

GRAPHITE ACADEMY  
PRESENTS

# STAY HOME & CODE



Parent's Manual

# WELCOME MESSAGE



Dear Parents,

Thank you for downloading this 'Stay Home' lesson guide for Scratch. We hope that our content provided will benefit you greatly during this 'Stay Home' season.

At Graphite Academy we believe that learning is a lifelong journey and a team sport. As such we have curated this content with you in mind, to become the teacher, bond and have fun with your child. We hope you find this content useful.

The following manual comes with a separate document for exercises which can be done together with your children. The program is designed to be done over 3 days, 1 hour each with hands-on practice to cement your child's learning.

Feel free to contact us at [www.facebook.com/graphiteacademy](https://www.facebook.com/graphiteacademy) if you have any questions and leave us a positive review if you found this document helpful. Stay safe and keep growing!



Jonathan Ho  
Founder  
Graphite Academy

## Lesson 1

1.	Introduction to Scratch 3.0	2
2.	Overview of Scratch Interface	5
3.	Add a Sprite	6
i.	Choose from Library	6
ii.	Paint a Sprite	7
iii.	Surprise	8
iv.	Upload from File	9
4.	Delete a Sprite	10
5.	Add a Backdrop – 4 Ways	11
6.	Delete a Backdrop	13
7.	Concepts of	
i.	Events	14
ii.	Motion	16
iii.	Control	18
i.	Basic Movements	20
8.	X & Y Principles	23
9.	Motion – ‘Go To’ Block	25
10.	Saving a Project	27
11.	Recap	28



## Lesson 2

1. Concepts of Looks	29
2. Sprite vs Costumes: Are They The Same?	31
3. How to Change Costumes	33
4. How to Add Sounds	38
5. Practice	39
6. Recap	43

## Lesson 3

1. Pokémon Animation	44
2. Recap	58

## Answers for Exercises

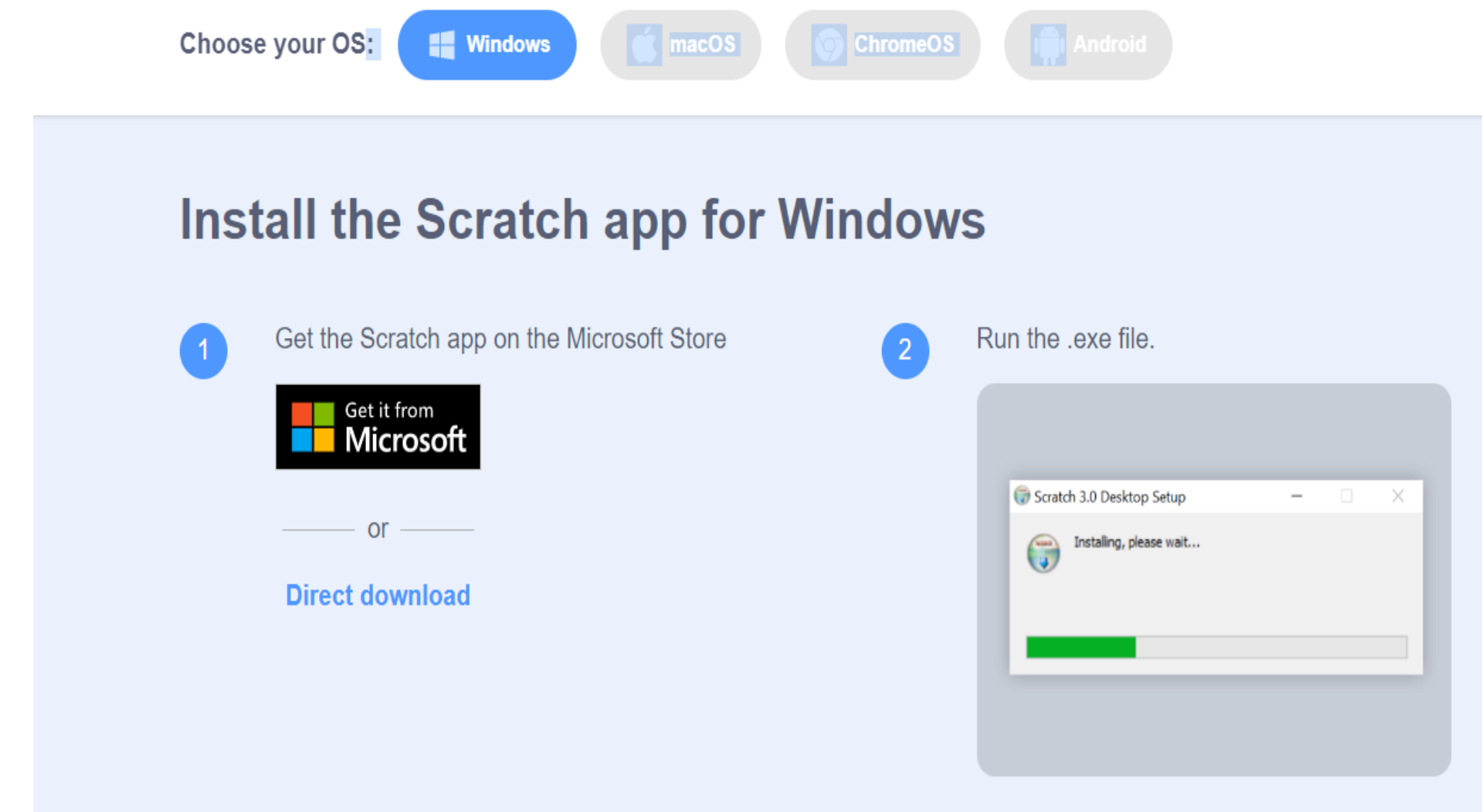
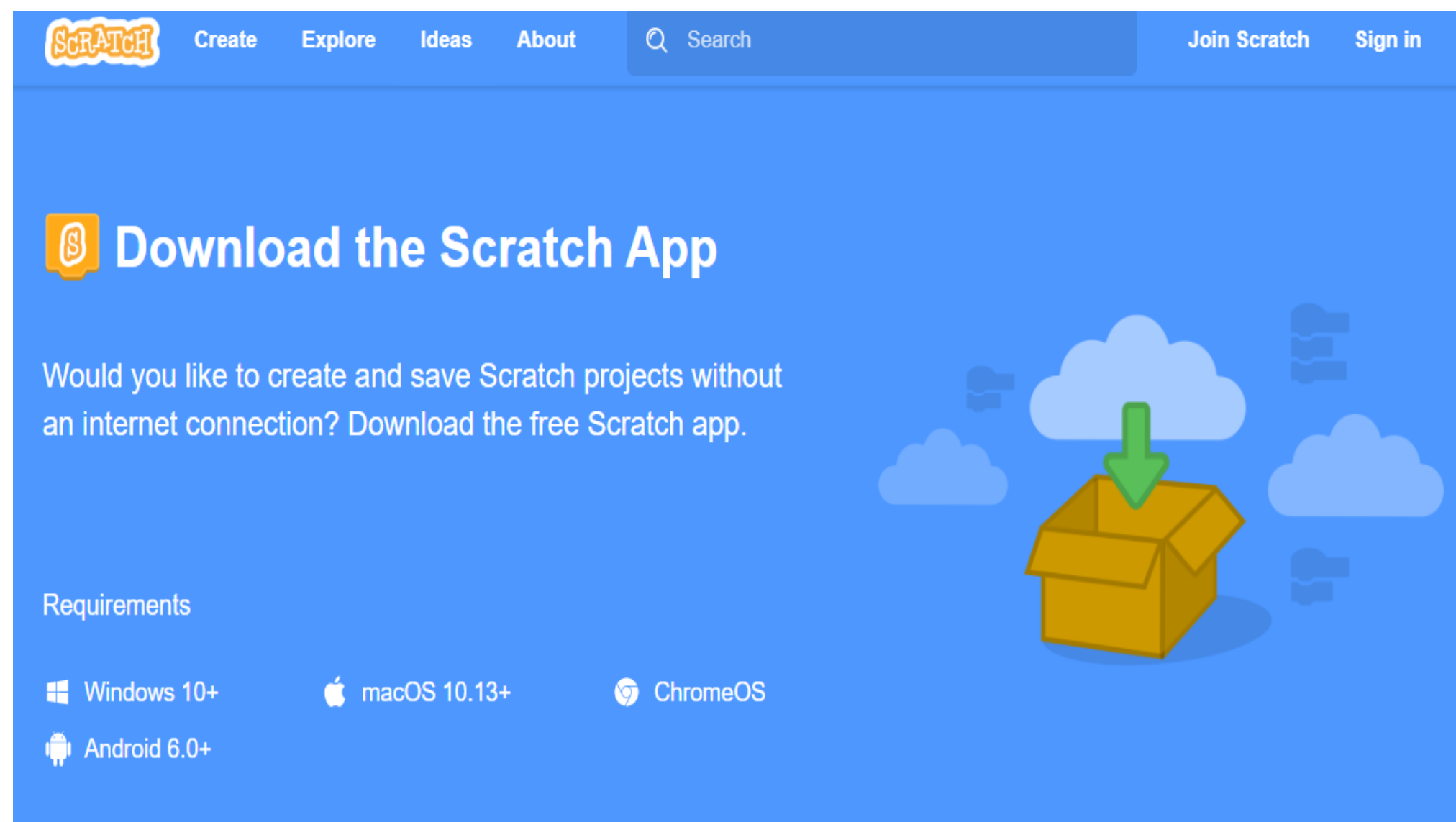
➤ Exercise 1	59
➤ Exercise 2	59
➤ Exercise 3	59
➤ Lesson 1: Challenge	62
➤ Exercise 4	63
➤ Exercise 5	63
➤ Exercise 6	63
➤ Exercise 7	64
➤ Lesson 2: Challenge	66
➤ Lesson 3: Bonus Challenge	67





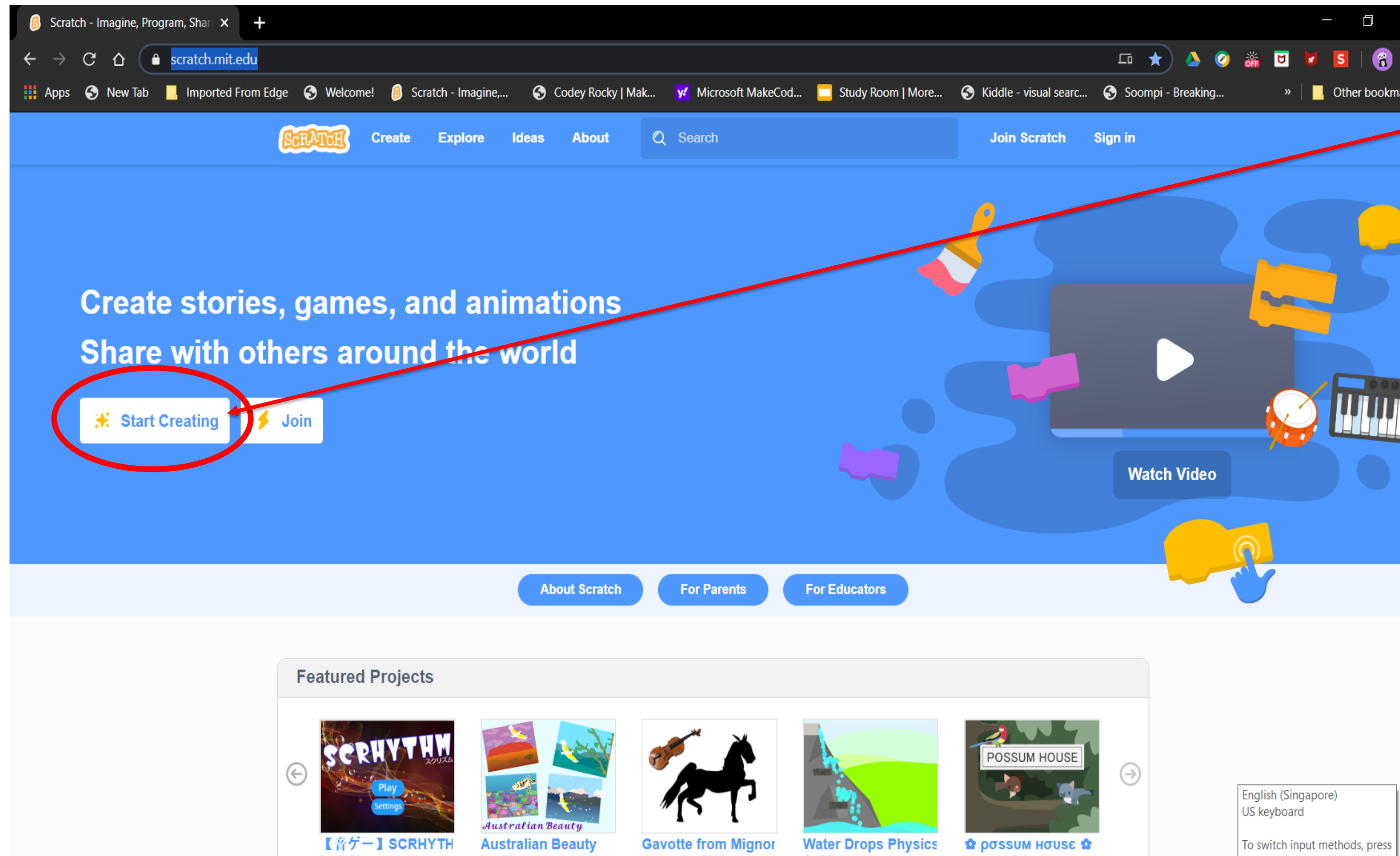
# INTRODUCTION TO SCRATCH 3.0

- ✓ Scratch is a programming language where your children can create their own interactive stories, games and animations.
- ✓ Scratch can be used online from <http://scratch.mit.edu>
- ✓ Or, you can also download Scratch from <https://scratch.mit.edu/download>



# INTRODUCTION TO SCRATCH 3.0

Please go to <https://scratch.mit.edu/>



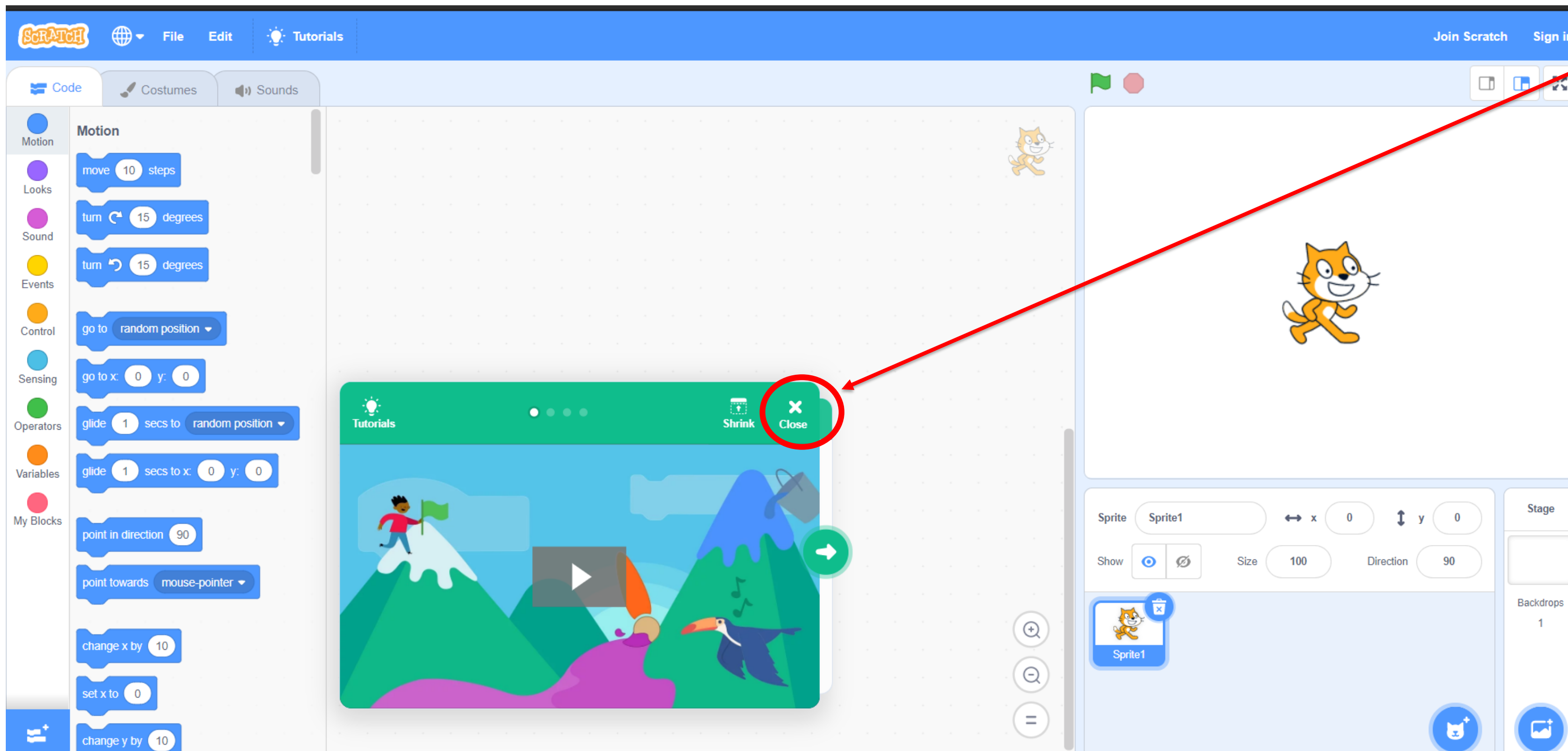
Click 'Start Creating'



# INTRODUCTION TO SCRATCH 3.0

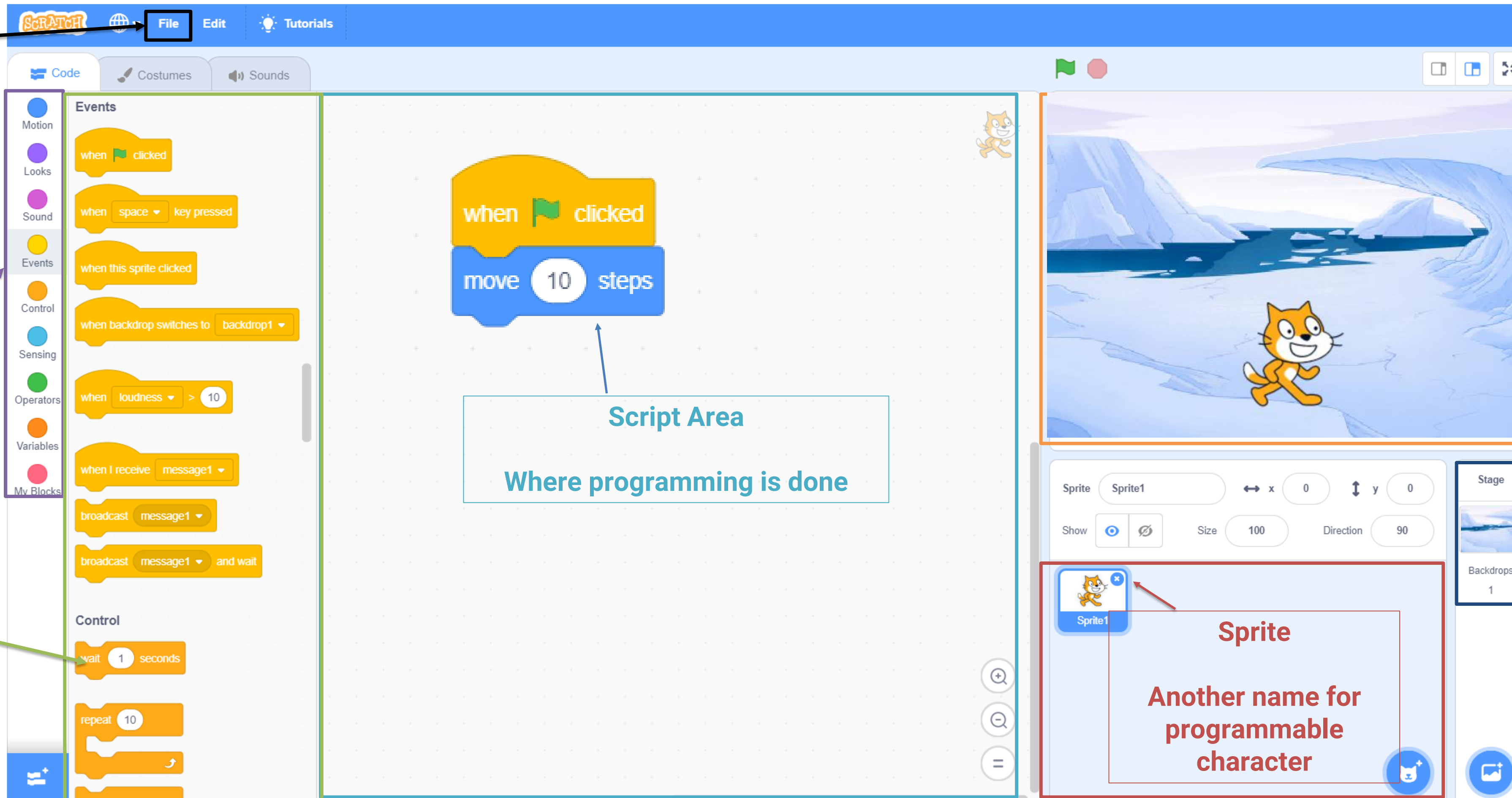
You will be led to this page.

Click 'x' to close it.





