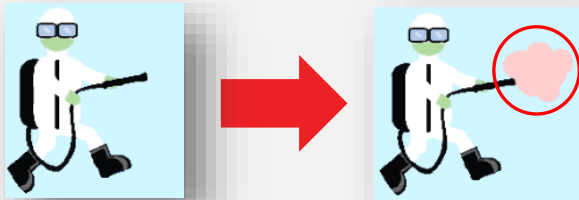
b

Forever-if control loop (like what we did for the cat in previous lesson)

The movement speed is up to you, I will set change by 3 in every movement in this game.



3. Code your Disinfectant Cleaner

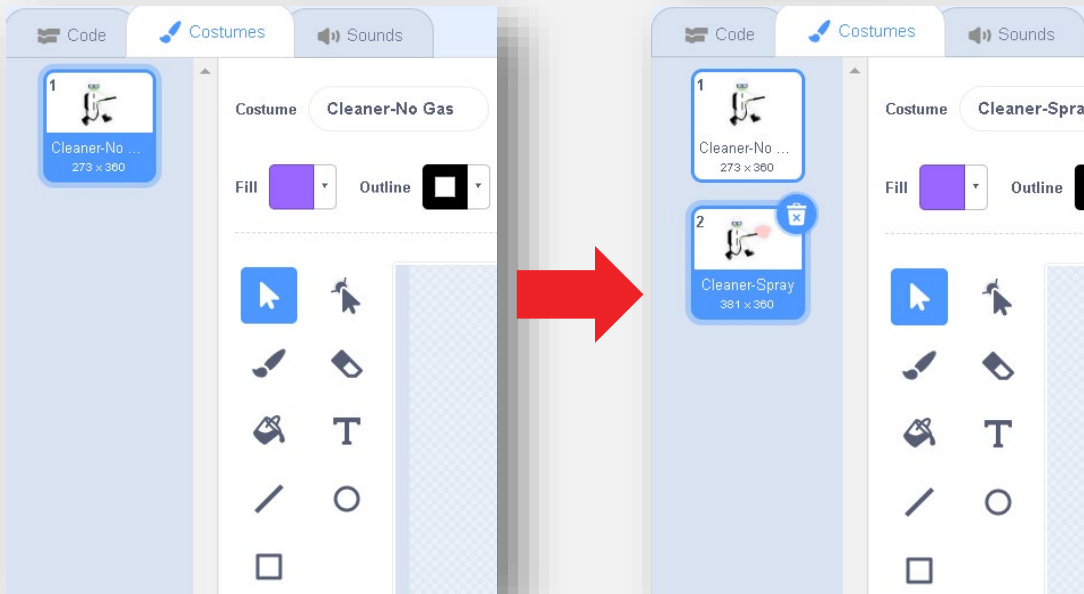


Game Rules #3:

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

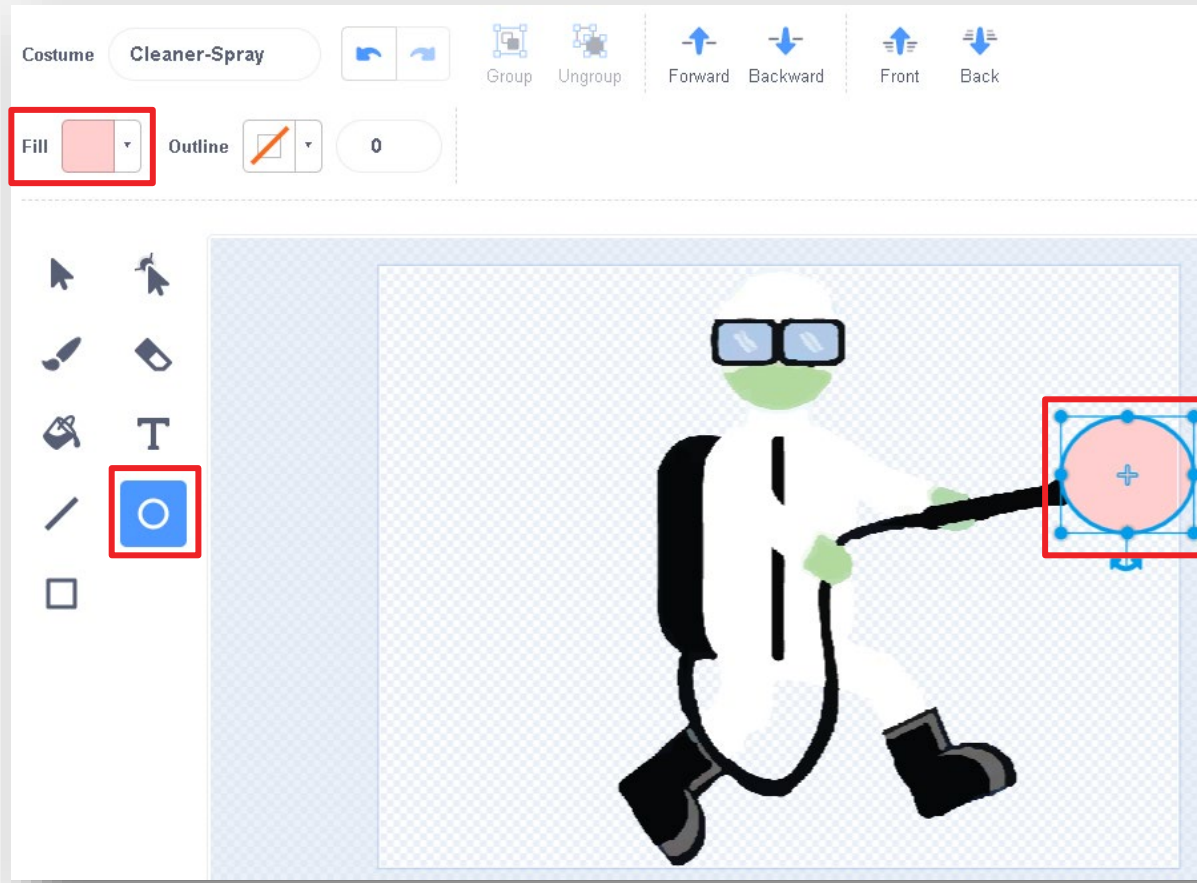
Flip your costume so that your cleaner is facing to the right.