Open /  
Save File

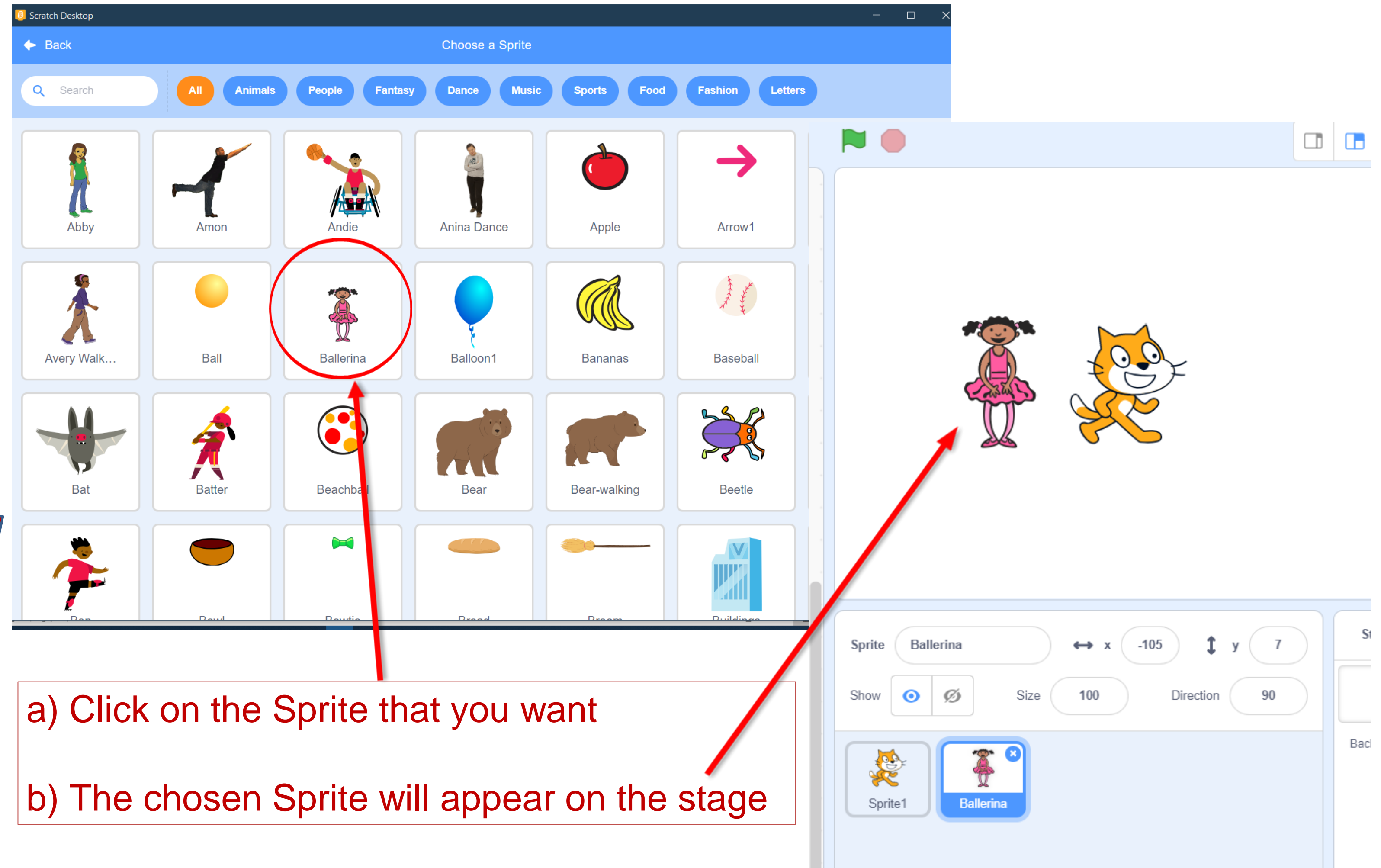
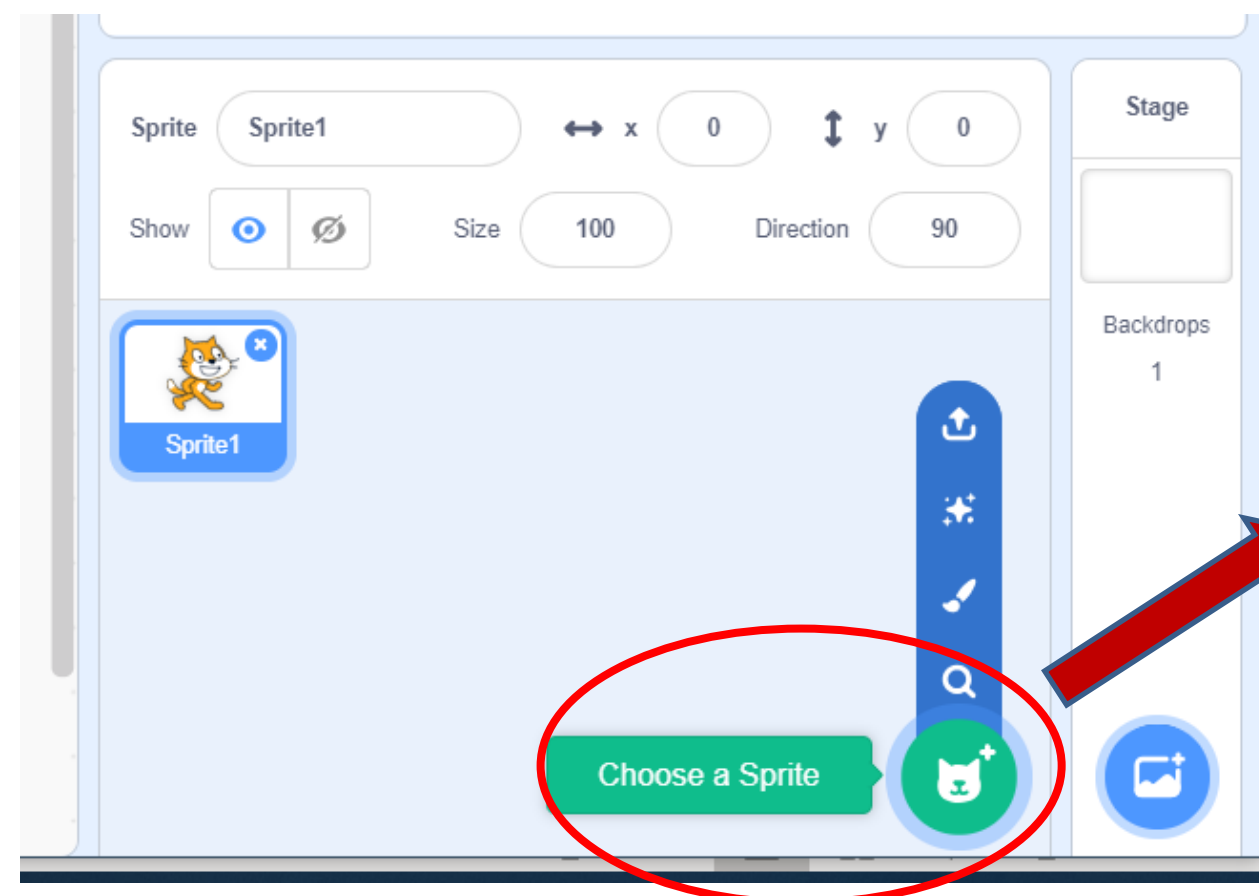




# ADD A SPRITE

There are **4 ways** to add Sprites:

## 1) Choose from Library



a) Click on the Sprite that you want

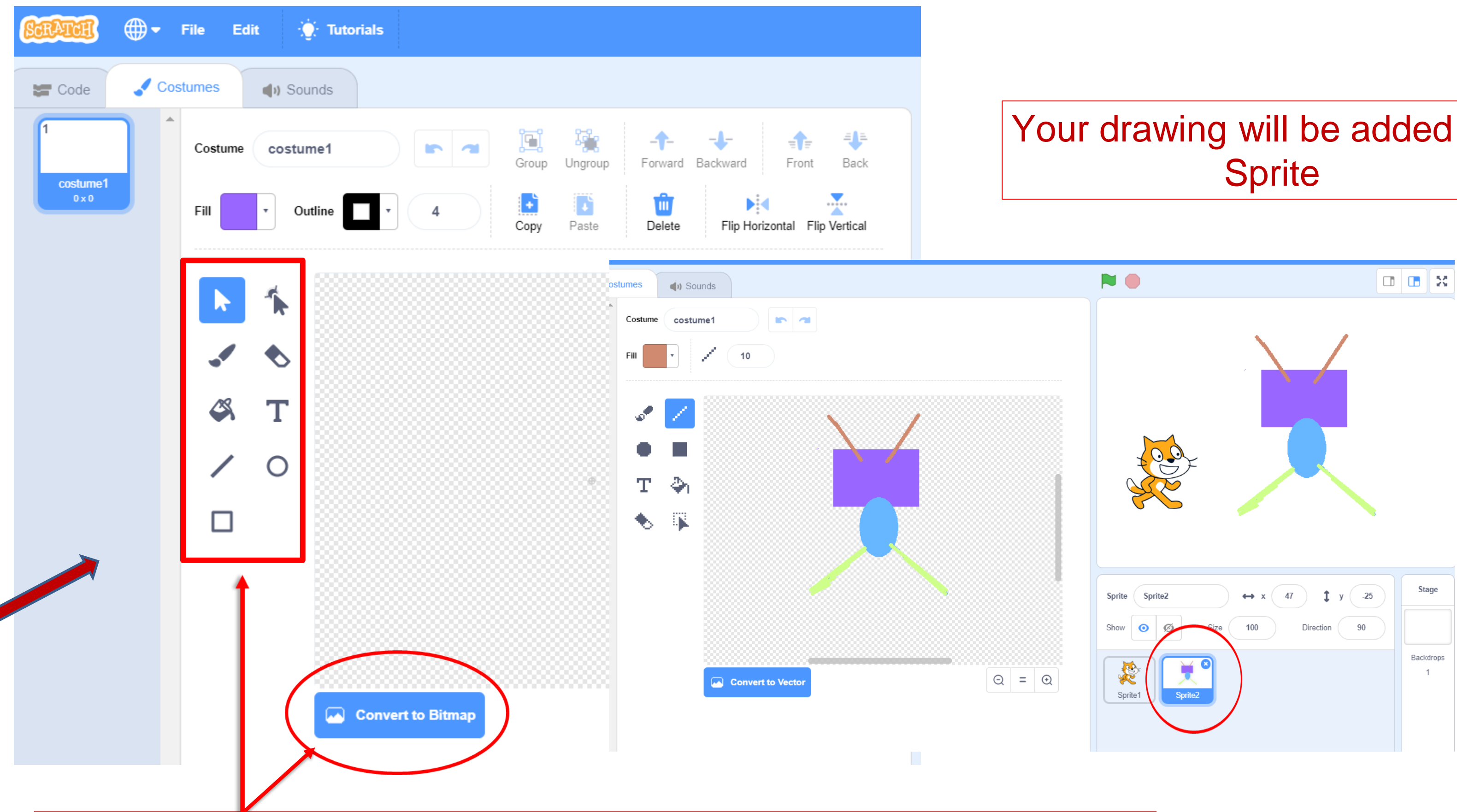
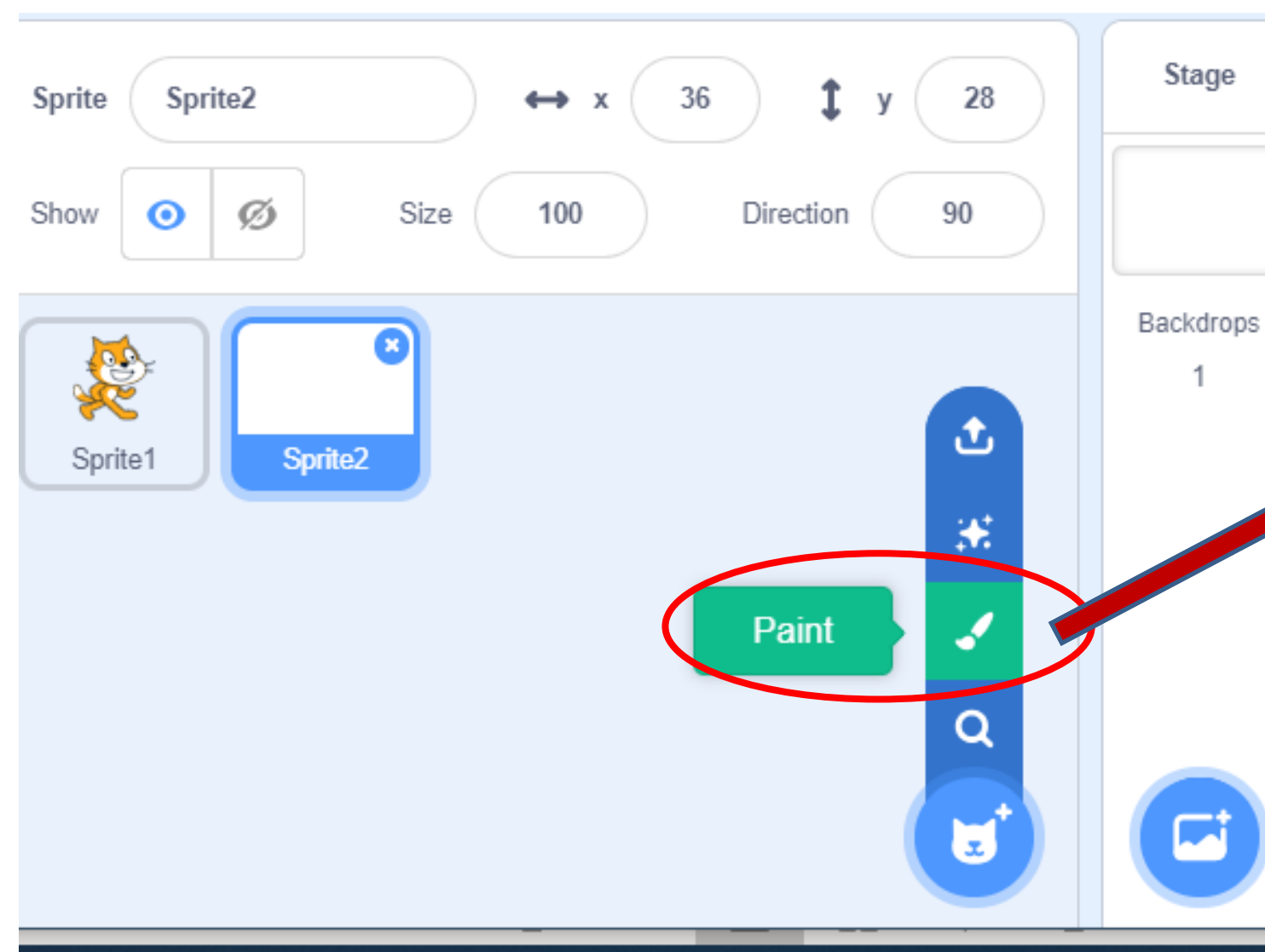
b) The chosen Sprite will appear on the stage



# ADD A SPRITE

There are **4 ways** to add Sprites:

## 2) Paint a Sprite



Your drawing will be added as a Sprite

- Click on 'Convert to Bitmap'. Make sure it is in Bitmap mode.
- Use these tools to draw a Sprite of your choice



There are 4 ways to add Sprites:

## 3) Surprise

The image shows two screenshots of the Scratch interface. The left screenshot shows the Sprites palette with the 'Surprise' button (a green button with a star icon) circled in red. A red arrow points from this button to the right screenshot. The right screenshot shows the stage with a cat sprite and a house icon. The house icon is circled in red, and a red arrow points from it to a text box. Below the stage, the Sprites palette shows the 'Home Button' sprite (a house icon) circled in red. A text box on the right contains the text: 'a) A random sprite will appear on the stage'.

a) A random sprite will appear on the stage

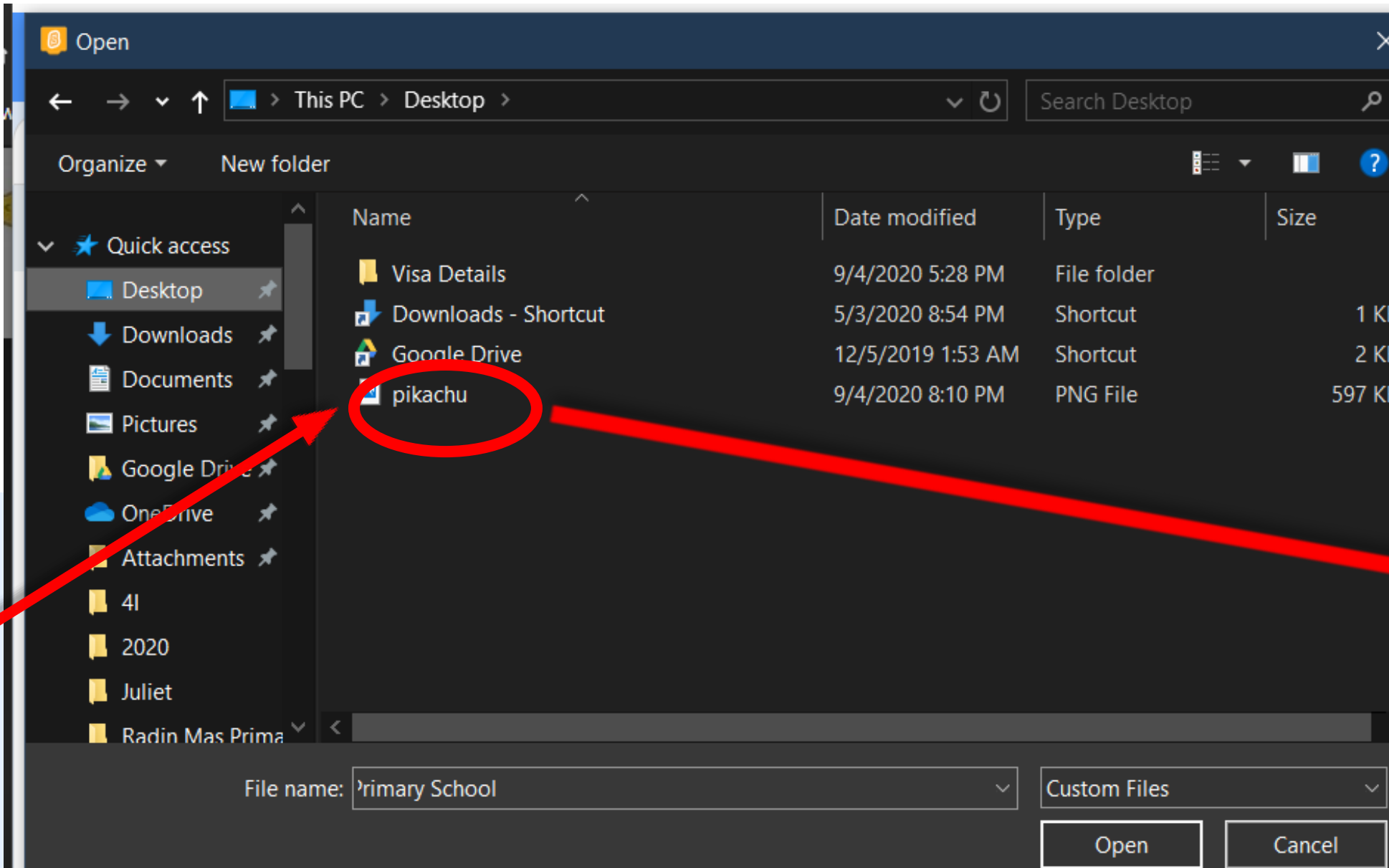
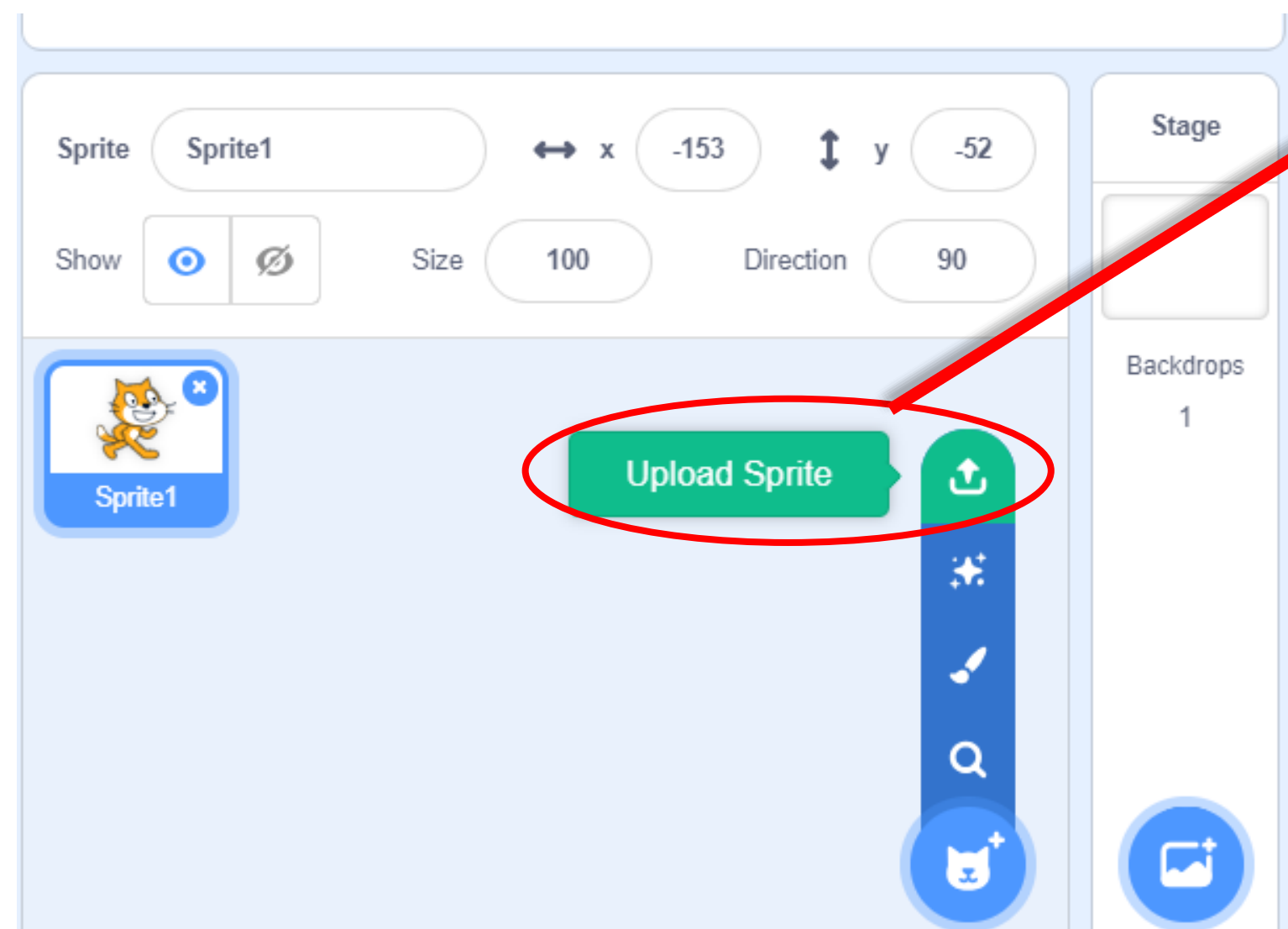




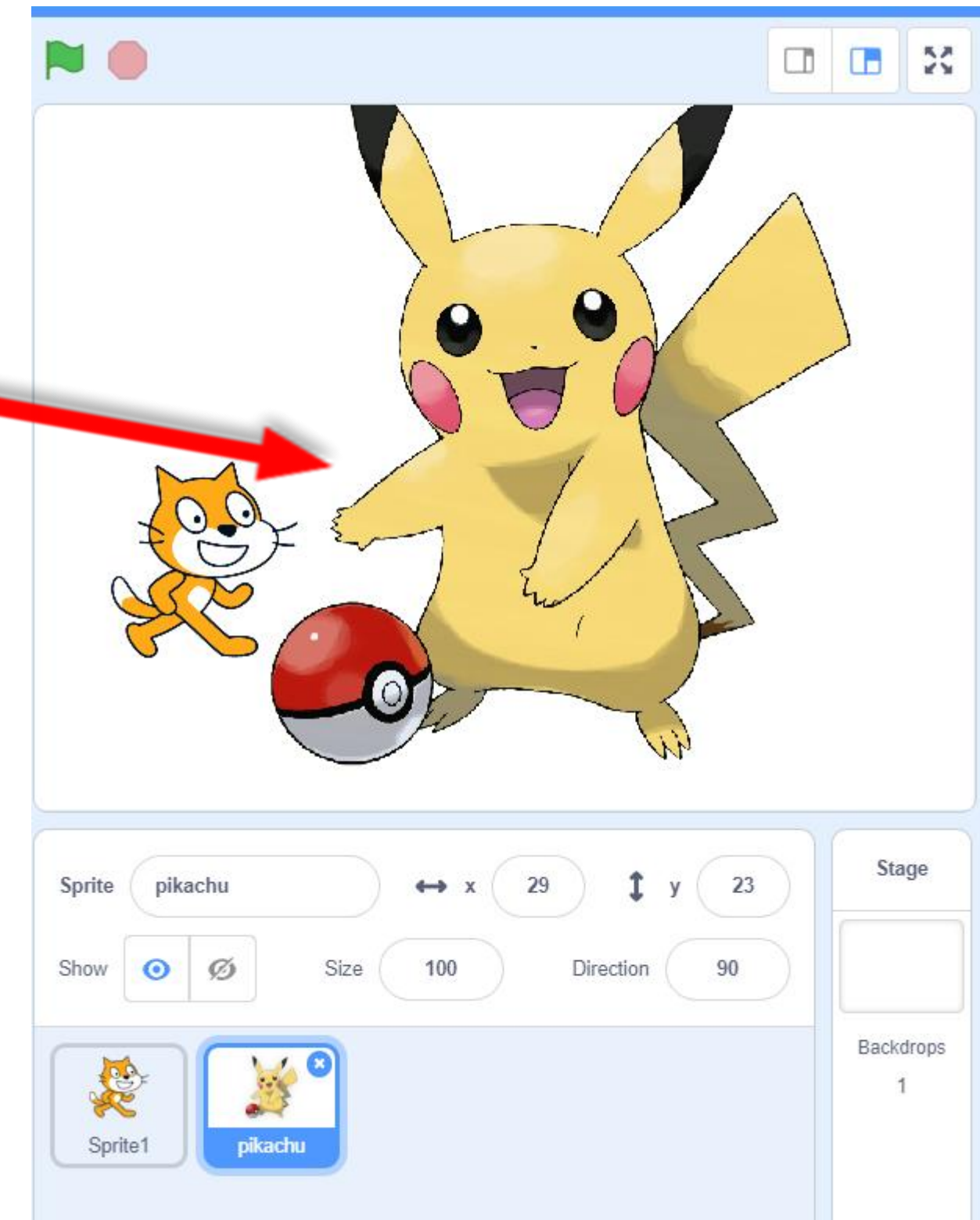
# ADD A SPRITE

There are 4 ways to add Sprites:

## 4) Upload from File



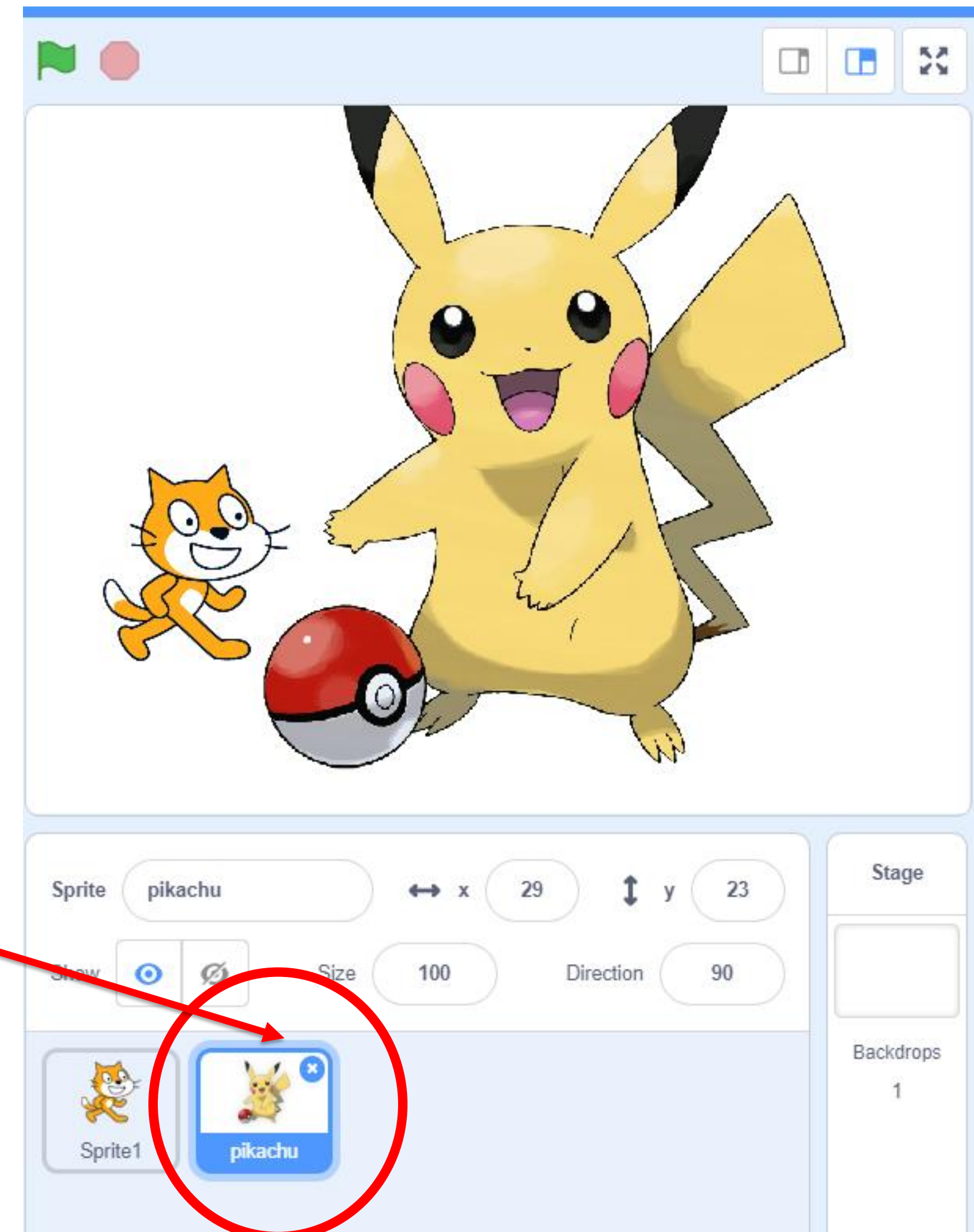
a) You can upload pictures you have on your computer into Scratch as a Sprite.



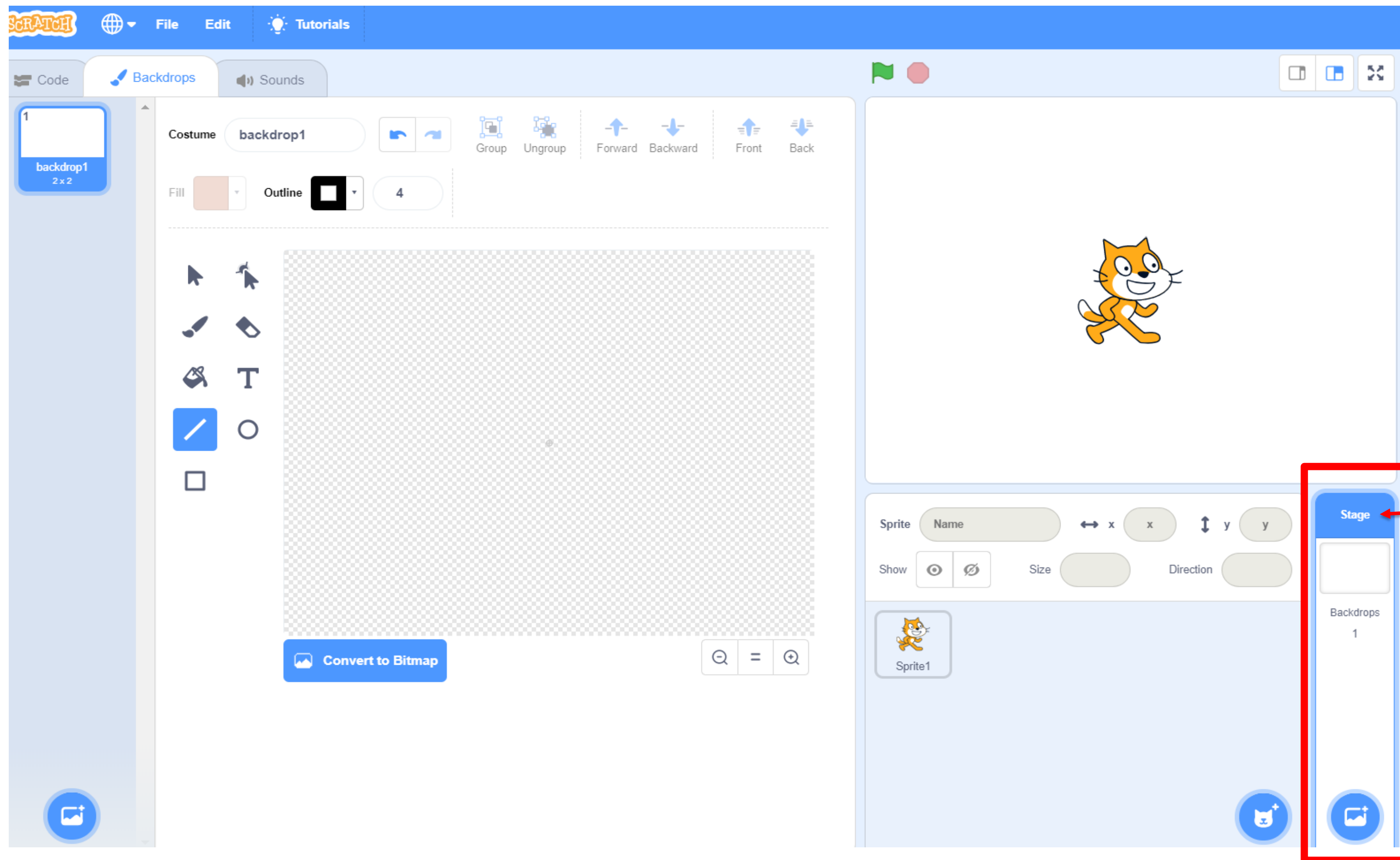


## How to delete a Sprite?

- Click on the Sprite that you would like to delete.
- The selected sprite will be indicated by a blue outline as seen below. Select the “X” to delete the sprite.



# ADD A BACKDROP

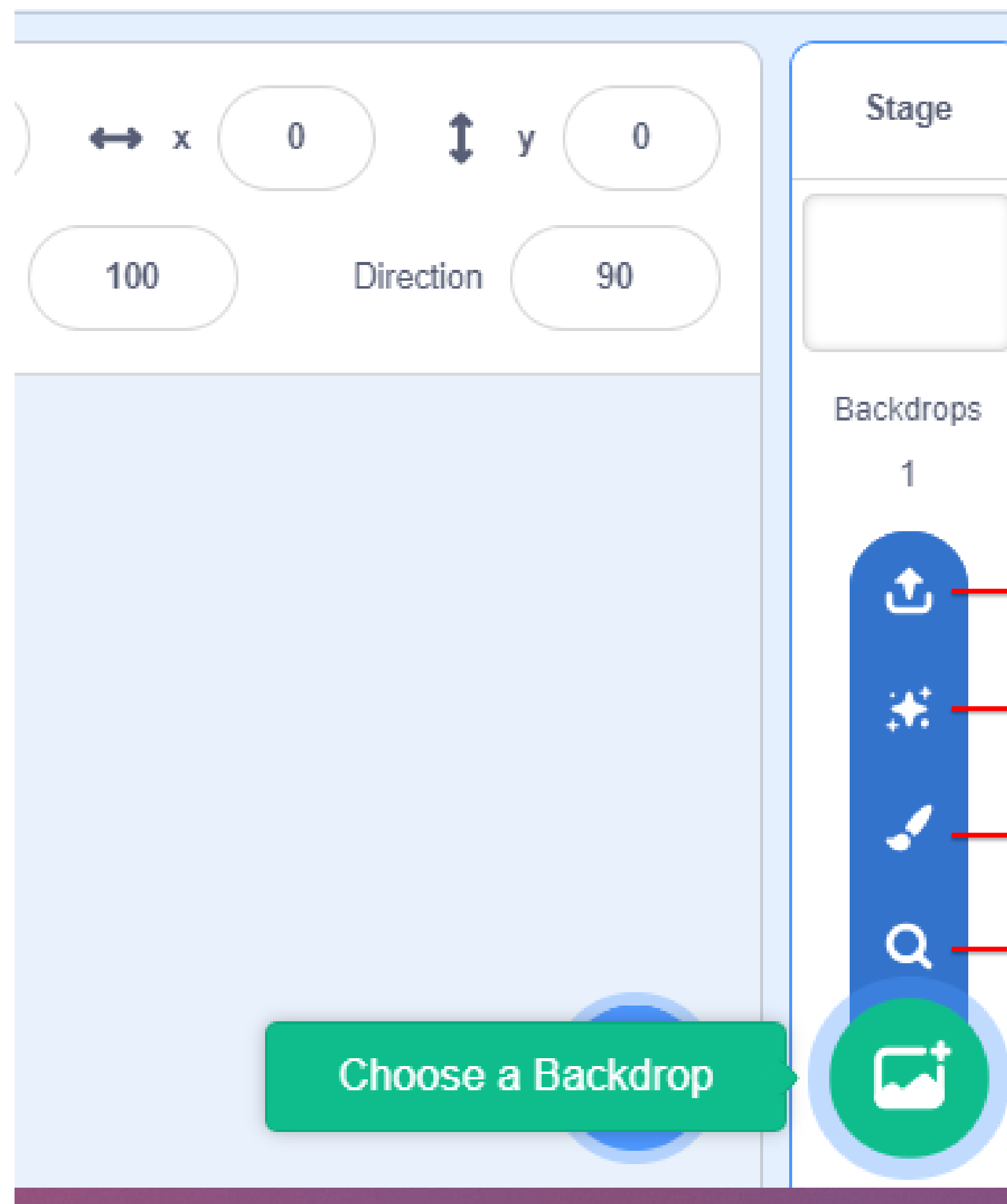


Click on 'Stage'



# ADD A BACKDROP – 4 WAYS

12



Note:

Adding a backdrop is the same as adding a new Sprite. There are again 4 ways of adding.

➤ Feel free to play around with the 4 methods stated below.

**Upload from file**

**Surprise / Random Backdrop**

**Paint a Backdrop**

**Choose a Backdrop from library**



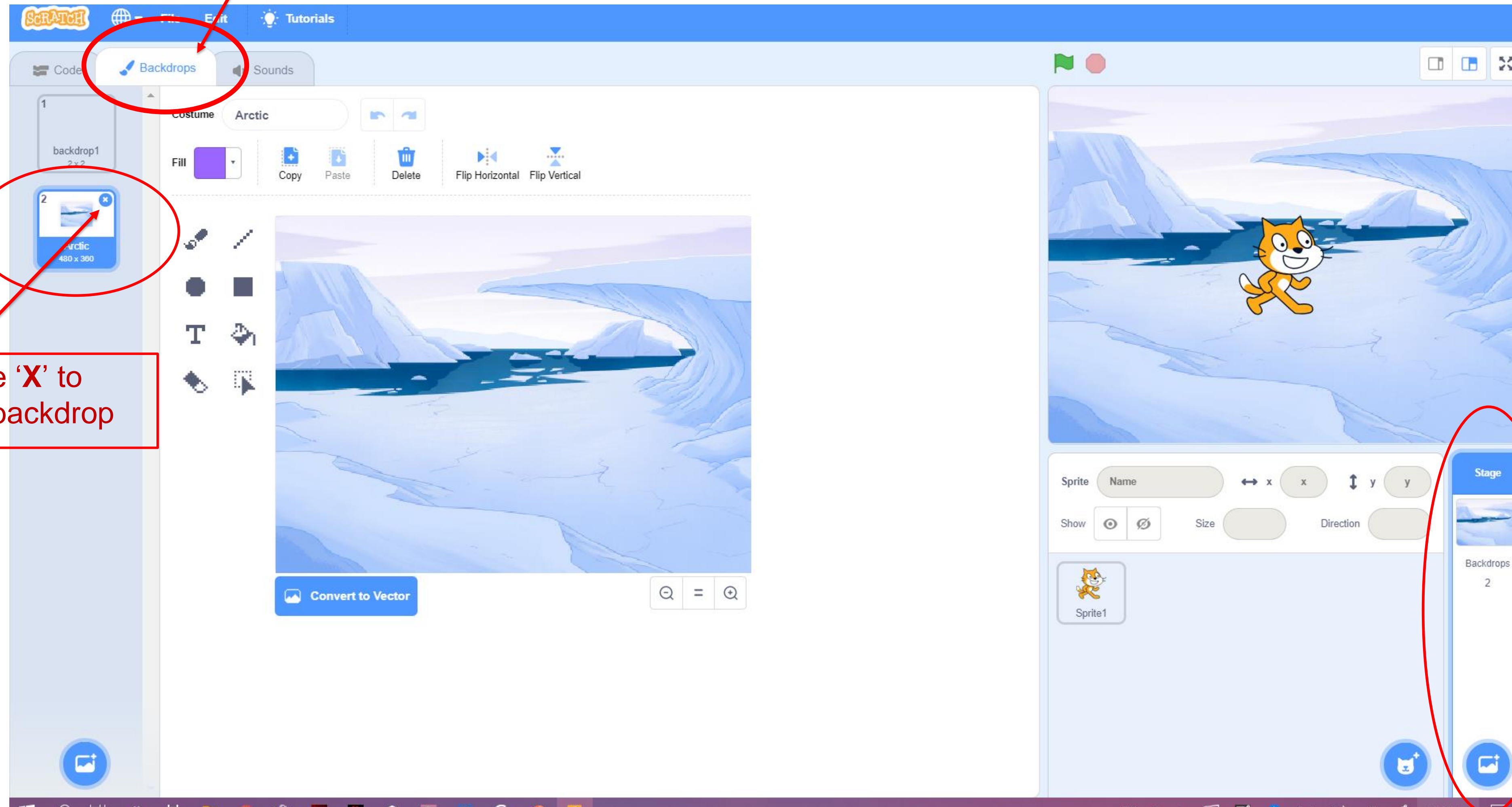


# DELETE A BACKDROP

2) Select 'Backdrops'

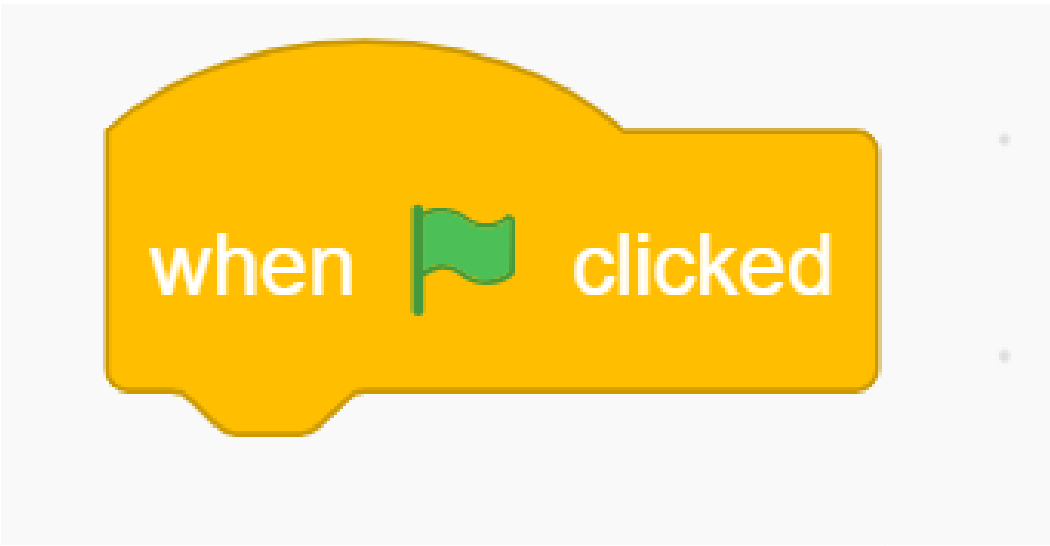
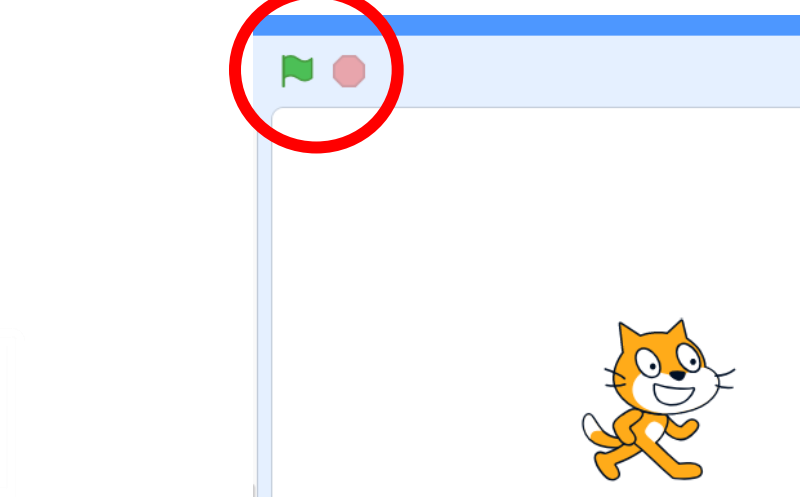
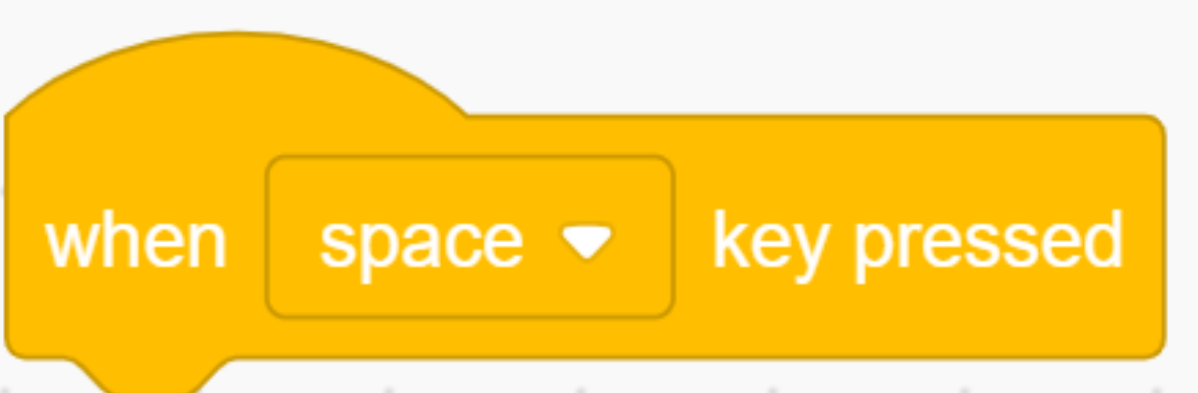
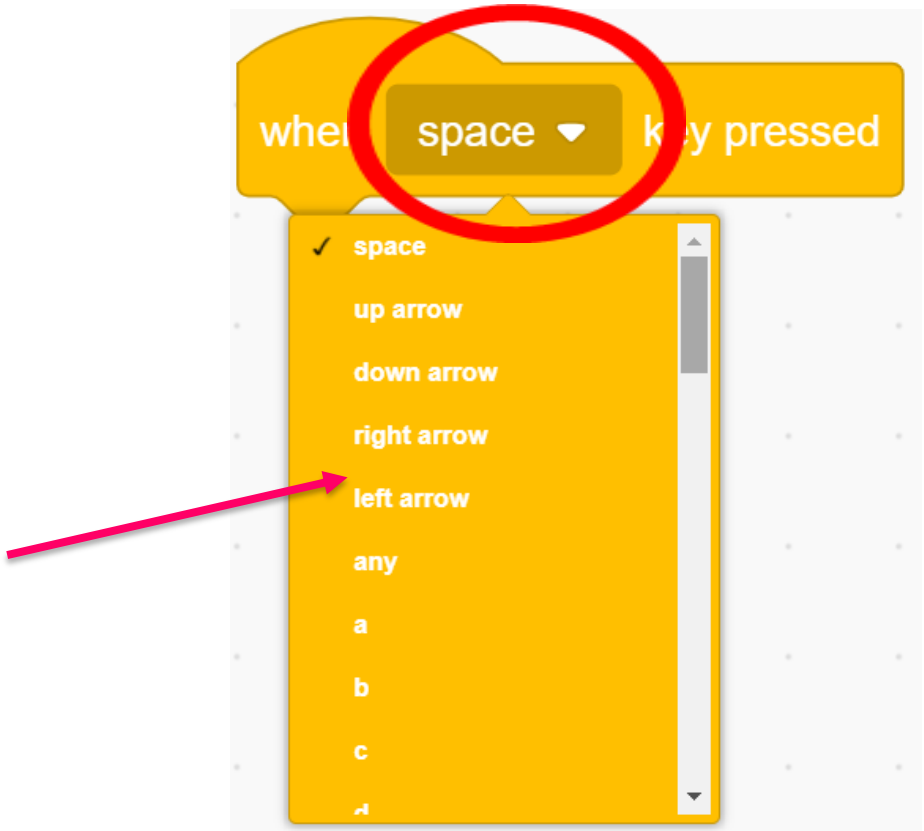
3) Click on the 'X' to delete the backdrop

1) Select the backdrop option in Stage.