You need duplicate then first costume and add the spraying gas in front of the tip.





3. Code your Disinfectant Cleaner

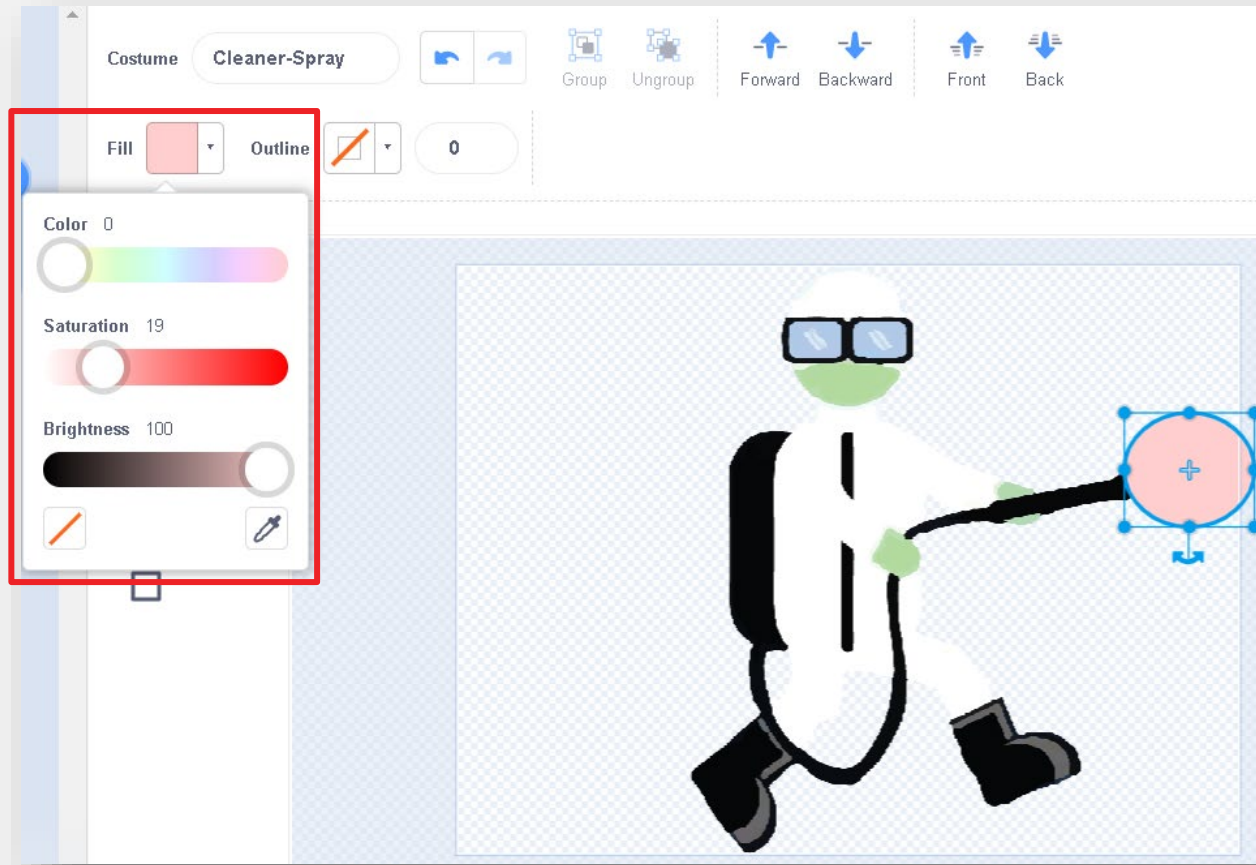


Draw the gas with few white circles

Select the circle tool and drag out a circle.