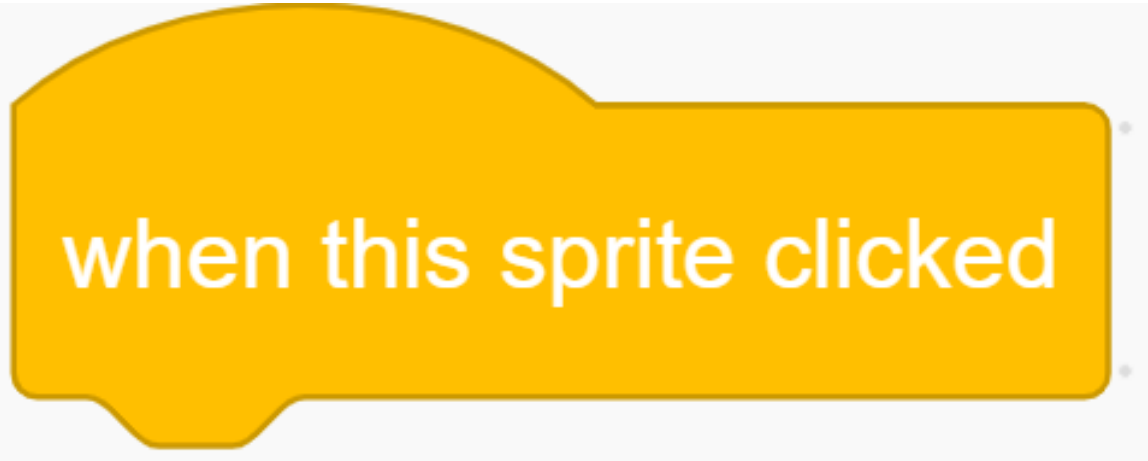
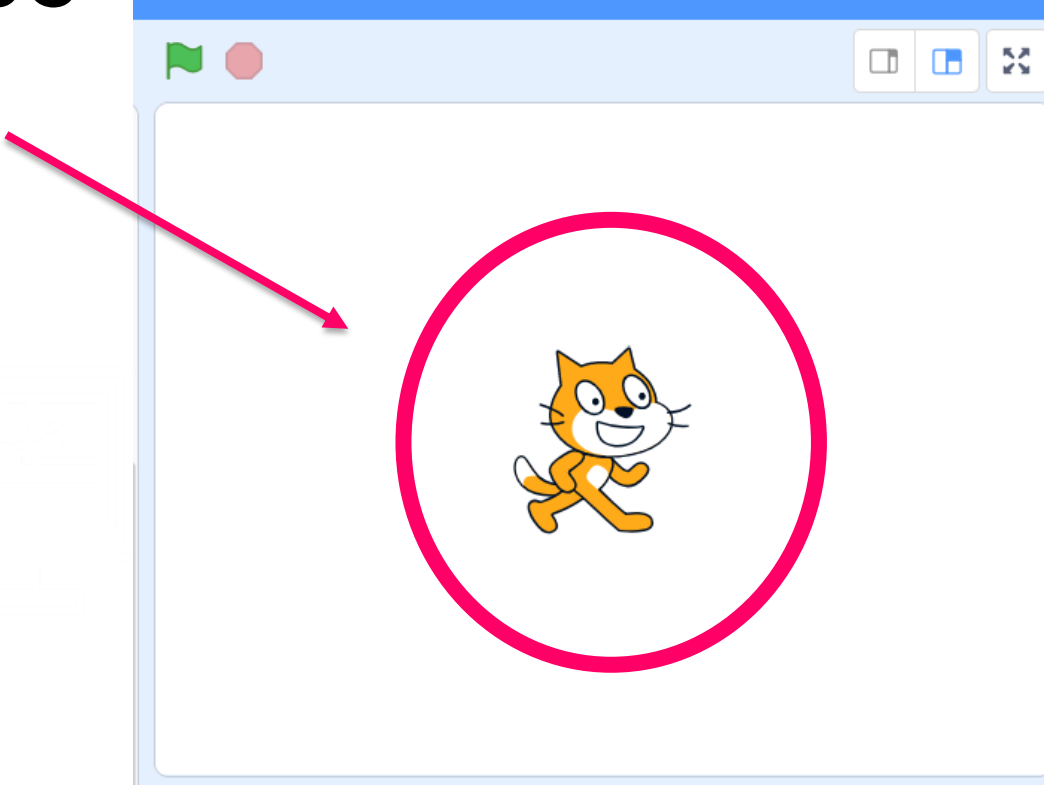
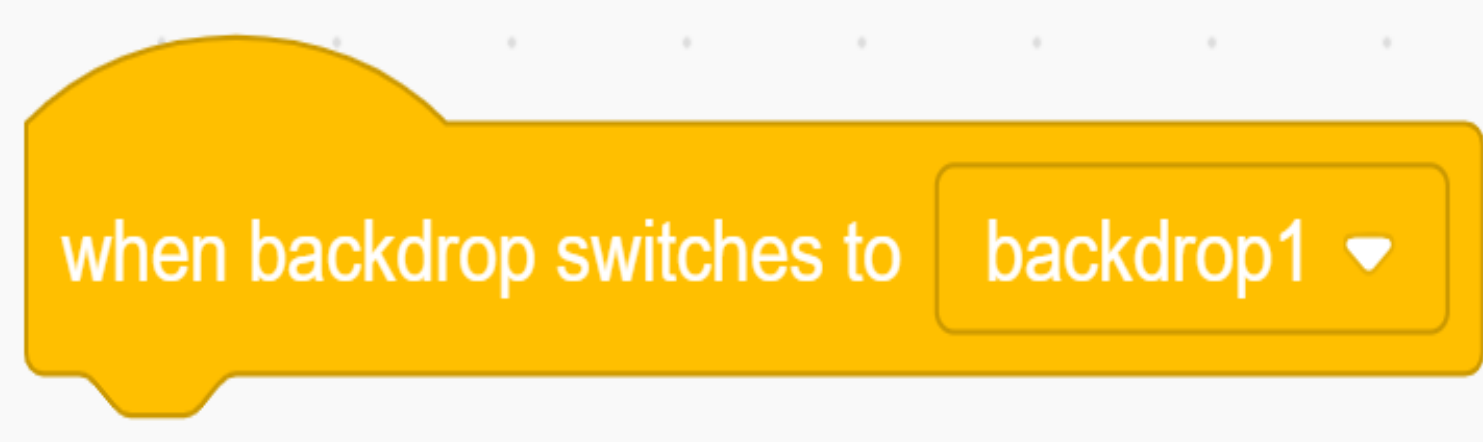
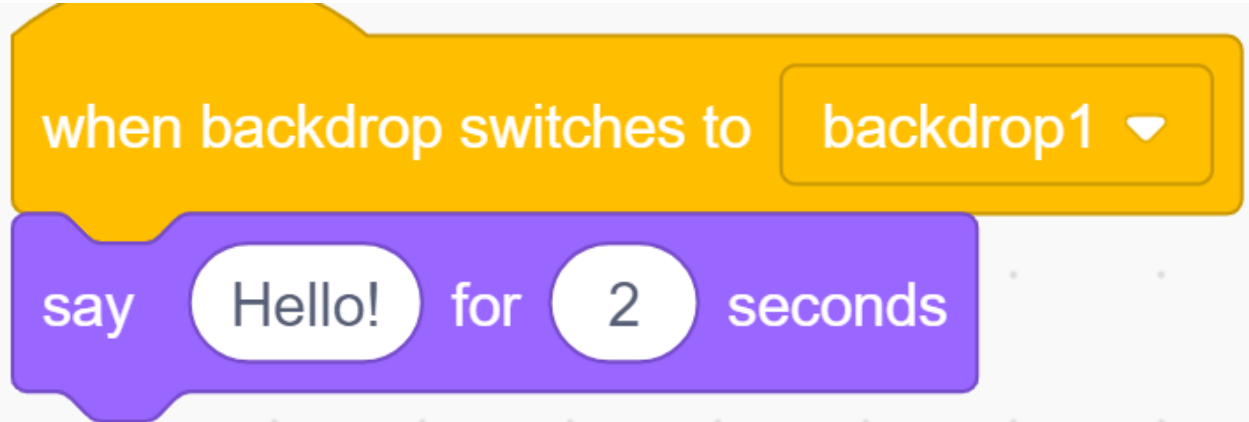


Events blocks are very important because they are needed to trigger the program. Without this block, programs will not run.

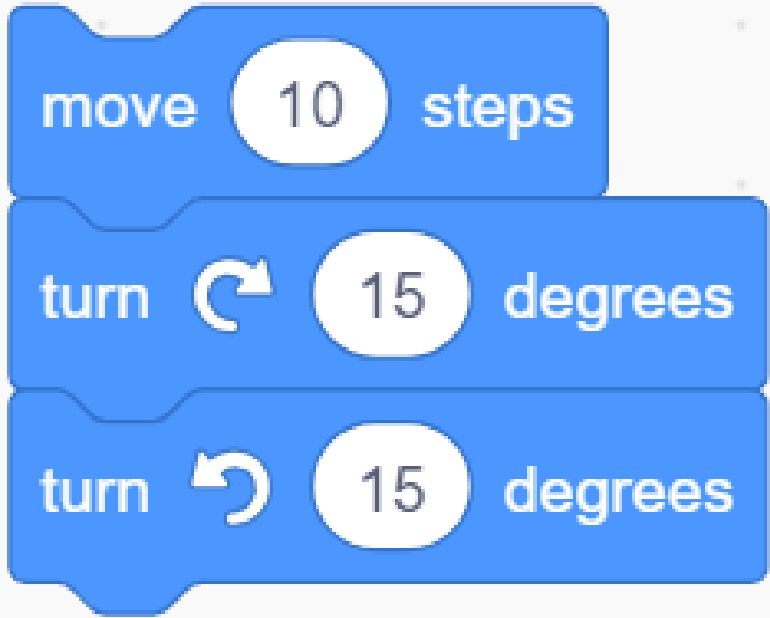

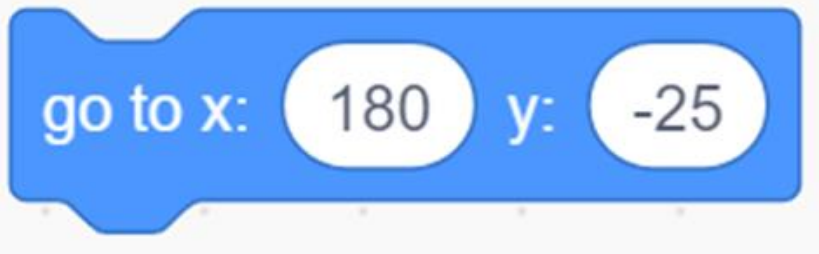
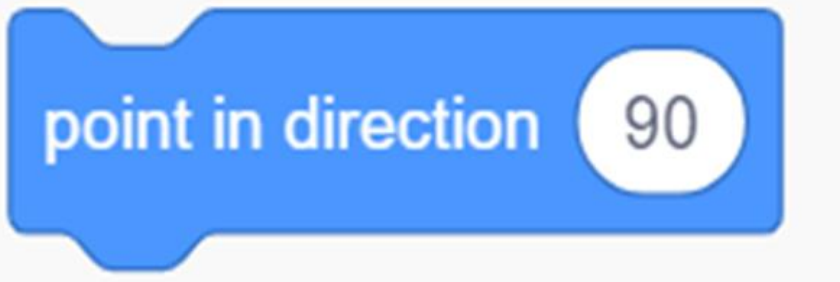
COMMANDS	DESCRIPTION
	<p>This block is very commonly used. Click on the 'green flag' above the stage to start/trigger the program.</p> <p>Click on the 'red circle' to stop the program.</p> 
	<p>Program is triggered by tapping on the 'spacebar' on the keyboard.</p> <p>Other keys are also available for selection. Select the down arrow beside 'space' and a list of the other keys will appear.</p> 



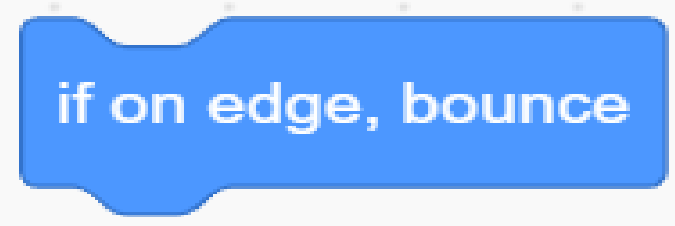
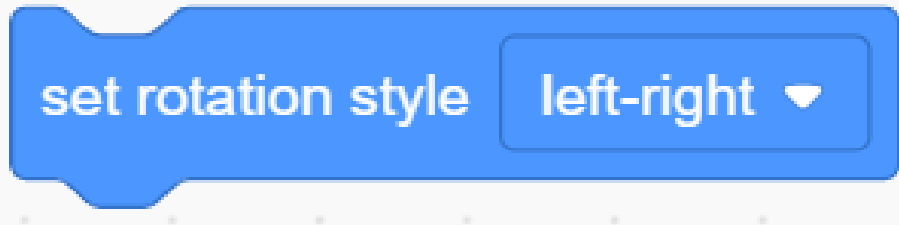

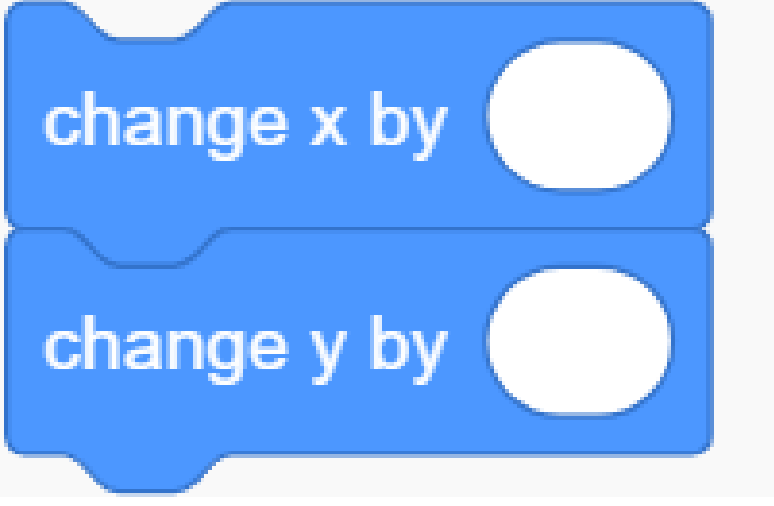
Events blocks are very important because they are needed to trigger the program. Without this block, programs will not run.

COMMANDS	DESCRIPTION
	<p>Click on the Sprite present in the stage to trigger the program.</p> 
	<p>Program is triggered upon a change in backdrop.</p> <p>*Note for this to work, minimum 2 backdrops are required.</p> 




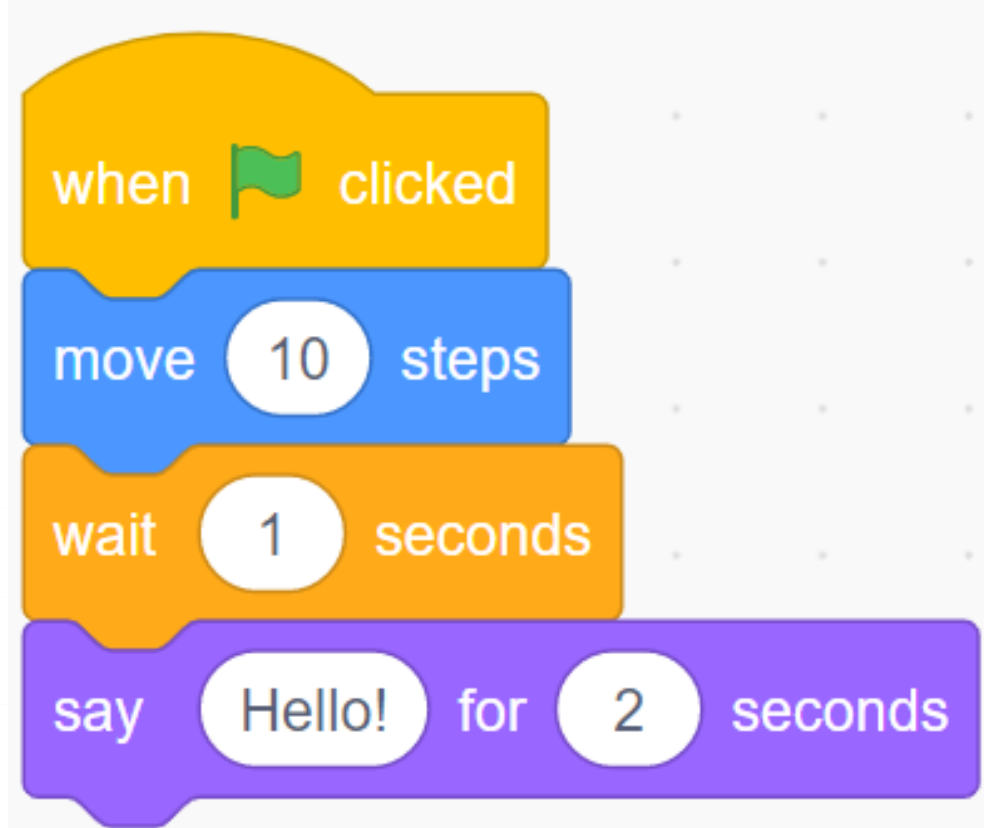
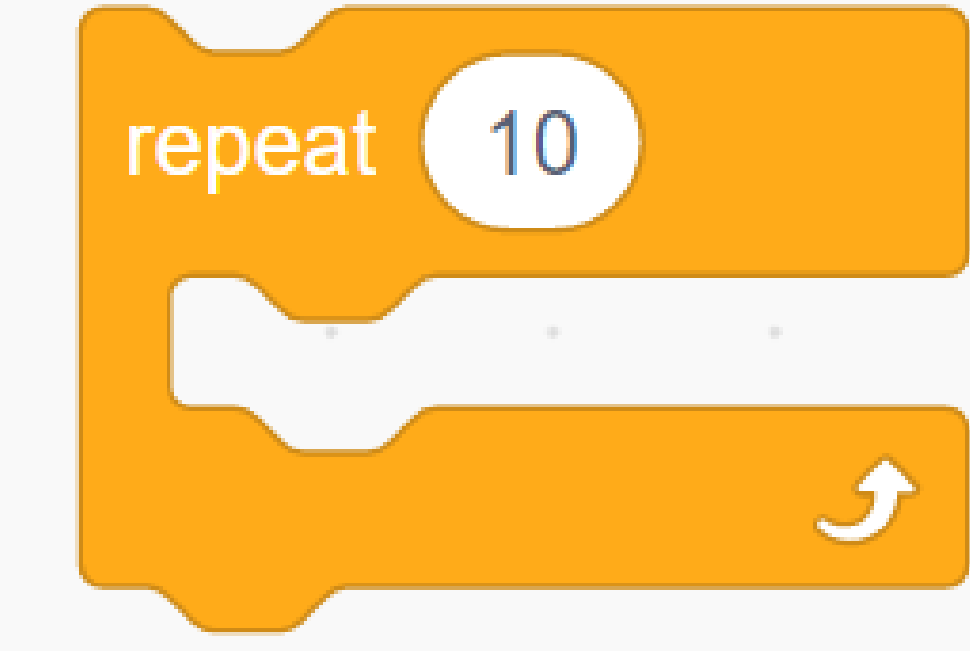
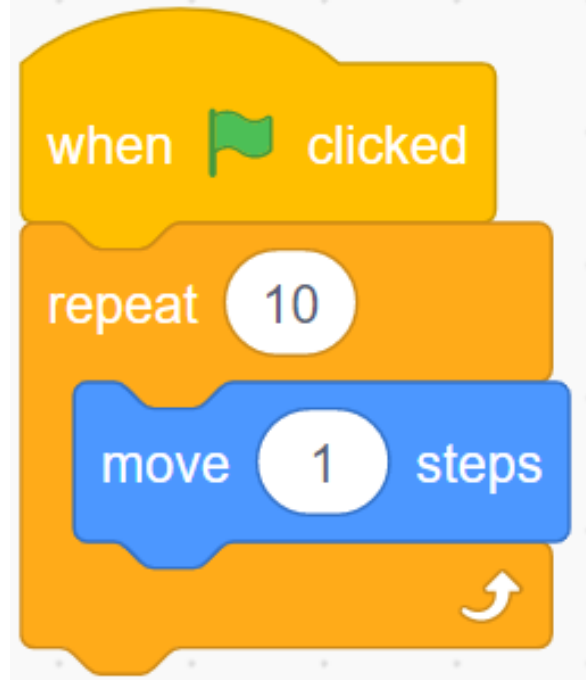
COMMANDS	DESCRIPTION
	Programs the Sprite to move
	Sprite will move to the centre of the stage
	Sprite will move to a specified coordinate
	Setting of a Sprites bearing




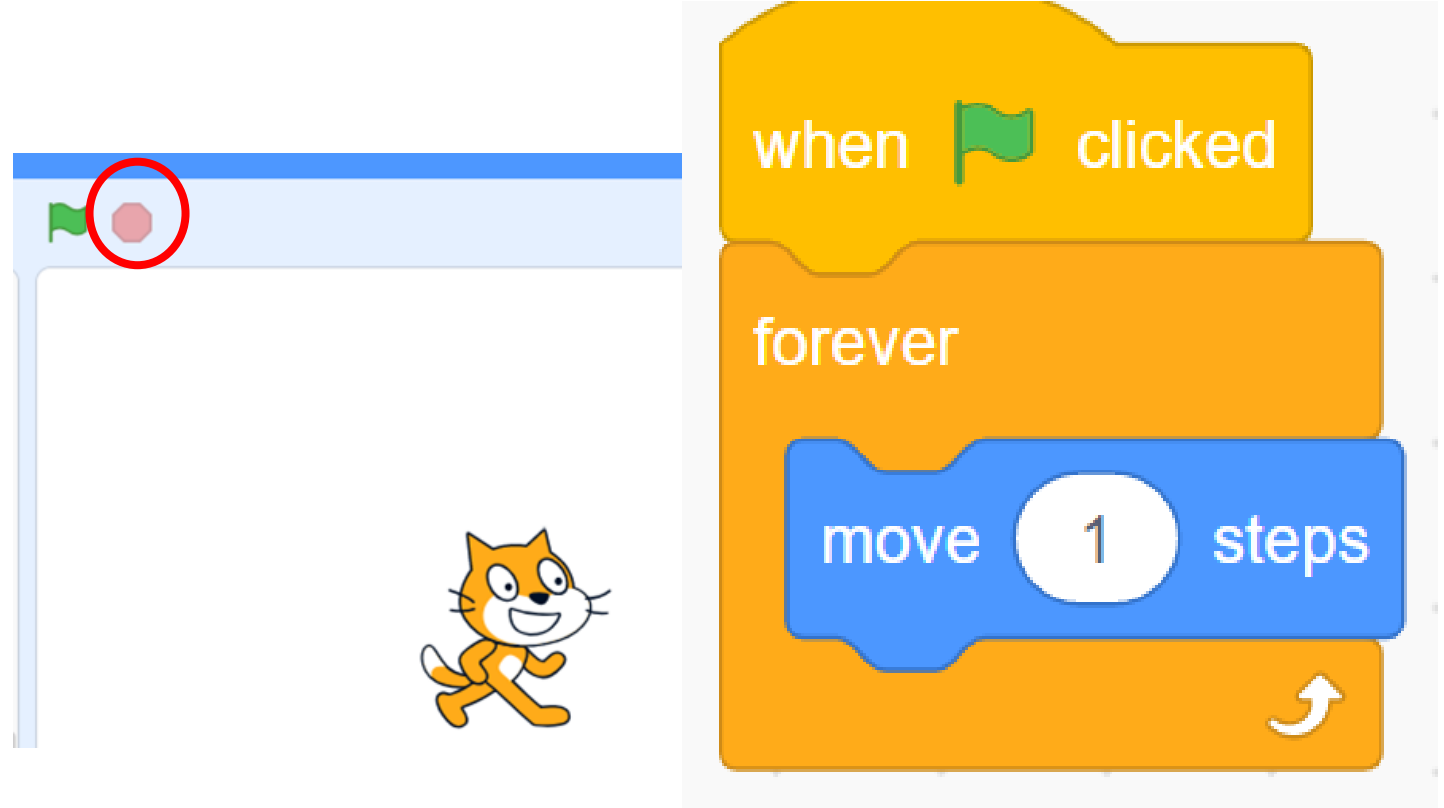
COMMANDS	DESCRIPTION
	Sprite will bounce upon touching the edges of the stage. Prevents a sprite from leaving the stage.
	Setting of the Sprite's rotation style
	<p><b>Set x</b> places a Sprite along the 'X' axis (Horizontal/Left &amp; Right)</p> <p><b>Set y</b> places a Sprite along the 'Y' axis (Vertical/Up &amp; Down)</p>
	<p>Change x: A <b>positive</b> number shifts the sprite to the <b>right</b> A <b>negative</b> number shifts the sprite to the <b>left</b></p> <p>Change y: A <b>positive</b> number moves the sprite <b>up</b> A <b>negative</b> number moves the sprite <b>down</b></p>





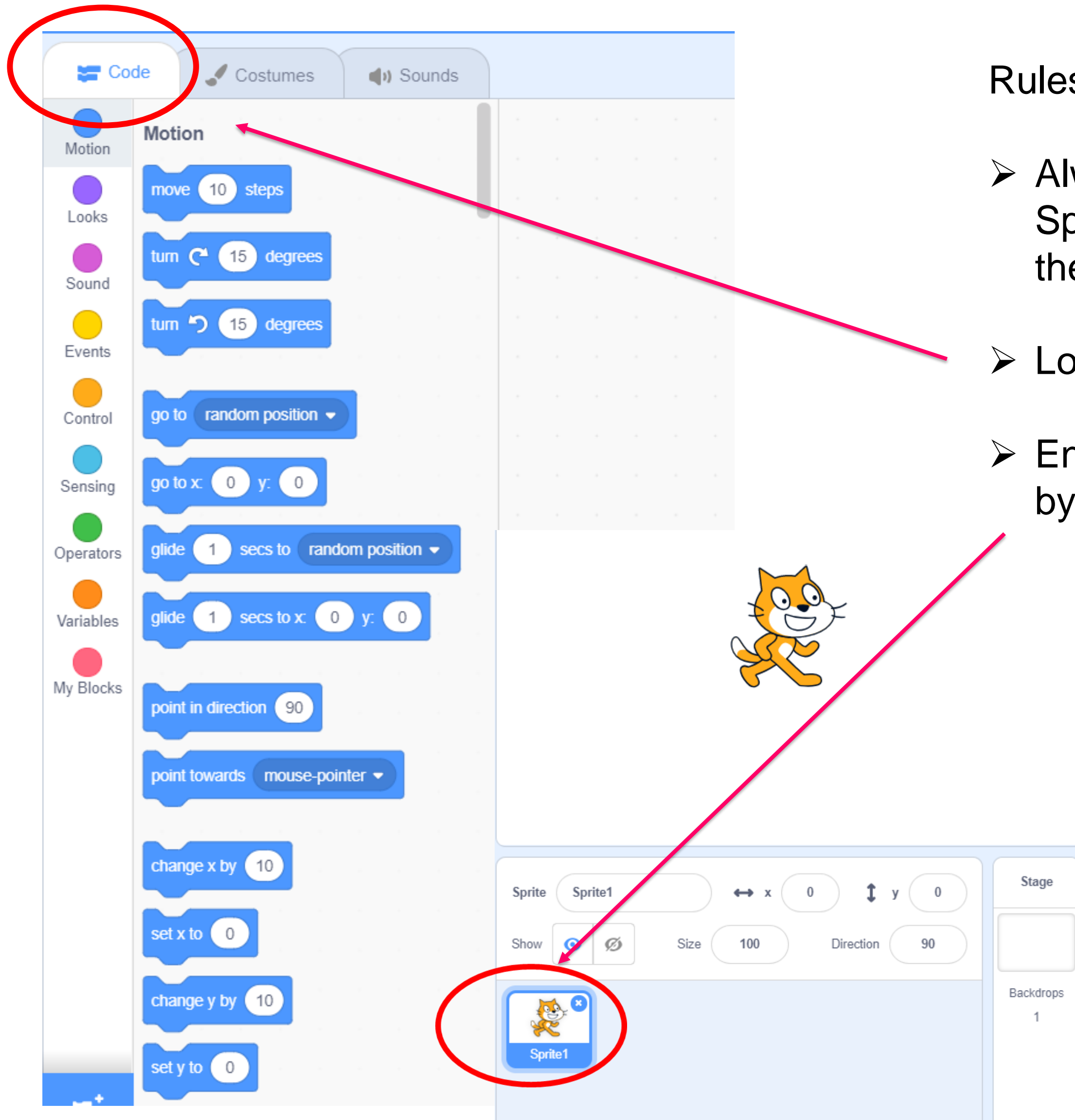
COMMANDS	DESCRIPTION
	<p>This block tells the Sprite to wait 1 second before doing the next action. You can increase or decrease the timing to your preference.</p> <p>E.g. Sprite will move 10 steps, wait 1 second before the Sprite says 'Hello!' for 2 seconds.</p> <p>Note: Wait blocks are important because they provide sequencing to a program</p> 
	<p>Specific actions repeated a set number of times.</p> <p>E.g. Upon trigger, the Sprite will move 1 step 10 times.</p> 



COMMANDS	DESCRIPTION
	<p>Forever loops are designed to repeat a program an infinite number of times. The program will only stop when the 'stop' button is selected.</p> <p>E.g. In the program shown, our sprite will move 1 step forever until the 'stop' button has been selected.</p> 



# LESSON 1: BASIC MOVEMENTS



## Rules before coding

- Always be clear, which program belongs to which Sprite. Every Sprite has a purpose. Always program the right set of codes into the appropriate Sprite.
- Look for the program blocks by selecting the tab 'Code'
- Ensure that the appropriate Sprite has been selected, indicated by a blue outline as shown below.



# LESSON 1: BASIC MOVEMENTS


## Try this Program:

➤ The Sprite will move 10 steps when the green flag is clicked.

1) Go to  and drag  to the script area.

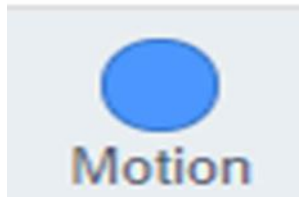
2) Go to  and drag  to the script area

---

Try adding  to the code. Run the program and see what happens.

---

The Sprite will move out of the screen. We will use the block below to prevent the Sprite from leaving the stage.

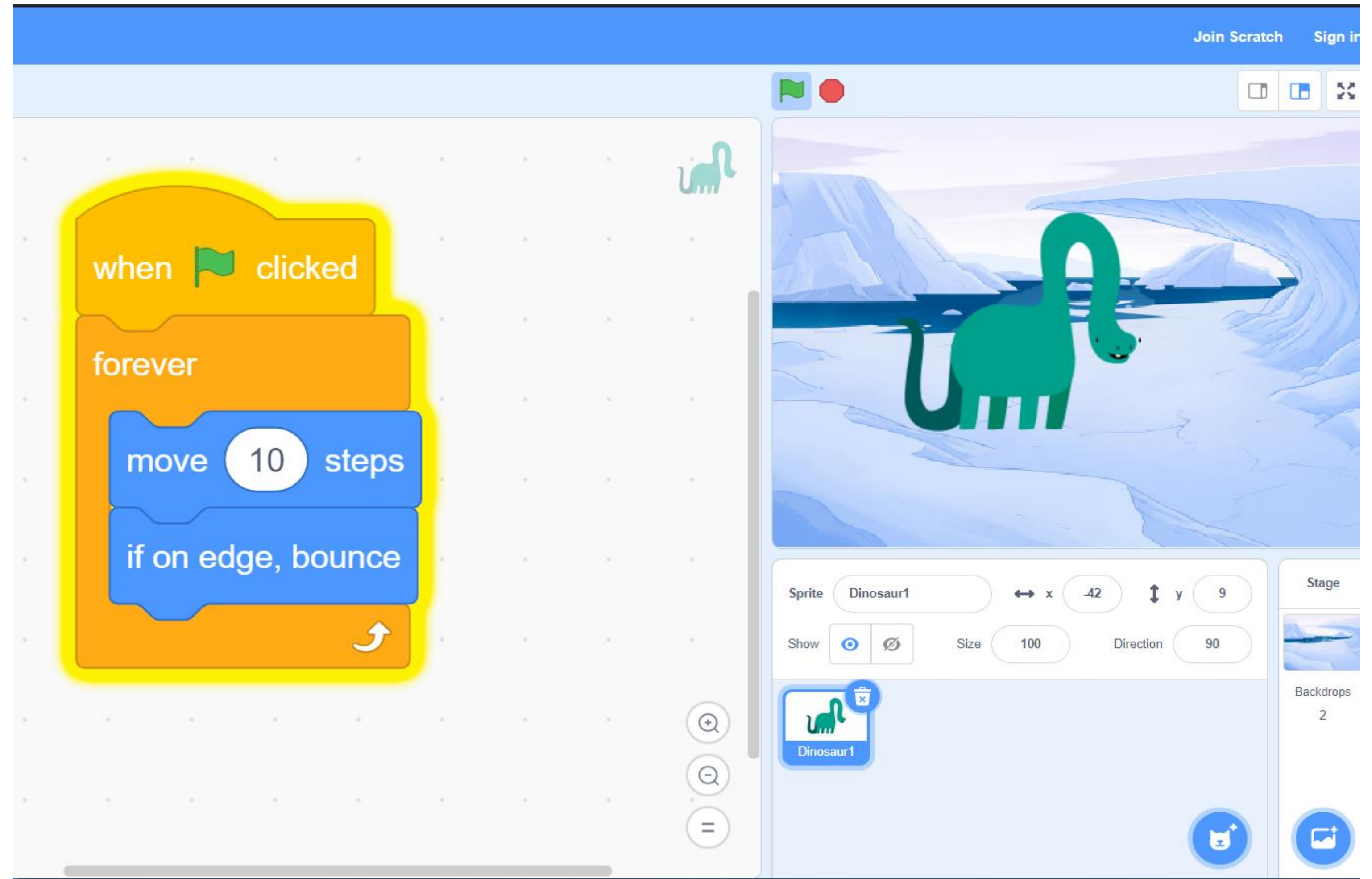
➤ Go to  and drag  to your codes.





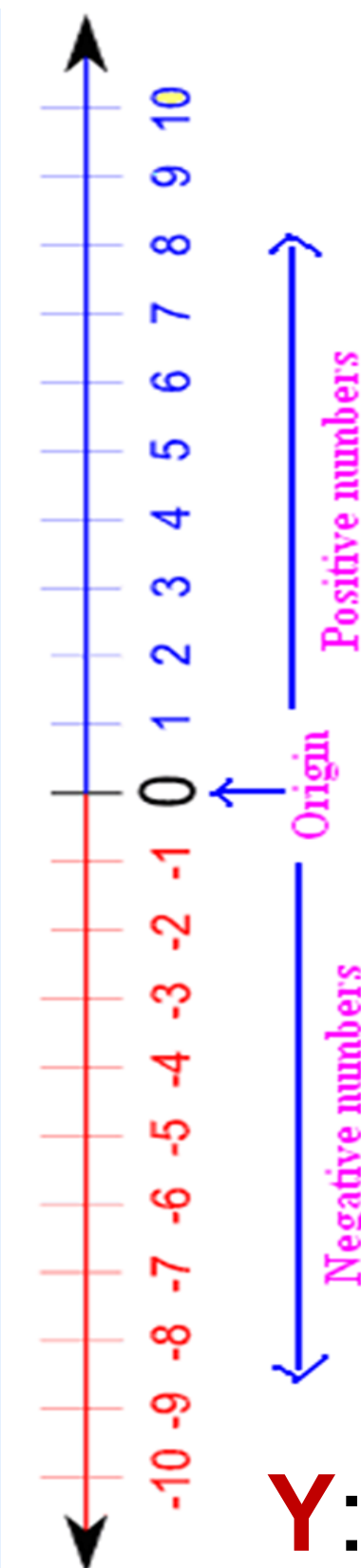
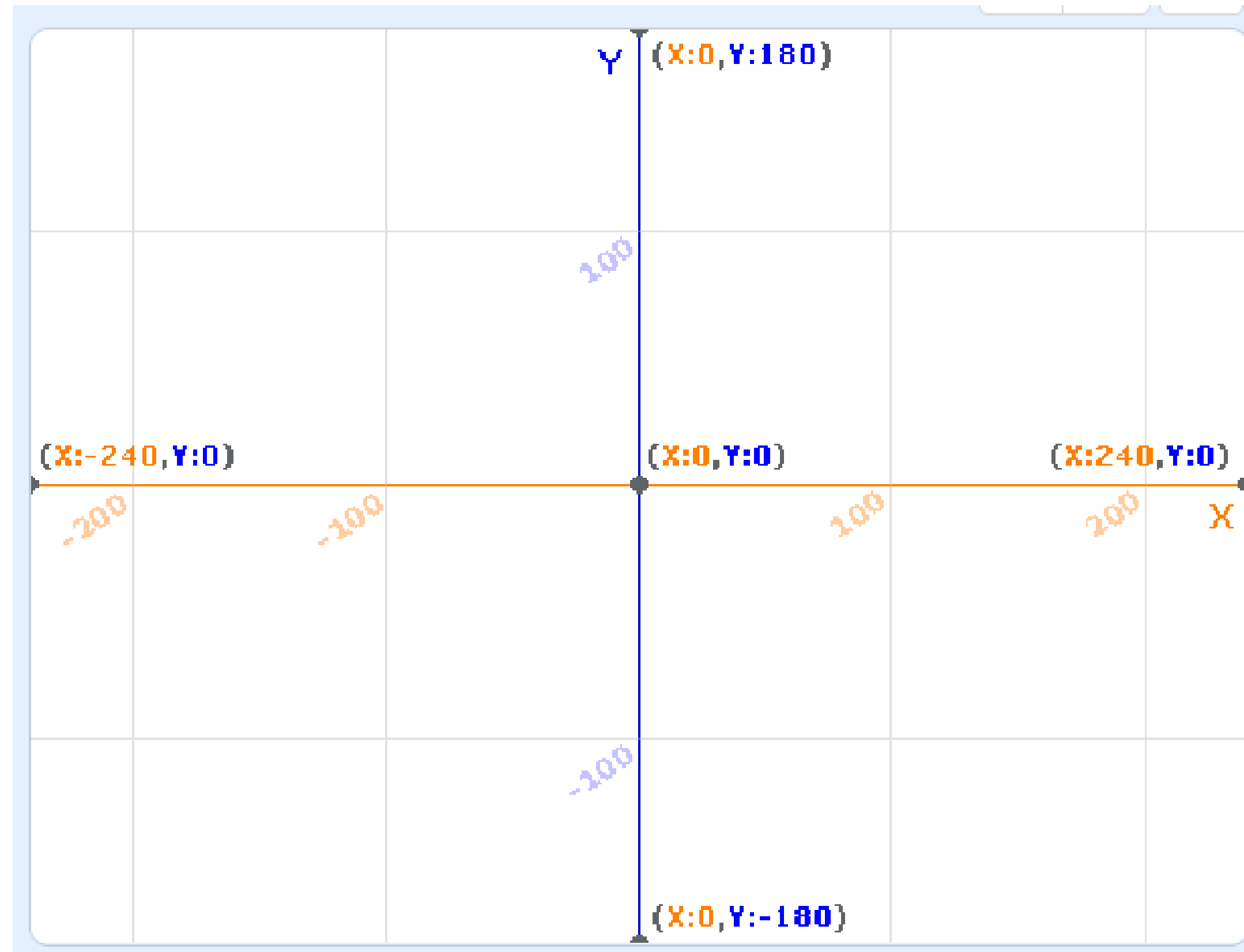
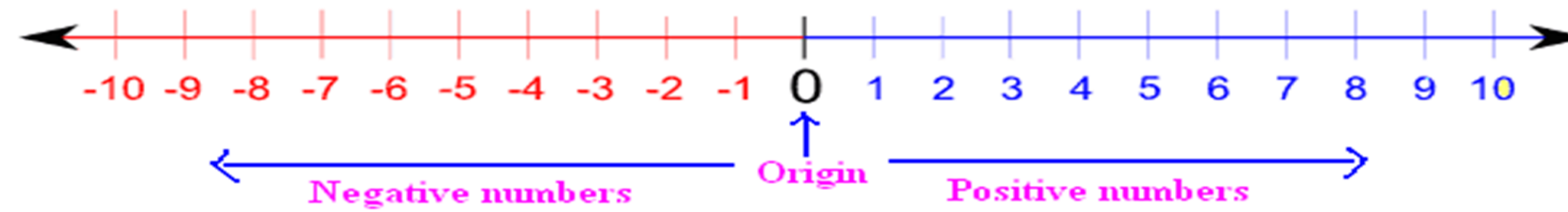
# LESSON 1: BASIC MOVEMENTS

Did you get this?