3. Code your Disinfectant Cleaner

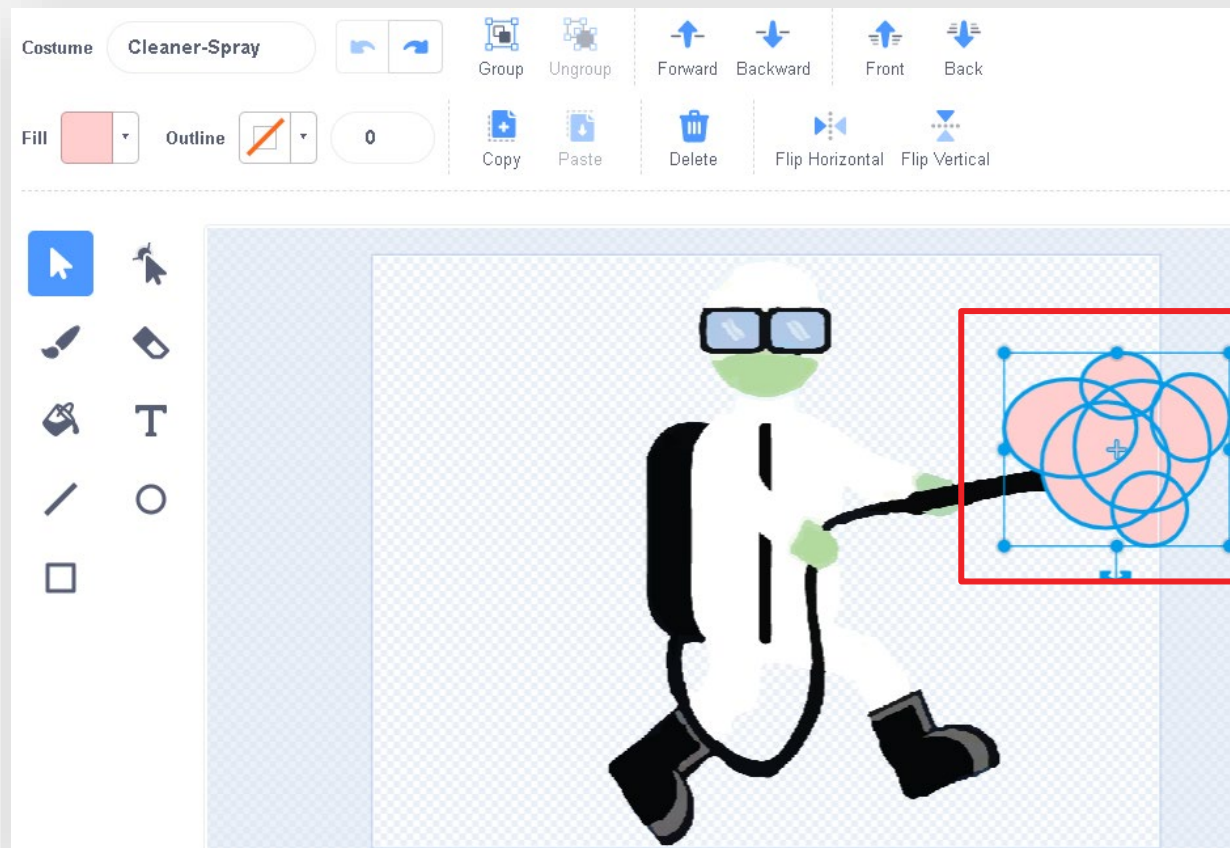


Click the fill, and drag the Saturation to 19

You will see your circle become pink colour



3. Code your Disinfectant Cleaner



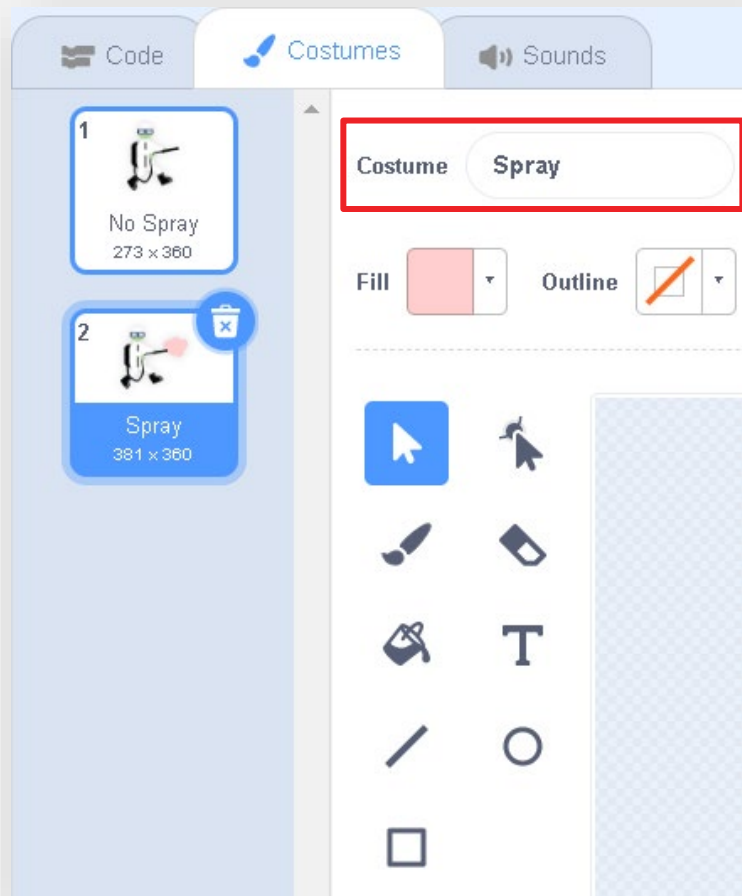
Draw another 5~6 circles to make like it's spraying some disinfectant gas.



You can see the gas form on the stage with a blue backdrop.



3. Code your Disinfectant Cleaner



I have changed the name for the first costume to “No Spray” and “Spray” for the second costume.

Now you will have 2 costumes over here, and you need to program that when you press <space> on your keyboard, it will switch it to “Spray” costume, otherwise it will keep showing the “No Spray” only.

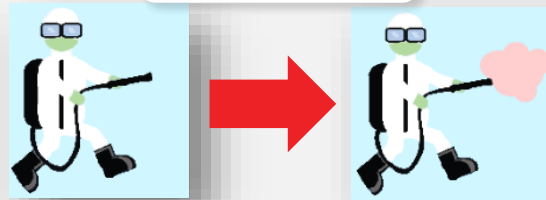


Script:



3. Code your Disinfectant Cleaner

<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.



Script:



3. Code your Disinfectant Cleaner

Game Rules #4:

If the cleaner hits the edge, bounce back.

Add “if on edge, bounce” block after the <space> if-else statement (still in the forever loop).



3. Code your Disinfectant Cleaner



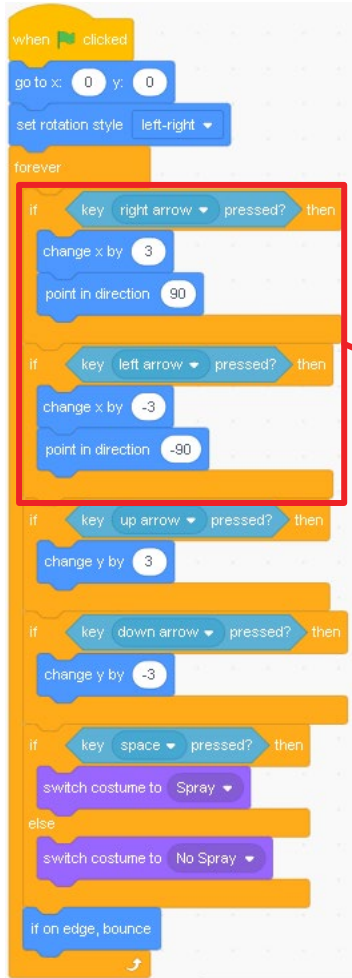
Game Rules #5:

When your cleaner move to the right, it will face right, otherwise it will face to the left.

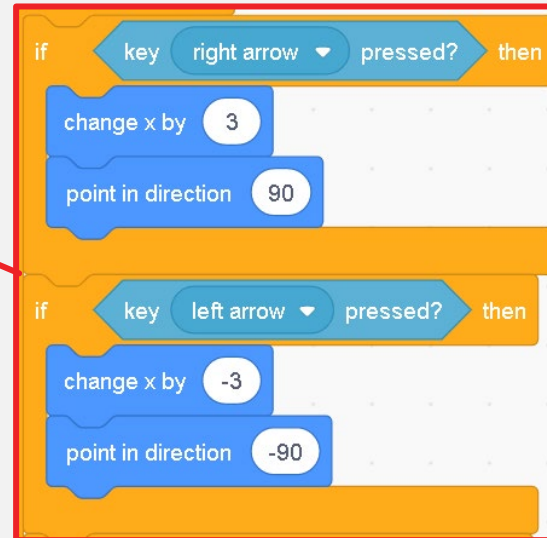
As we already set the rotation style to left-right, we can change its position to 90° when we press <right> arrow, and change to -90° if pressing <left> arrow.



Script:



3. Code your Disinfectant Cleaner



Game Rules #5:

When your cleaner move to the right, it will face right, otherwise it will face to the left

We will add a “point in direction 90°” in the <right arrow> if-statement.

Then add “point in direction -90°” in the <left arrow> if-statement



Disinfectant Game – The Game Rules

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.

We have settled first 5 rules for the disinfectant cleaner.

We are going to program the virus now.



4. Code your Virus

Script:



Game Rules #6:

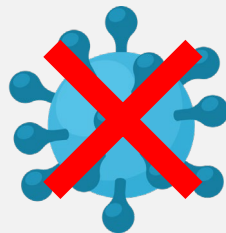
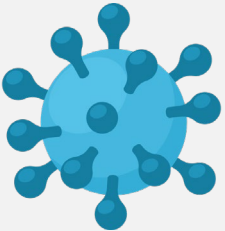
There will be 4 viruses on the stage on the start and all of them **spawn randomly**

It will spawn randomly on the start, so we will just give a “**go to random**” position after “**flag**” pressed.

**It will need 4 viruses on the start, so we will code the full program for the virus first, then only duplicate another 3.*



4. Code your Virus



Game Rules #7:

If disinfectant hit the virus with spraying costume, the virus will shout “No~~” then disappear.

Game Rules #8:

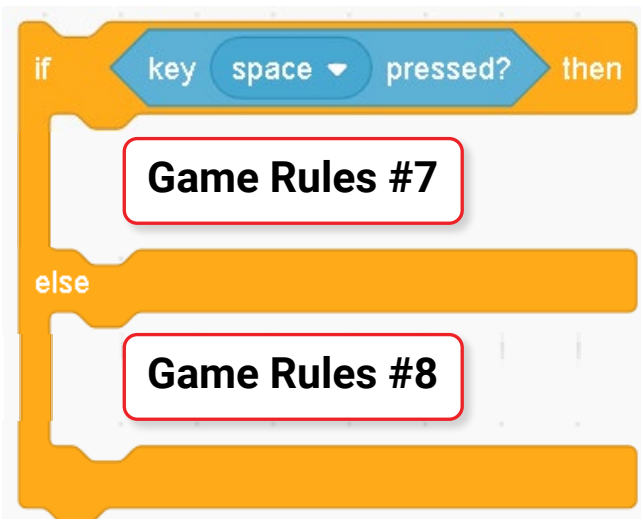
The virus will say “I’m not afraid of you!” and remain there.

These 2 rules basically mean that the virus only will be killed by the spray, otherwise it won’t disappear.



4. Code your Virus

Script:



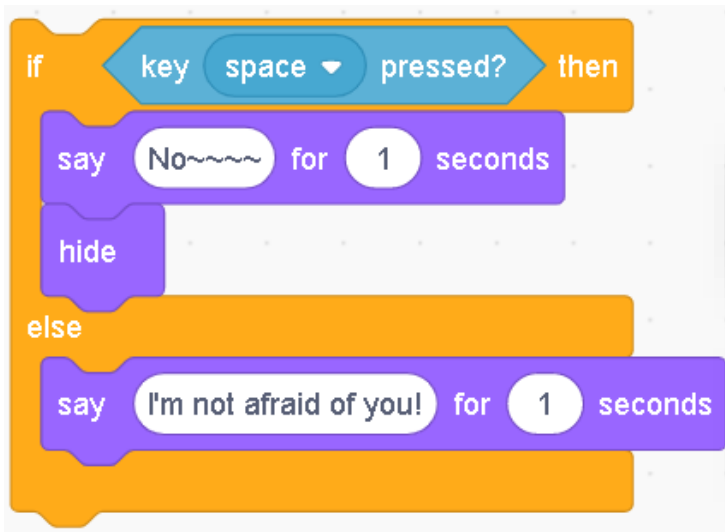
Since we the virus won't know if the "Spray" costume is touching it or "No Spray" is touching it.

One of the ways to determine if the costume is "Spray" or "No Spray" is to check if <space> key is pressed or not. Since we code our disinfectant cleaner to change costume to "Spray" when <space> key pressed and it will change back to "No Spray" if no <space> is pressed.