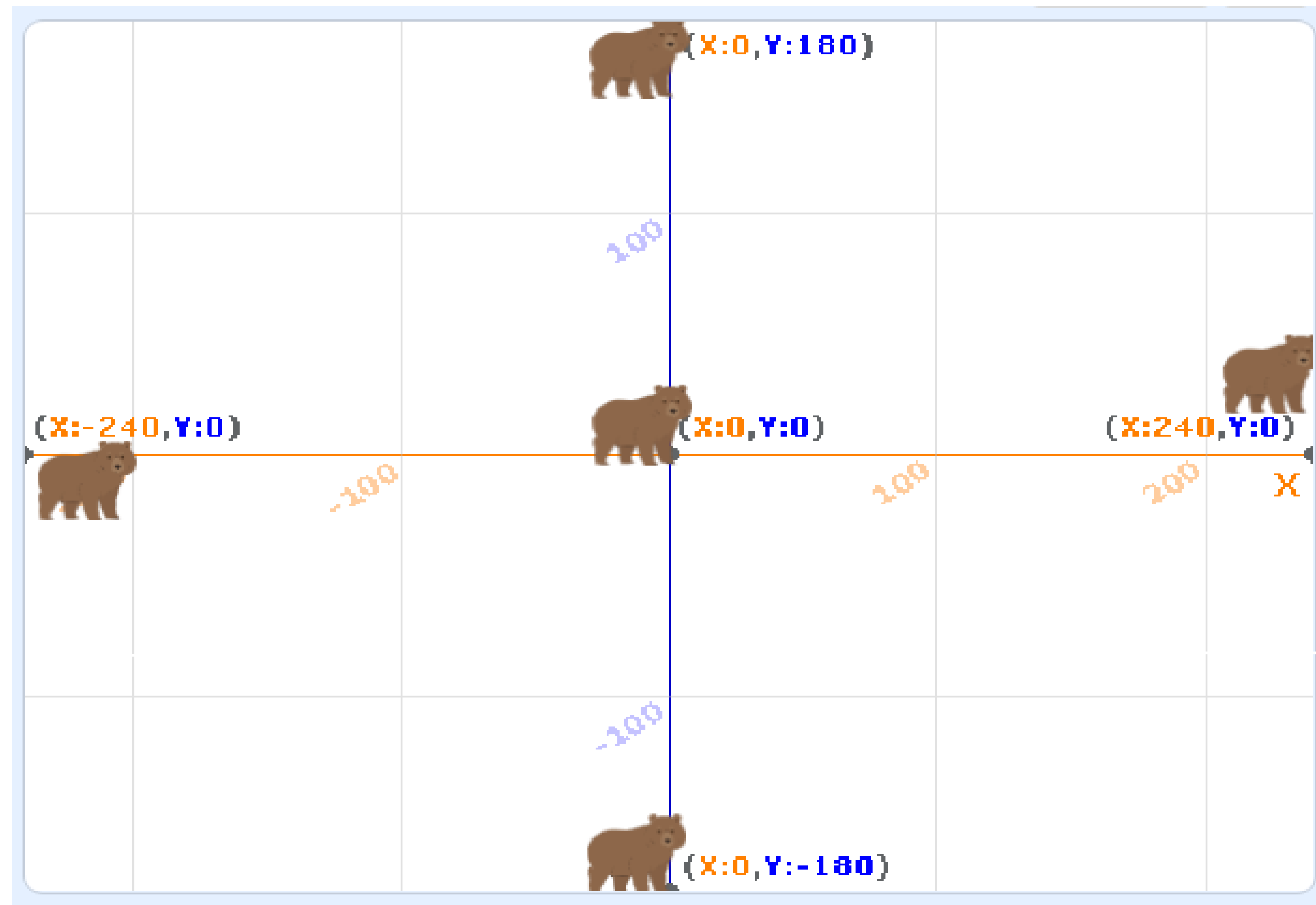
# LESSON 1: X & Y Principles

**X:** moves **left (-)** or **right (+)**

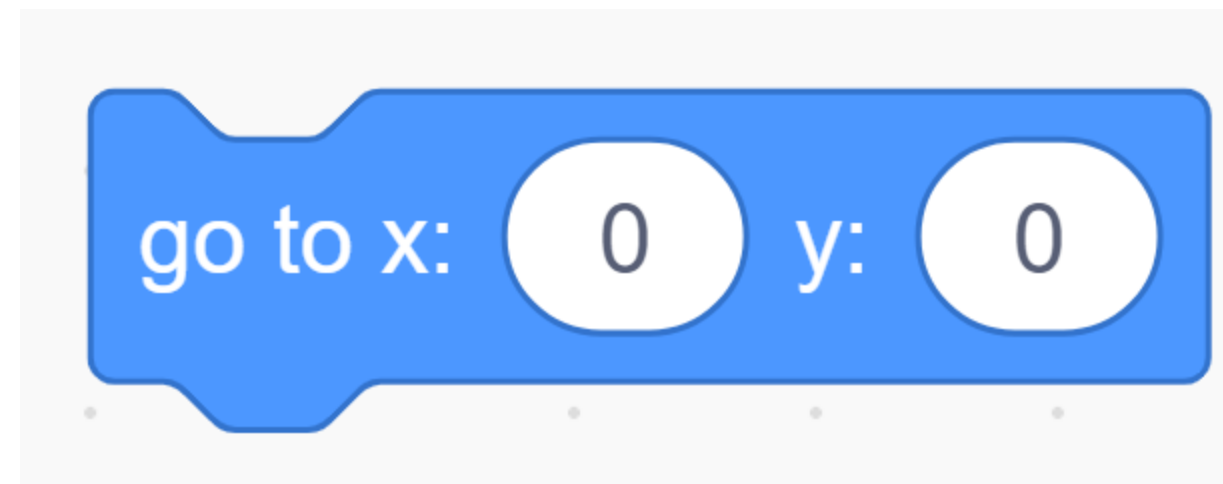


**Y:** moves **up (+)** or **down (-)**

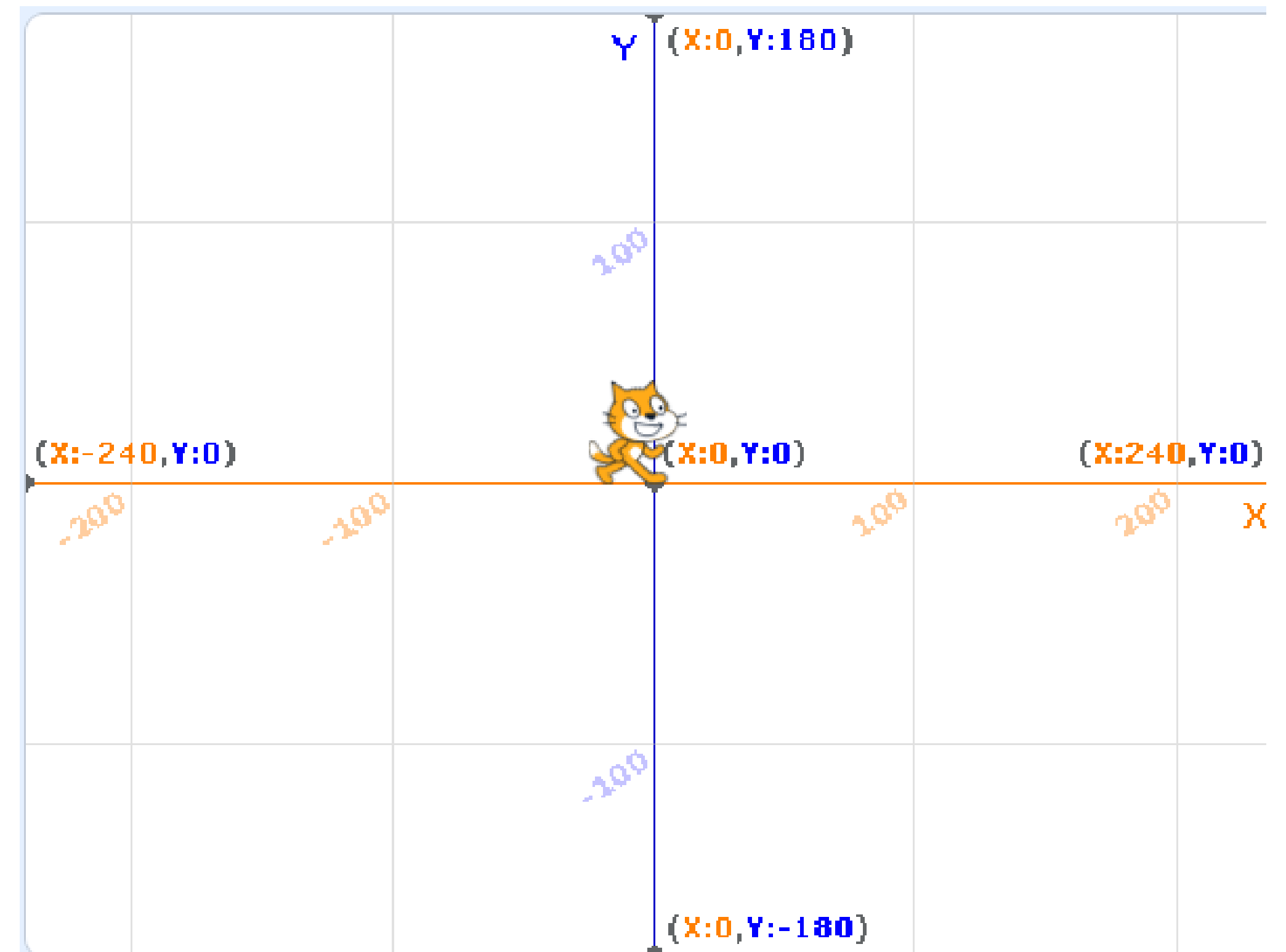
# LESSON 1: X & Y Principles



# LESSON 1: MOTION – ‘GO TO’ BLOCK



- The **‘go to’ block** tells a Sprite to jump to any location on the stage.
- This program is widely used in setting a sprite to a desired location at the start of a program.





# LESSON 1: MOTION – ‘GO TO’ BLOCK

when clicked

go to x: -184 y: -67

As you drag the bear around the stage, the coordinates reflected on the left side of the screen will correspond to it's exact location.

You will thus be able to tell which coordinate the bear is at by checking the highlighted region and programming the coordinates accordingly as such.

Sprite: Bear

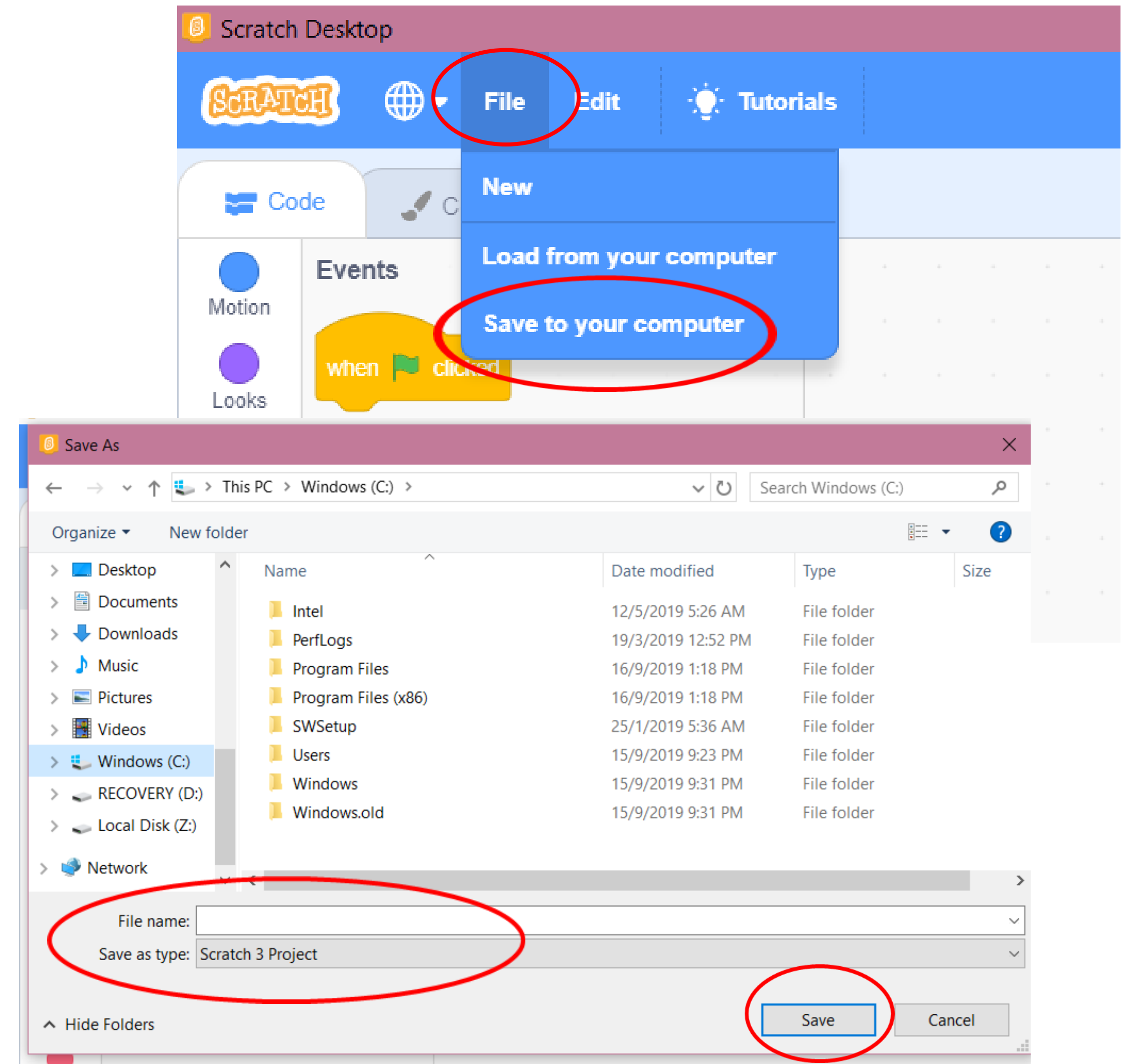
x: -184 y: -67

Size: 50 Direction: 90

# SAVING A PROJECT

Dear Parent, please follow the following to save your child's work:

- 1) Click on '**File**' at the top left-hand corner
- 2) Click '**Save to your computer**'
- 3) Look for '(D:)' or any other drive or location where you want to save the file
- 4) Under File name 'key in (your desired project name)
- 5) Click on '**Save**'
- 6) After you have saved the project, click 'x' at the top right-hand corner of Scratch to close it.




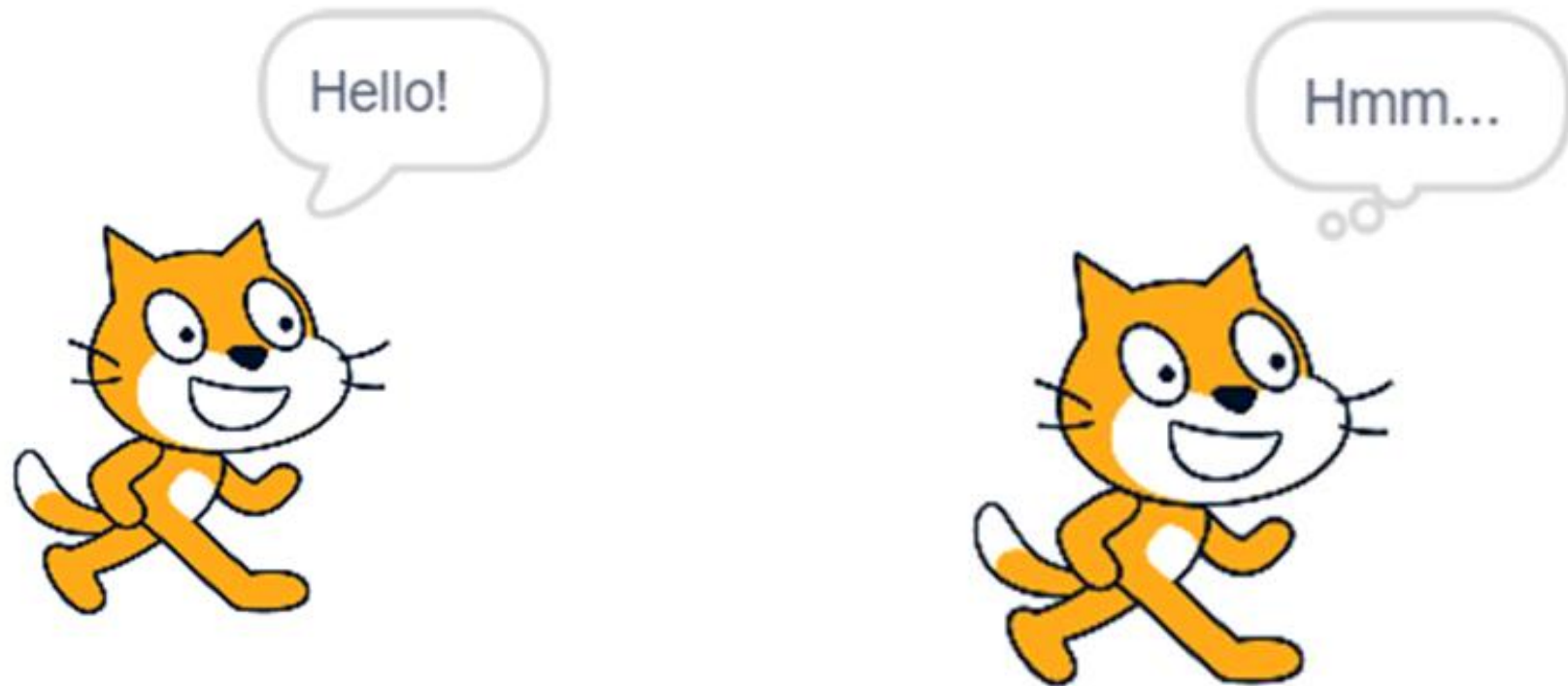
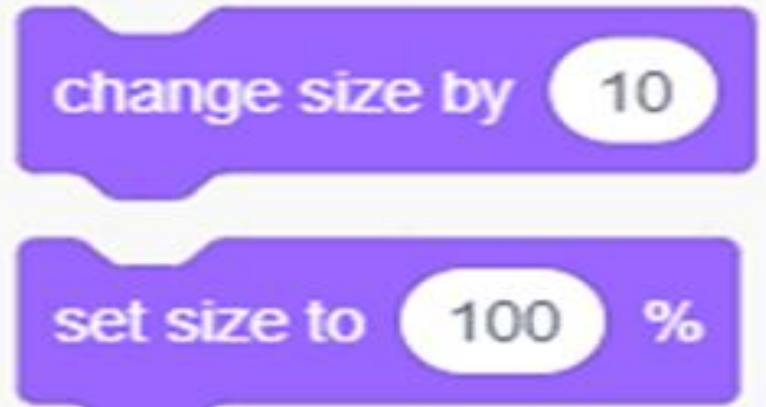
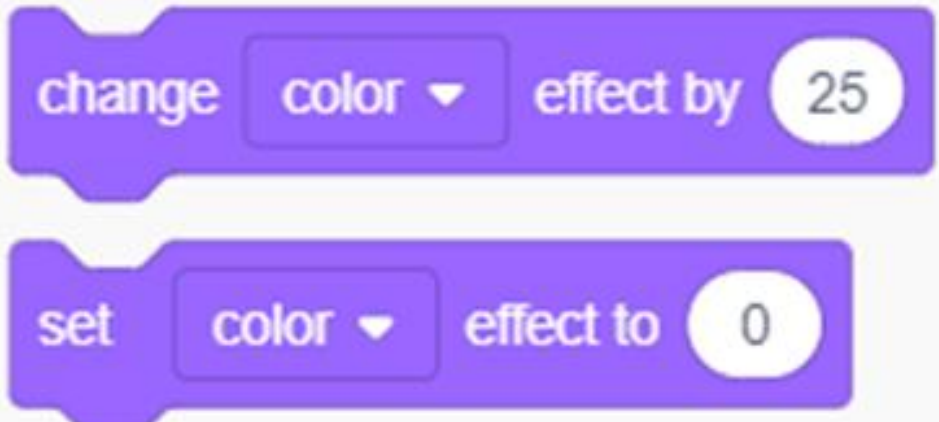
# LESSON 1: RECAP

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What we have learned so far:

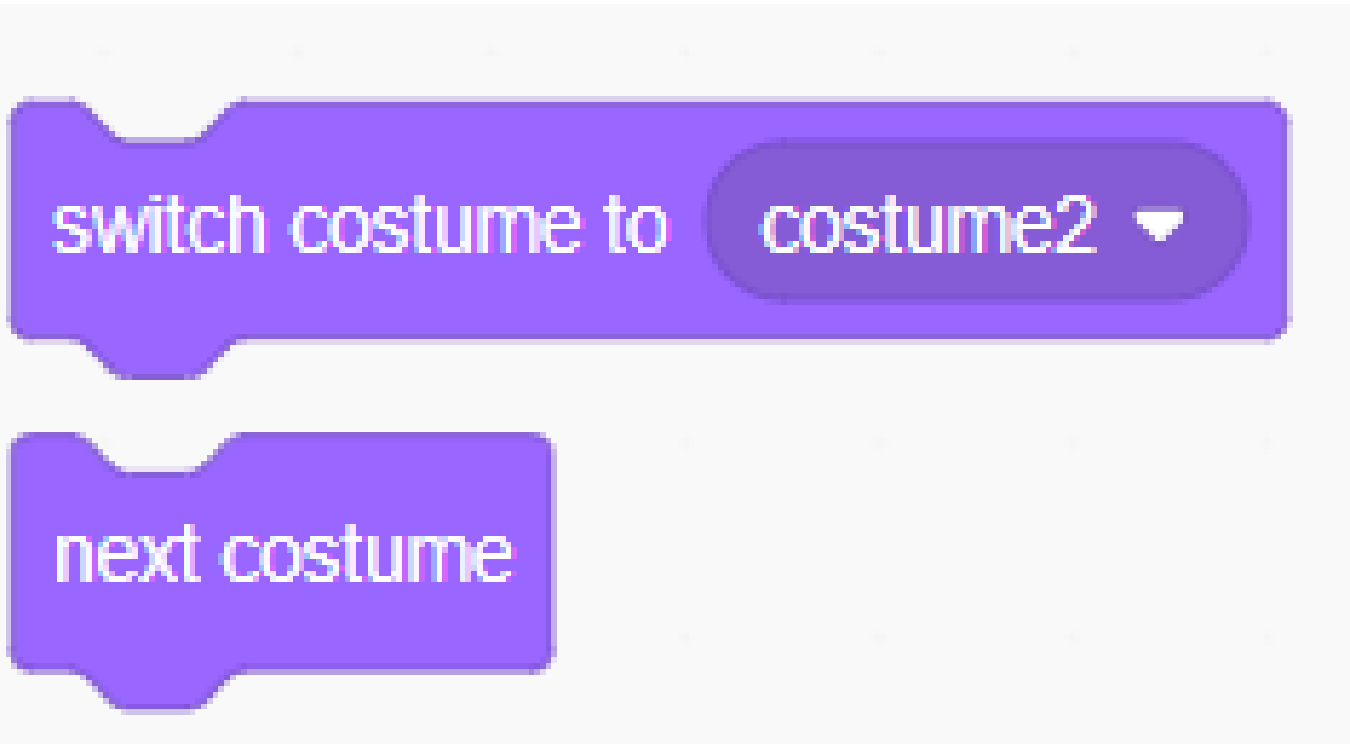
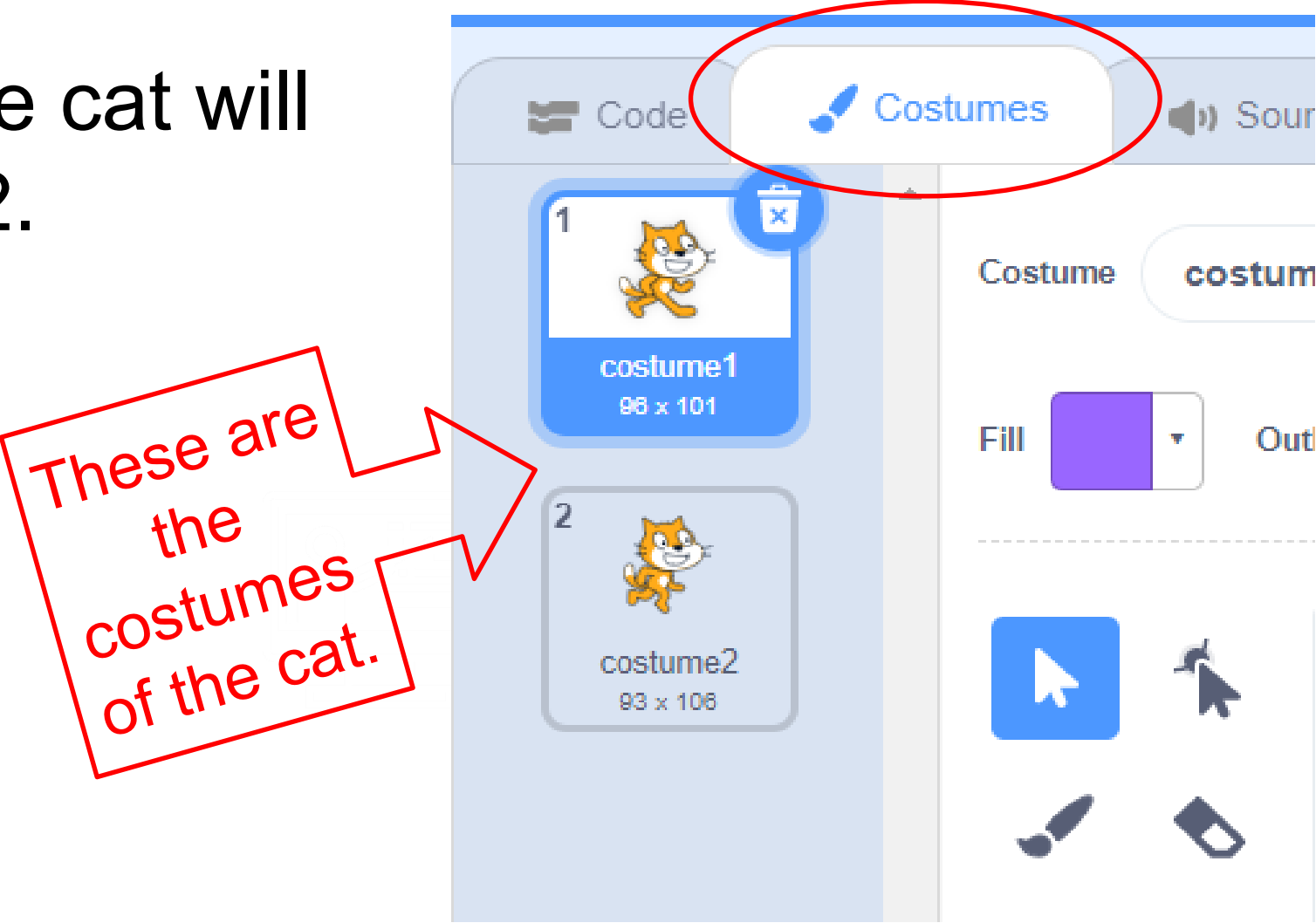
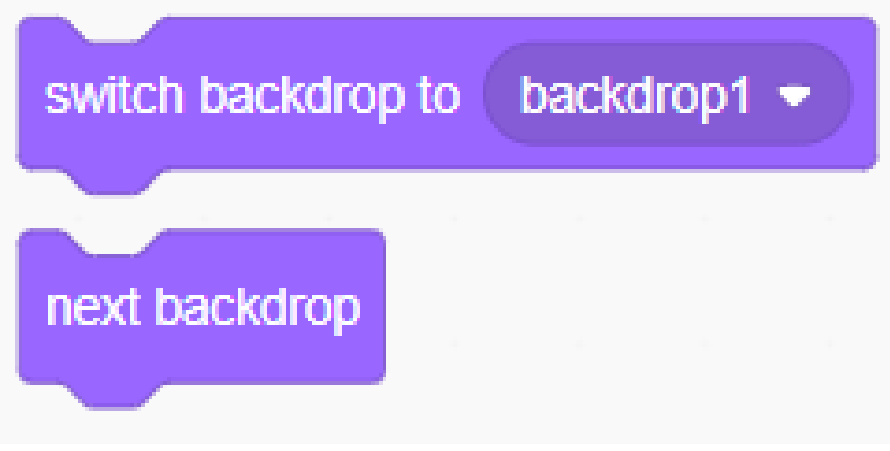
- ✓ What is Scratch?
- ✓ How to add and delete Sprites and backdrops
- ✓ What are some of the basic movements
- ✓ How to start a program or how to run a code
- ✓ What is X&Y principles



COMMANDS	DESCRIPTION / ILLUSTRATION
 <p>say Hello! for 2 seconds</p> <p>say Hello!</p> <p>think Hmm... for 2 seconds</p> <p>think Hmm...</p>	
 <p>change size by 10</p> <p>set size to 100 %</p>	<p>Changes the size of the Sprite</p> <p>Sets a Sprite size to the specified % of the original size</p> <p>Size 100%: Original size of the Sprite</p>
 <p>change color effect by 25</p> <p>set color effect to 0</p>	<p>To change or set the color effect of the Sprite</p> <p>Color effect 0: Original color</p>





COMMANDS	DESCRIPTION / ILLUSTRATION
	<p>In order to do animations, a Sprite must have 2 or more costumes.</p> <p>By using the 'next costume' block, the cat will change from costume 1 to costume 2.</p> 
	<p>You can have 2 or more backdrops. Use either of these 2 blocks to switch to a desired backdrop.</p> <p>(If your child is unable to locate the “switch backdrop” function, Remember to ensure that the backdrop option is selected properly.)</p>



## Are They The Same?

### Sprites



### Costumes



# LESSON 2: SPRITE VS COSTUMES

## Are They The Same?

- Costumes are a Sprites alternate appearance.
- Sprites can change their look to any of its costumes. costumes can be named, edited, created, and deleted. Every sprite must have at least one costume.
- Costumes are widely used in the creation of animation and games for aesthetic purposes.