4. Code your Virus

Script:



Game Rules #7:

Say "No~~~~" and hide itself (disappear from the screen)

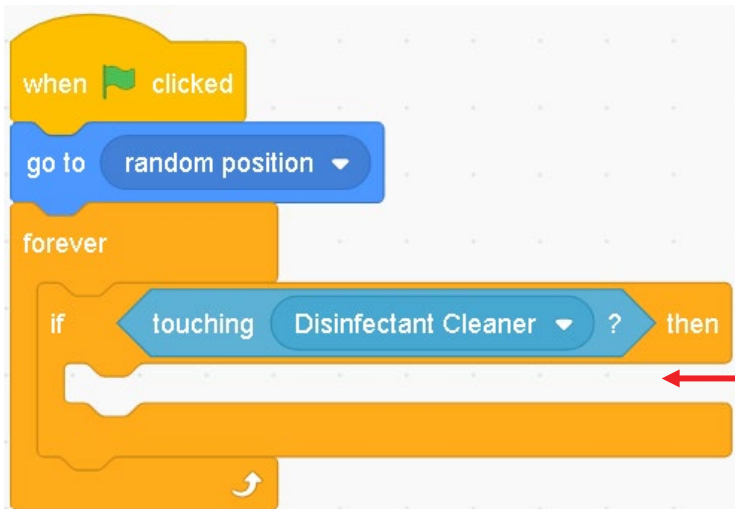
Game Rules #8:

Say "I'm not afraid of you!" and remain there.



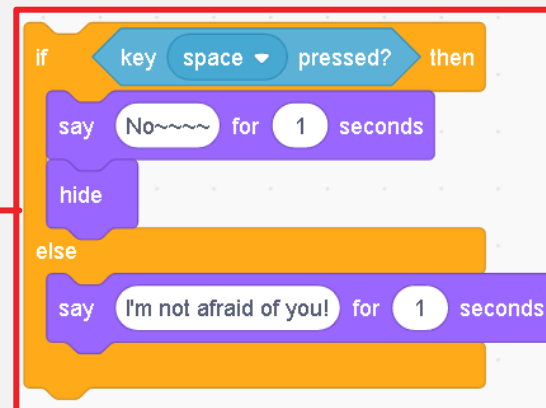
4. Code your Virus

Script:



The if-else statement only check if the costume of the disinfectant cleaner is "Spray" or "No Spray".

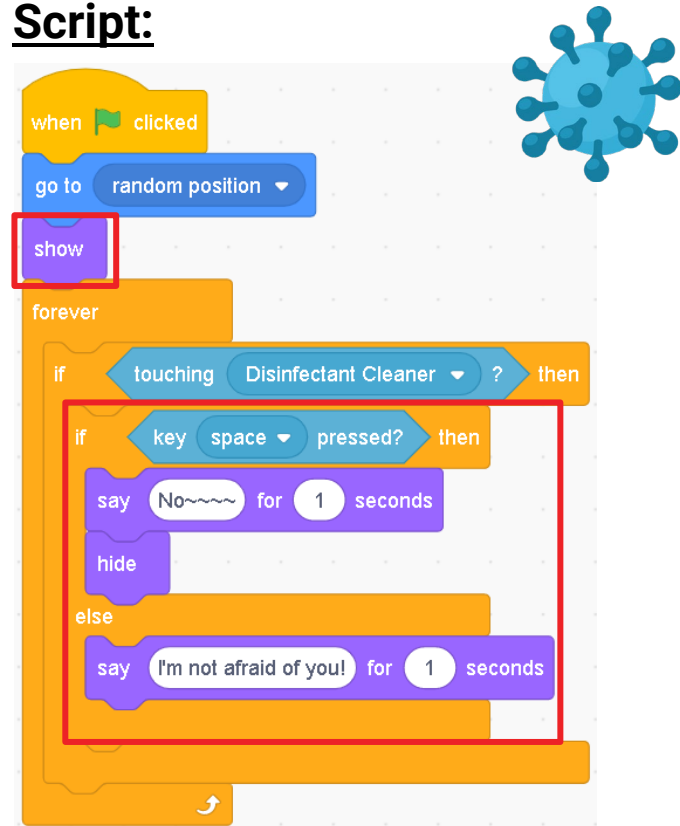
So you need to add a forever-if loop to check whether the virus is touching the disinfectant cleaner.





4. Code your Virus

Script:

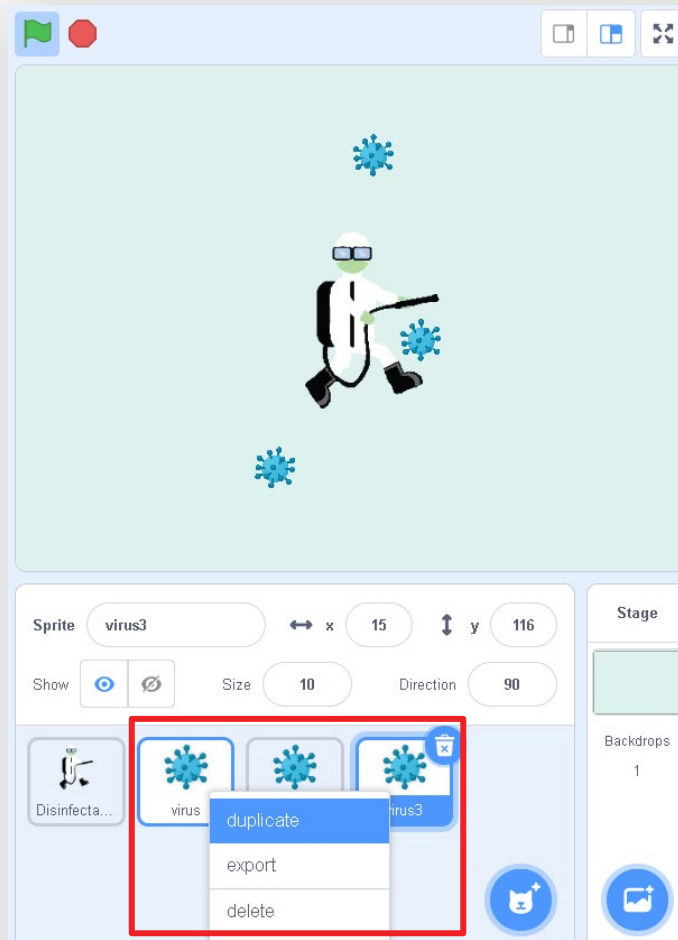


Remember to add a “**Show**” block at start, because after you kill all viruses, all of them will hide themselves and they will still be hidden in next game.

Then put the if-statement into the touching disinfectant cleaner loop.



5. Duplicate viruses



Game Rules #6:

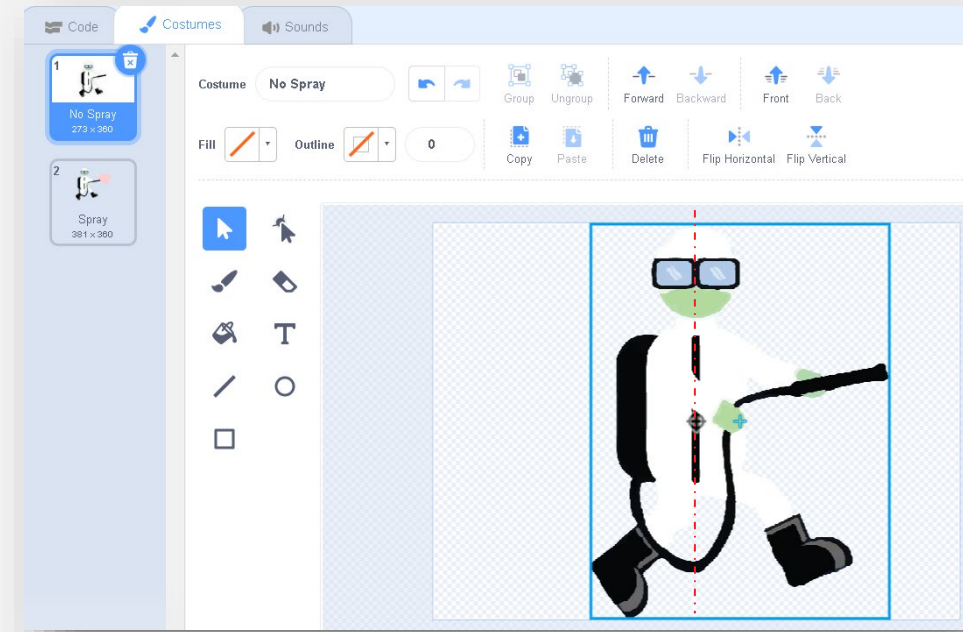
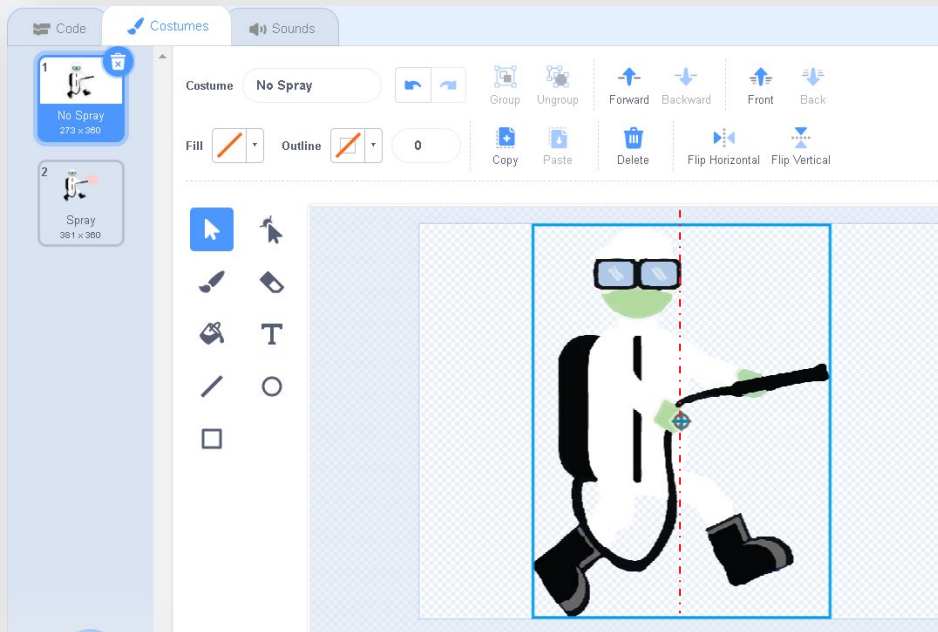
There will be 4 viruses on the stage on the start and all of them spawn randomly

Duplicate other 3 viruses.