**Sprite**

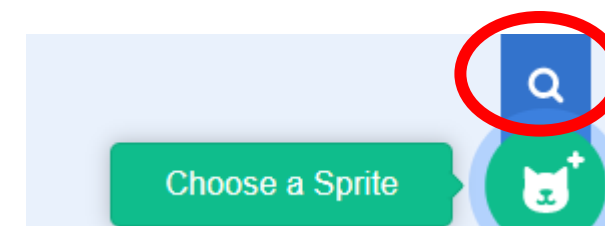


**Costumes**



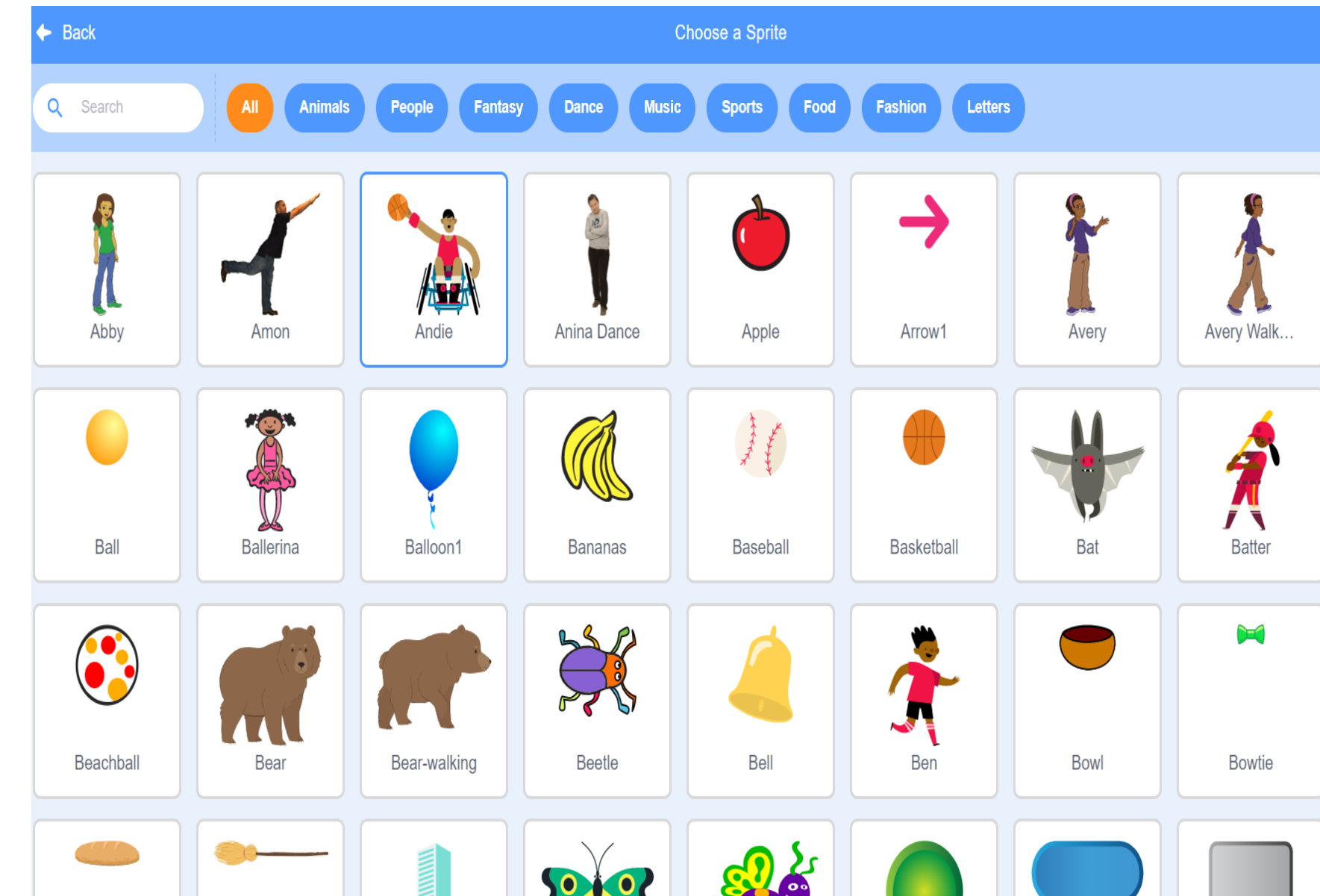
1) Select a Sprite that has 2 or more costumes.

a) Go to 'choose a Sprite from library'



b) Use your mouse cursor to go through each Sprite. Sprites that move have 2 or more costumes.

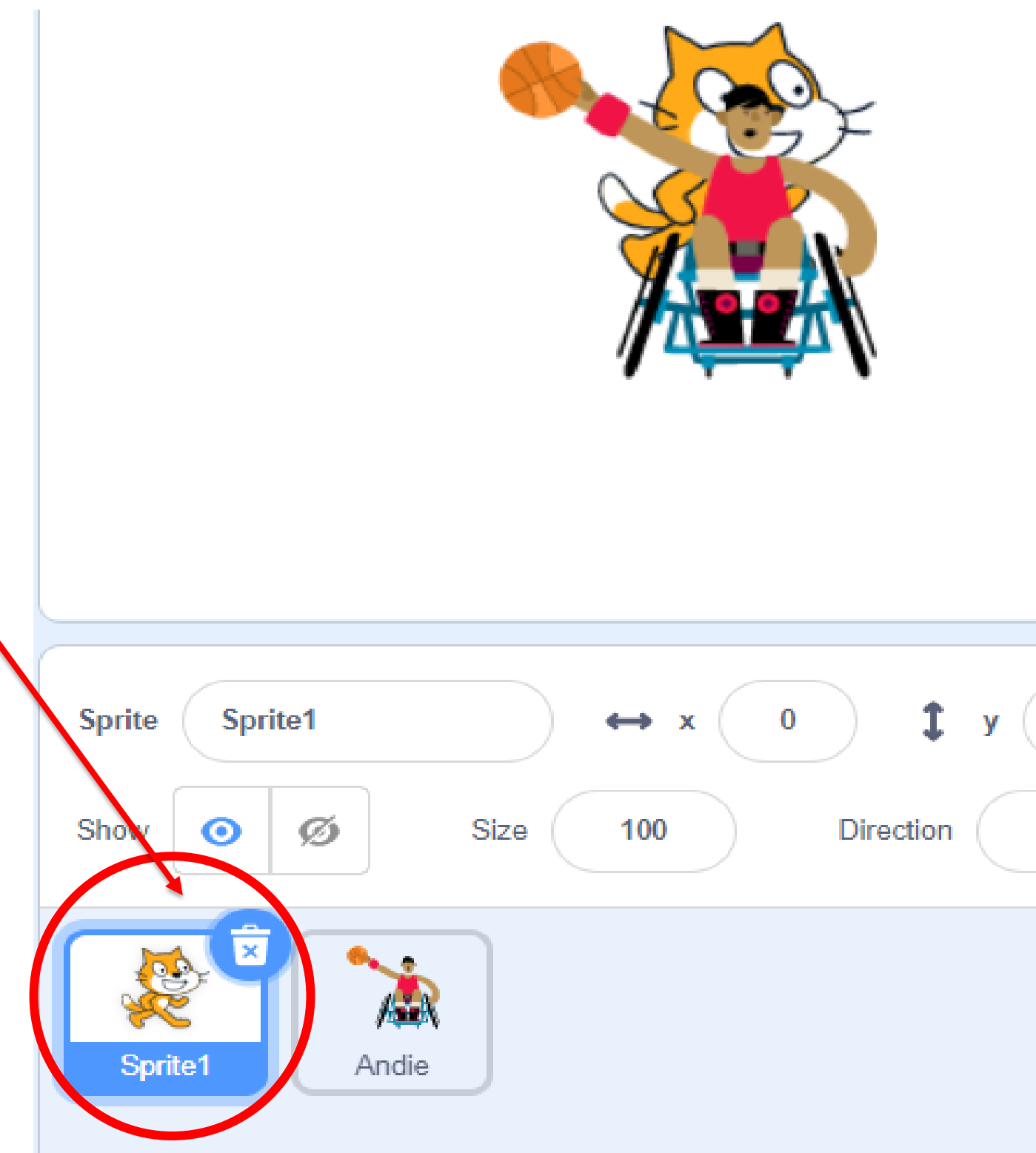
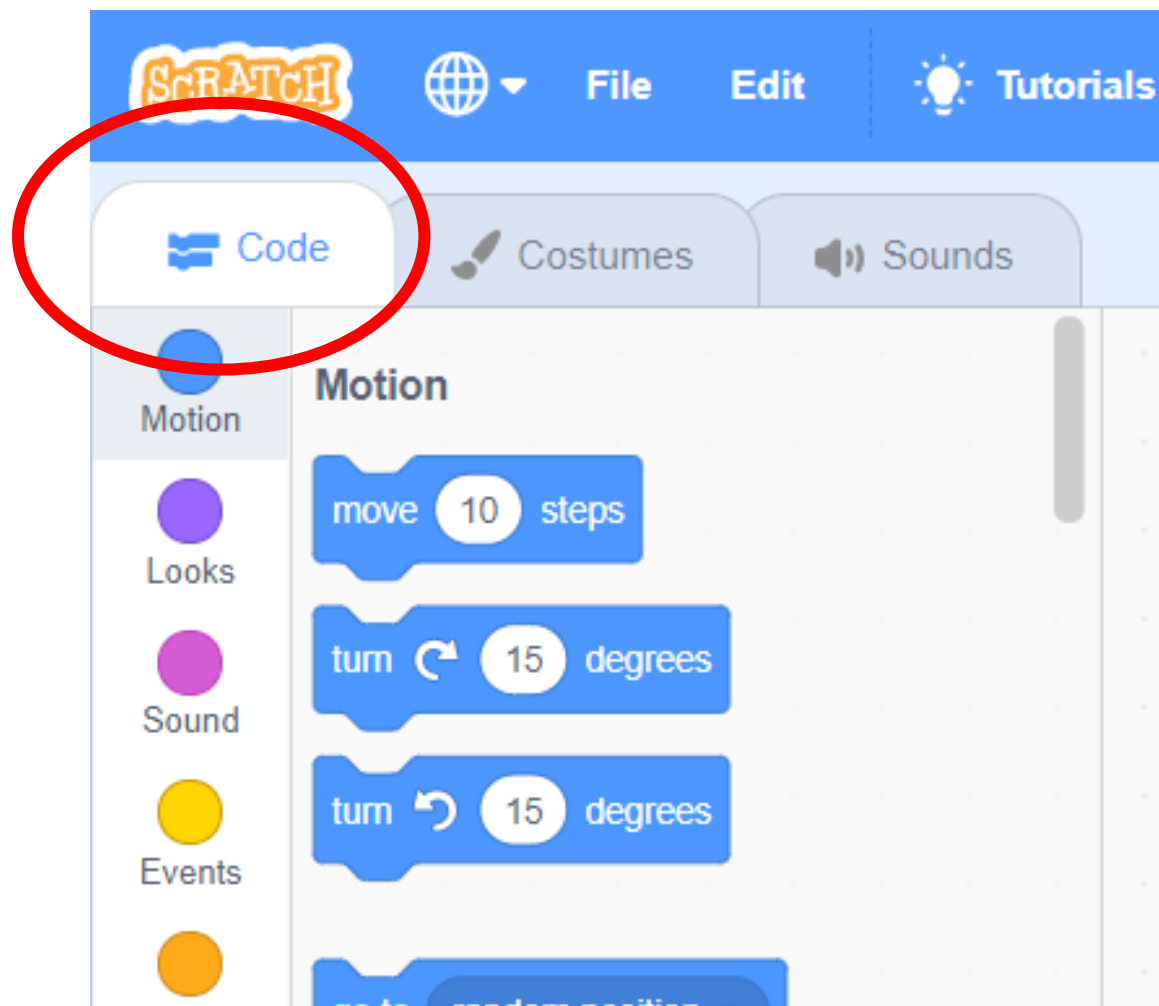
c) Select your desired sprite with multiple costumes.

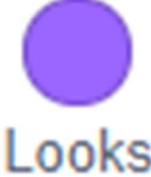
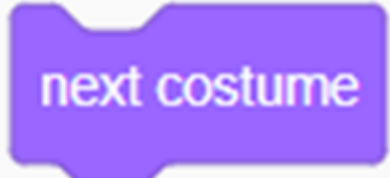




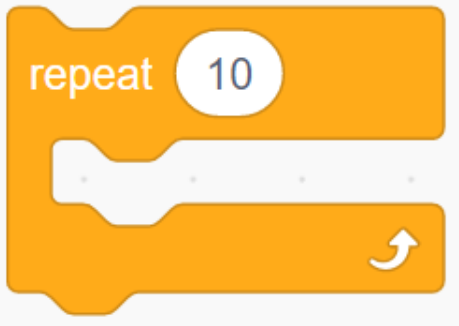
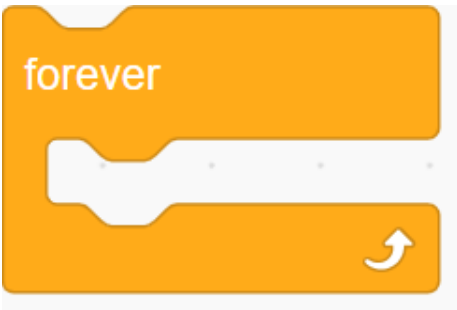
# LESSON 2: HOW TO CHANGE COSTUMES


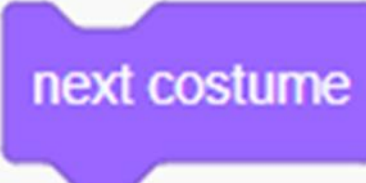
- 2) Delete the 'cat' so that only your desired sprite remains.
- 3) Ensure the 'Code' tab has been selected.



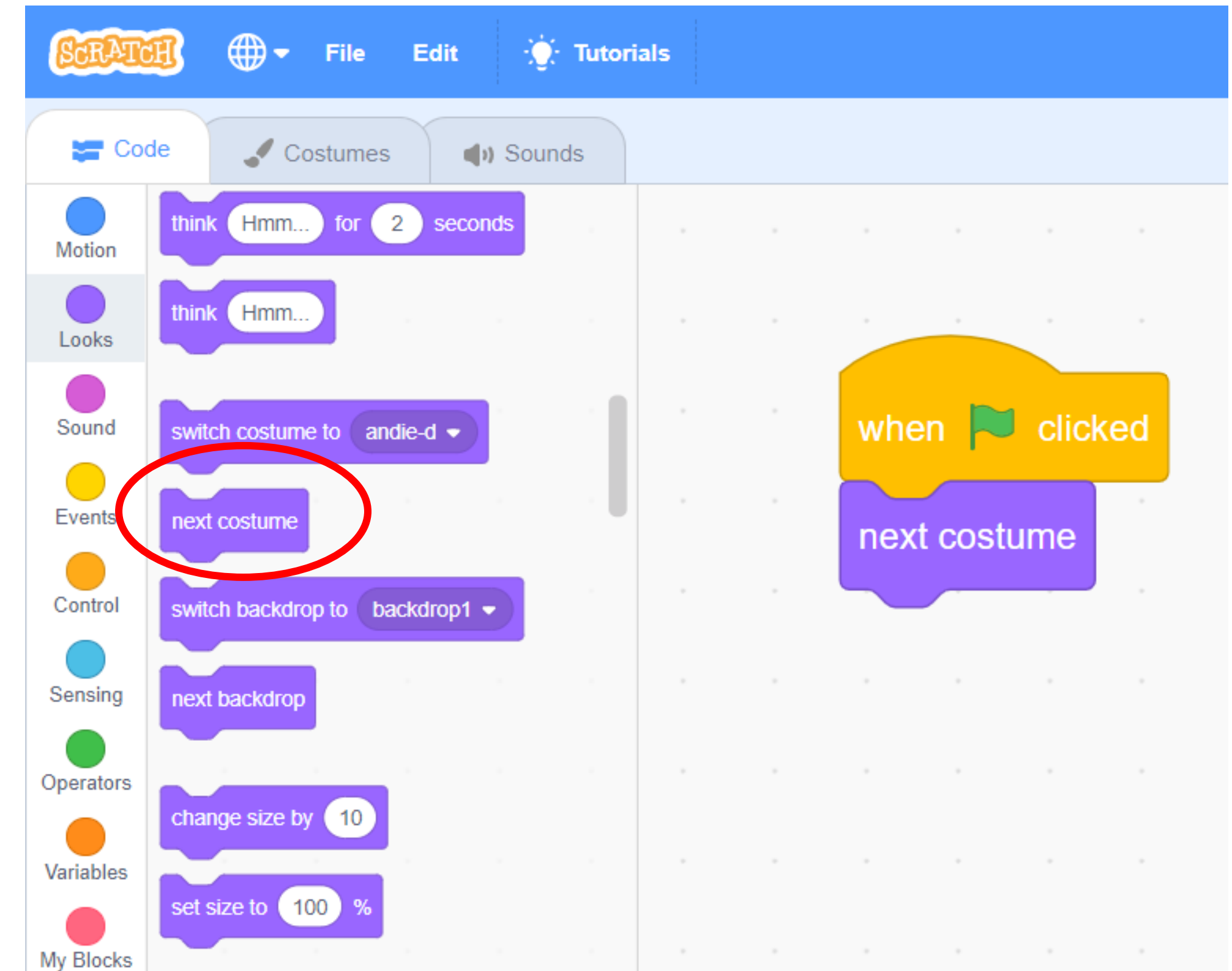
4) Go to  and drag  to the script area.

5) Remember to drag out  so the program can start

6) Try these blocks  

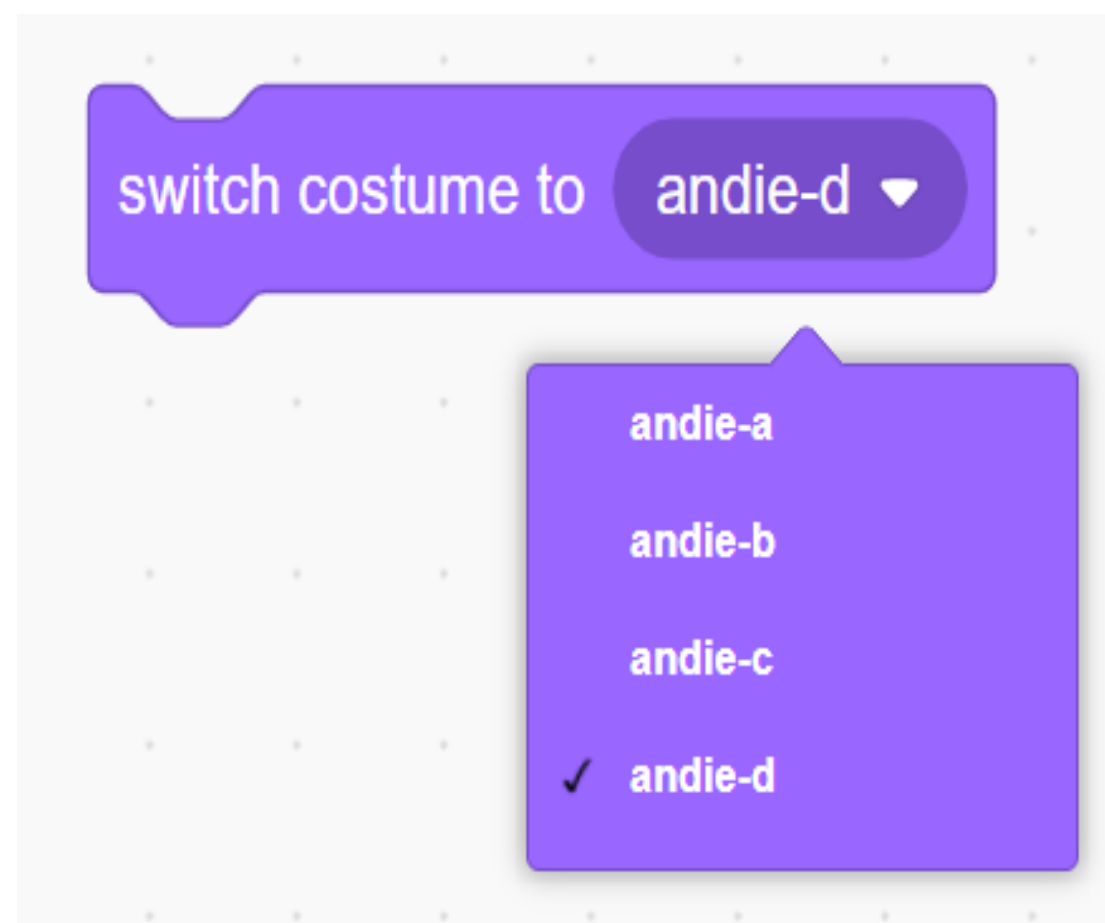
Remember to add  after 

without it you might feel dizzy!