6. Adjust the costume

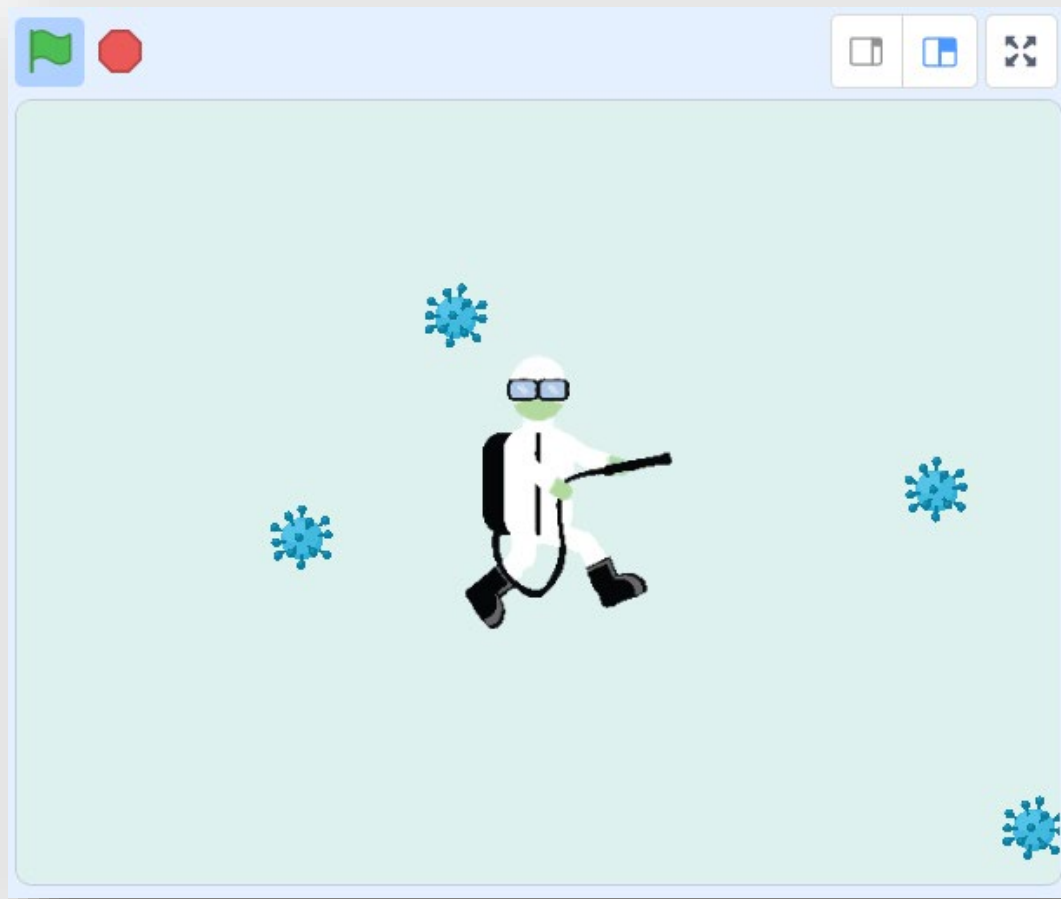
Align body as the centre to make ease the flipping.



Align your “**Spray**” and “**No Spray**” costumes to make the body as centre position.

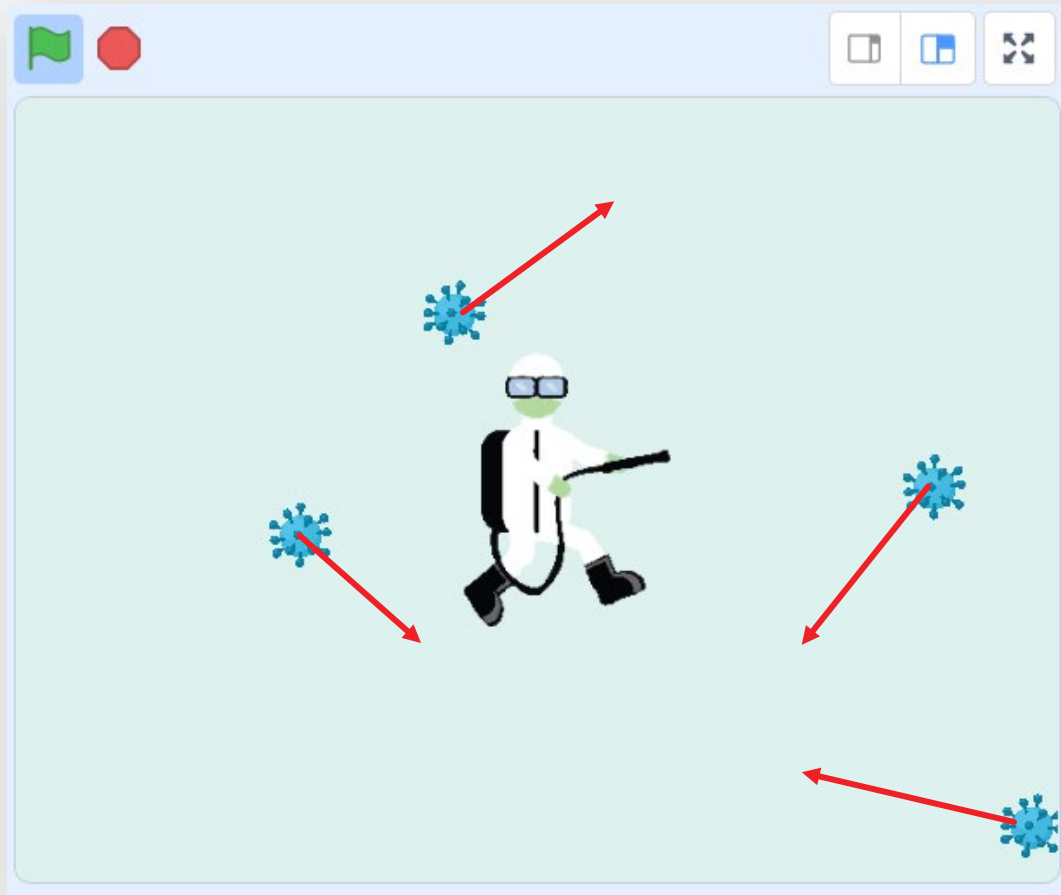


7. Try the game





8. Make Virus Move Randomly



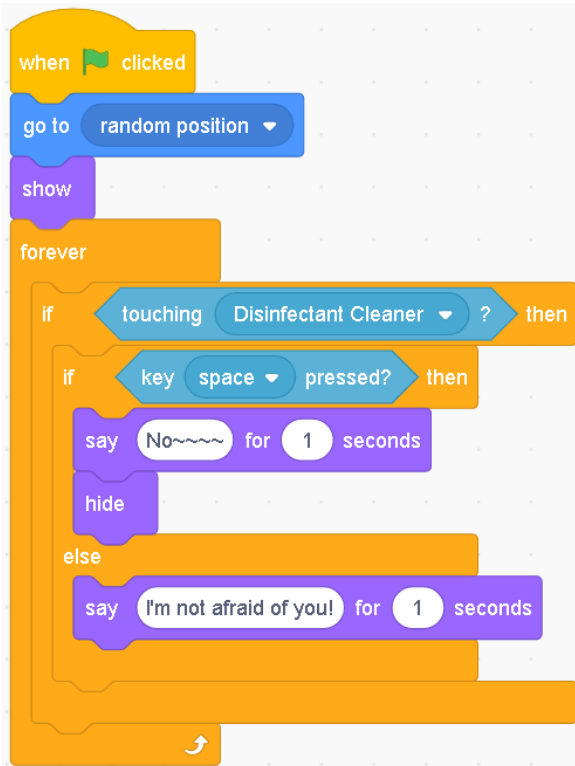
Now you want to make the virus move randomly on the platform

How should you make the virus move?

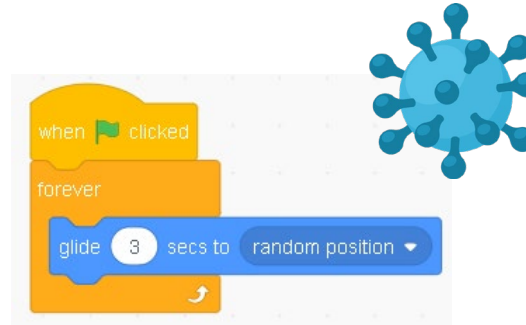


8. Make Virus Move Randomly

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.

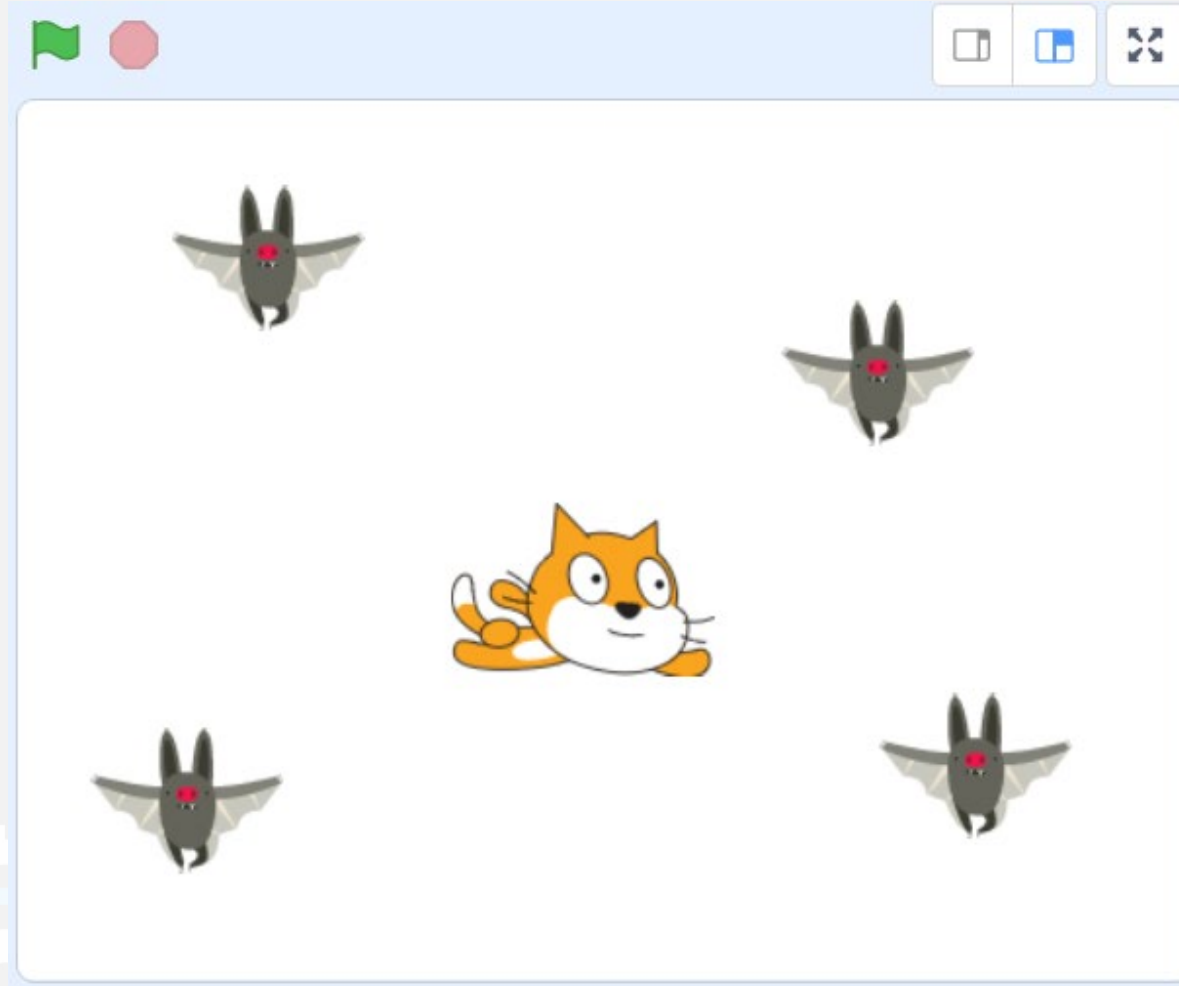
So as long as the virus is still on the stage, it will keep gliding to random position with 3 seconds.

Remember to add this program to all other viruses.



ASSIGNMENT *for*

Lesson 7



L7 – Mission

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.

[game rules on next page>>](#)

L7 – Mission – Game Rules

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



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 :)