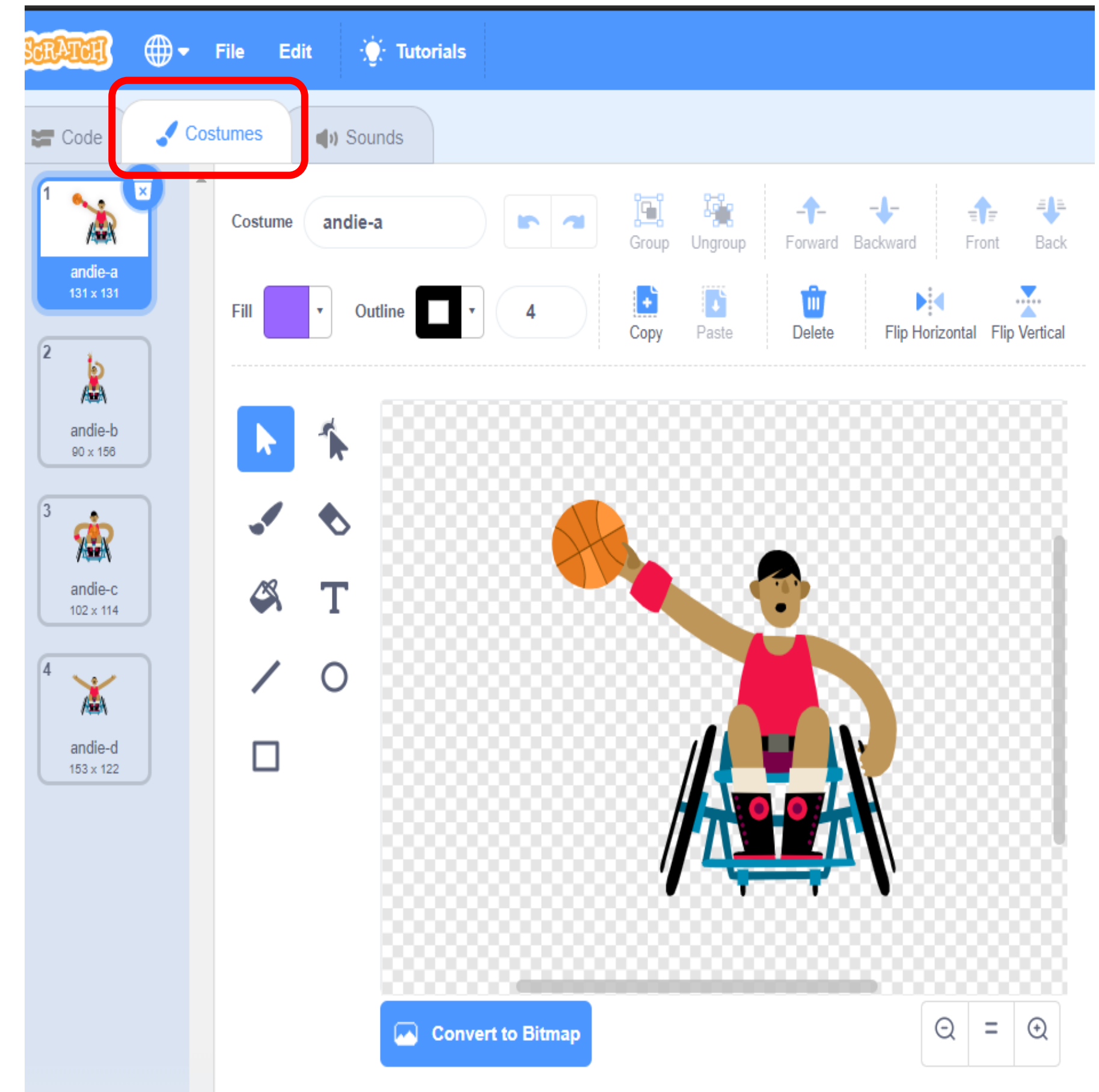


## Changing costumes for a Sprite

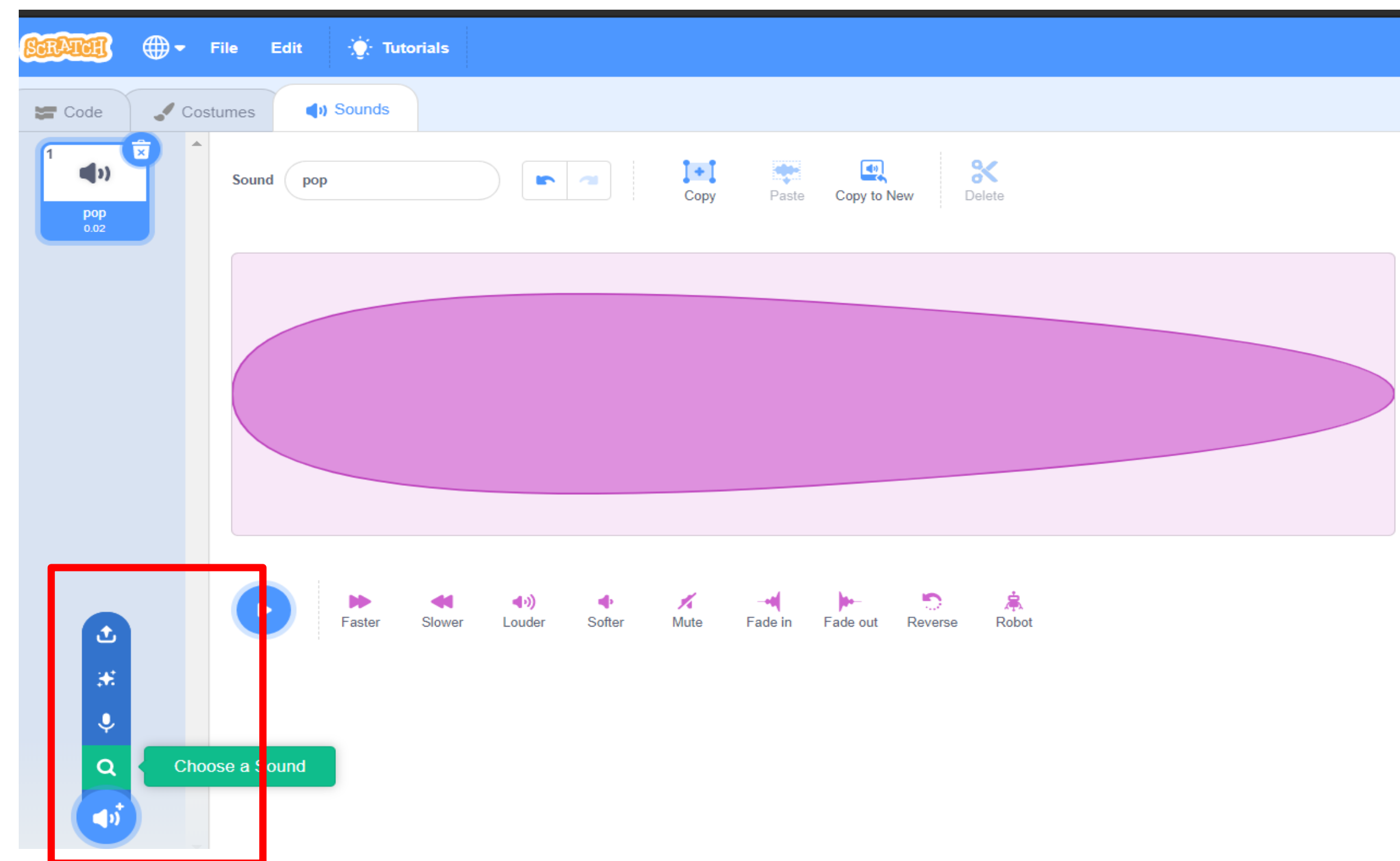
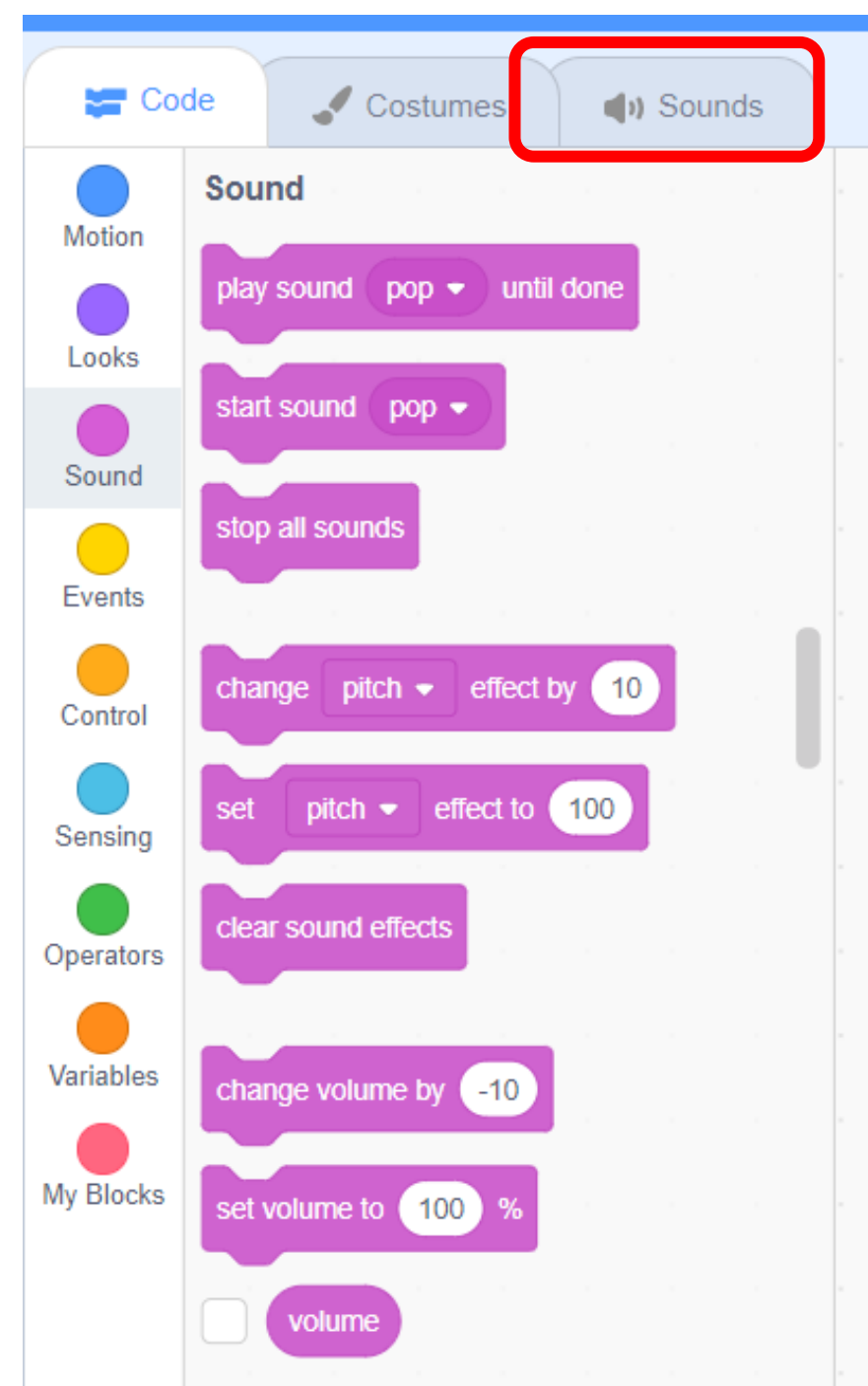
7) Try this block program  instead.



You can click on 'Costumes' tab to see the different costumes available for your sprite.

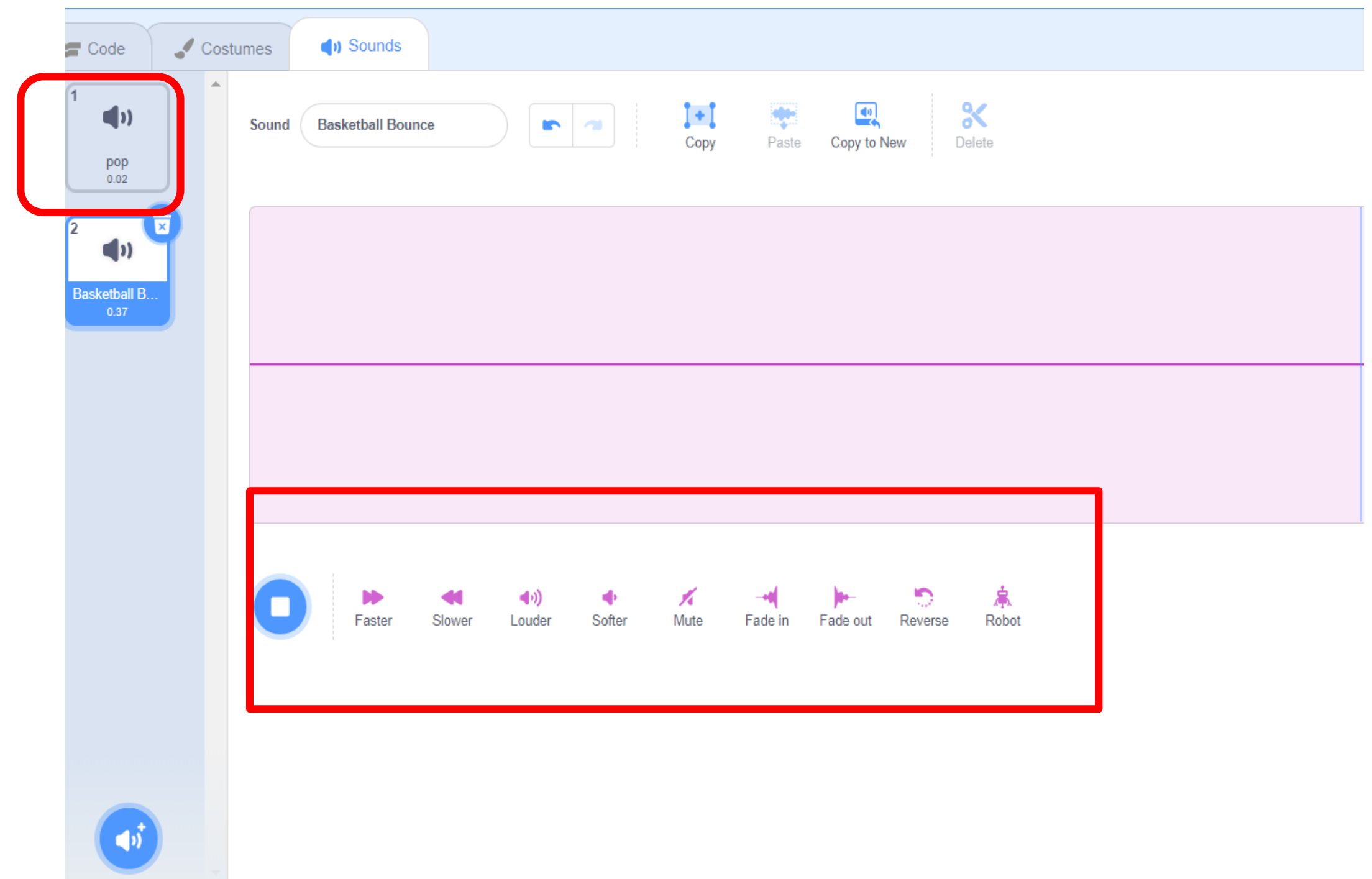
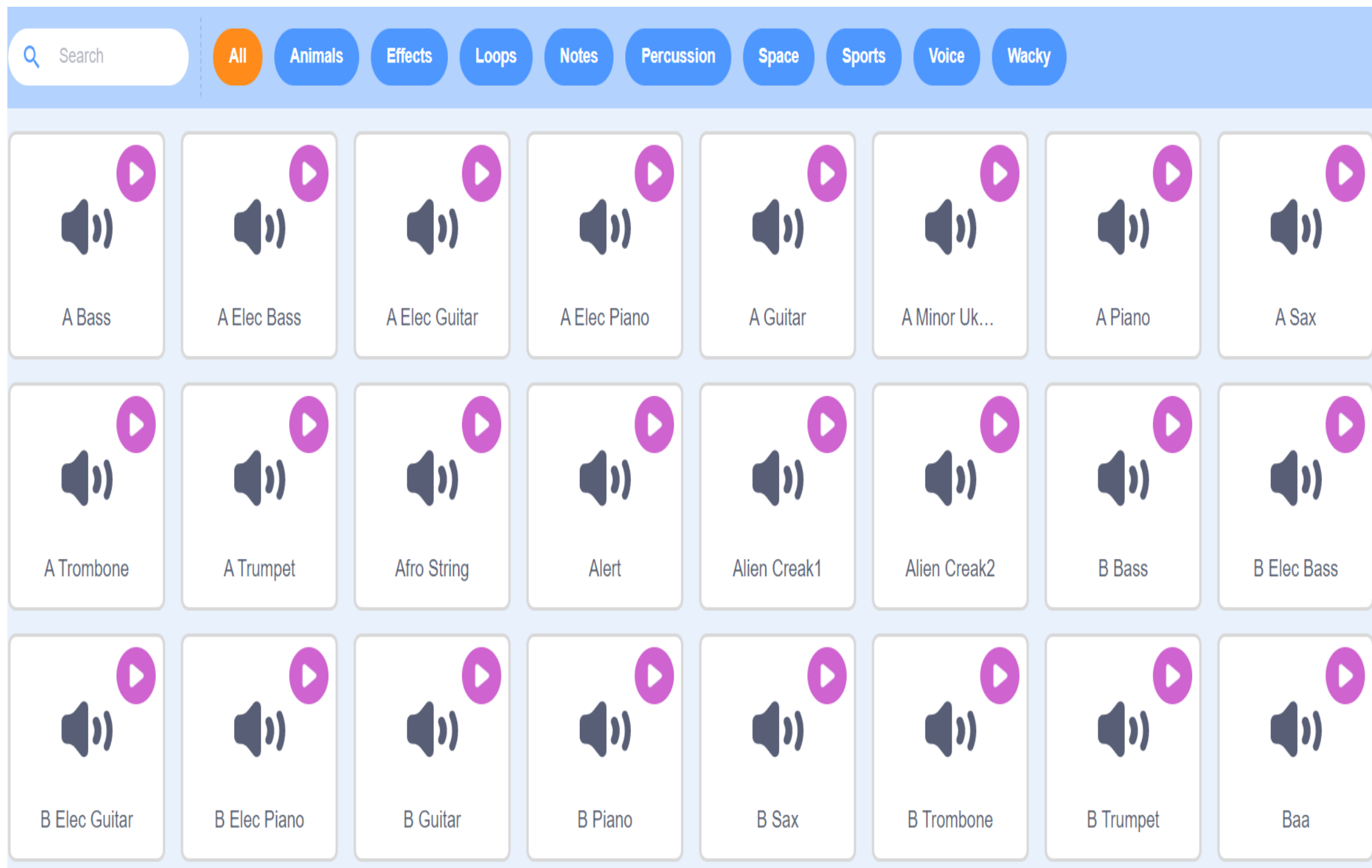


- Sounds can be added into the Scratch interface
- Click on 'Sounds' to add.
- There are again 4 different ways to add sounds into the Scratch interface





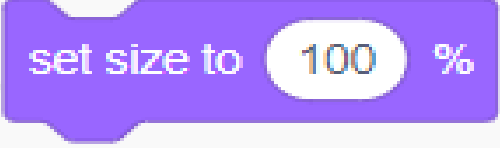
- Scratch has a inbuilt sound Library. Feel free to explore the library.
- Click on one of the sounds that you like to add to your program.
- The chosen sound will be displayed (refer to the picture below). Sounds can also be edited.

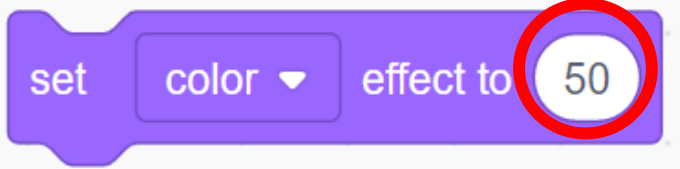


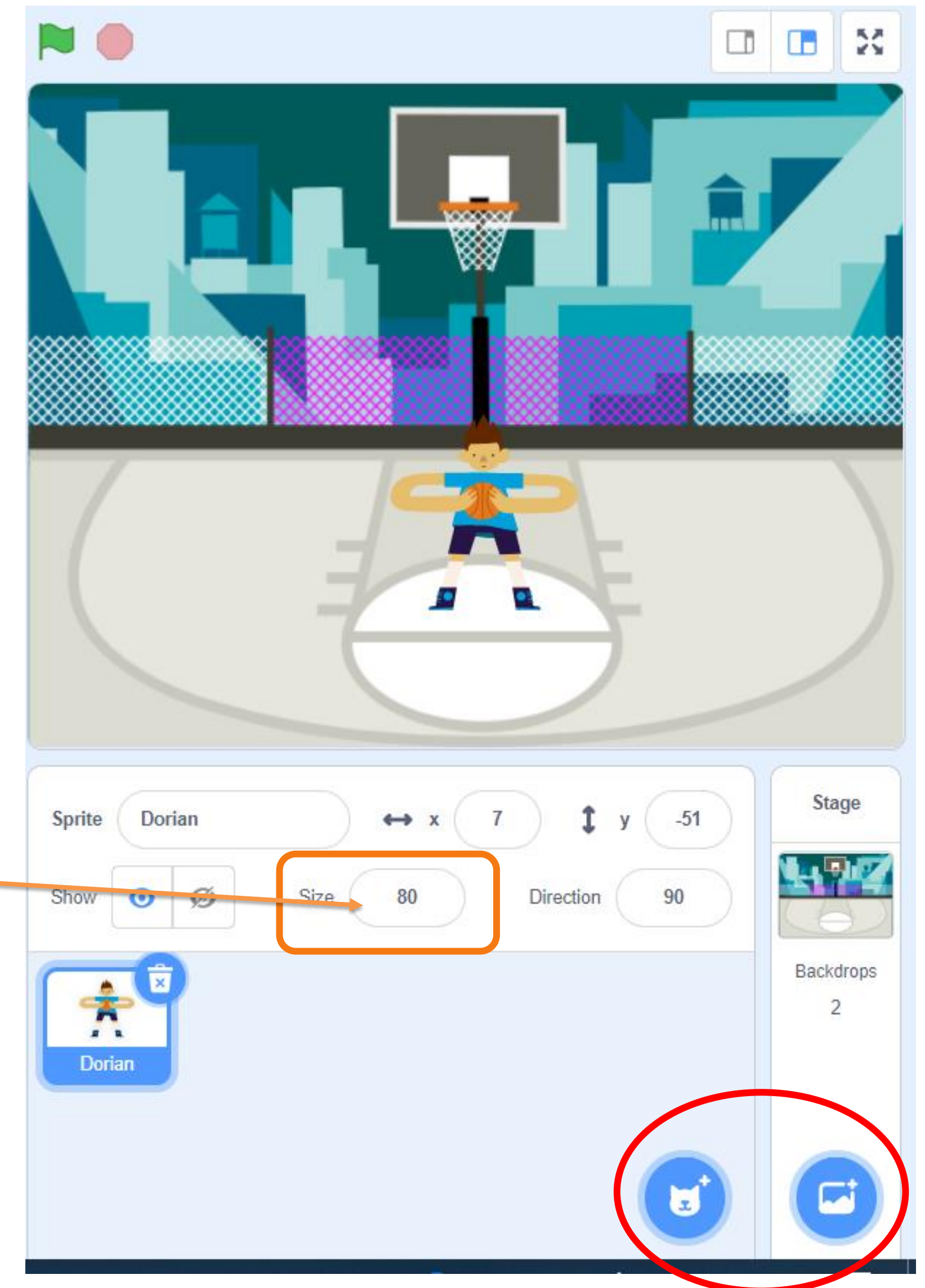
# LESSON 2: PRACTICE

Programming a 'Stay home' animation during the Covid-19 pandemic.

1) Choose a sprite (*delete the cat*) and a backdrop (*refer to the red circle in the picture*)

2) Adjust the size of the sprite by dragging the  to the script area or by typing '80' at the info area.

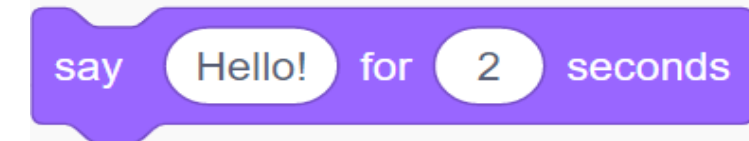
3) Drag  to the script area and type the number '50' in the blank space.



# LESSON 2: PRACTICE

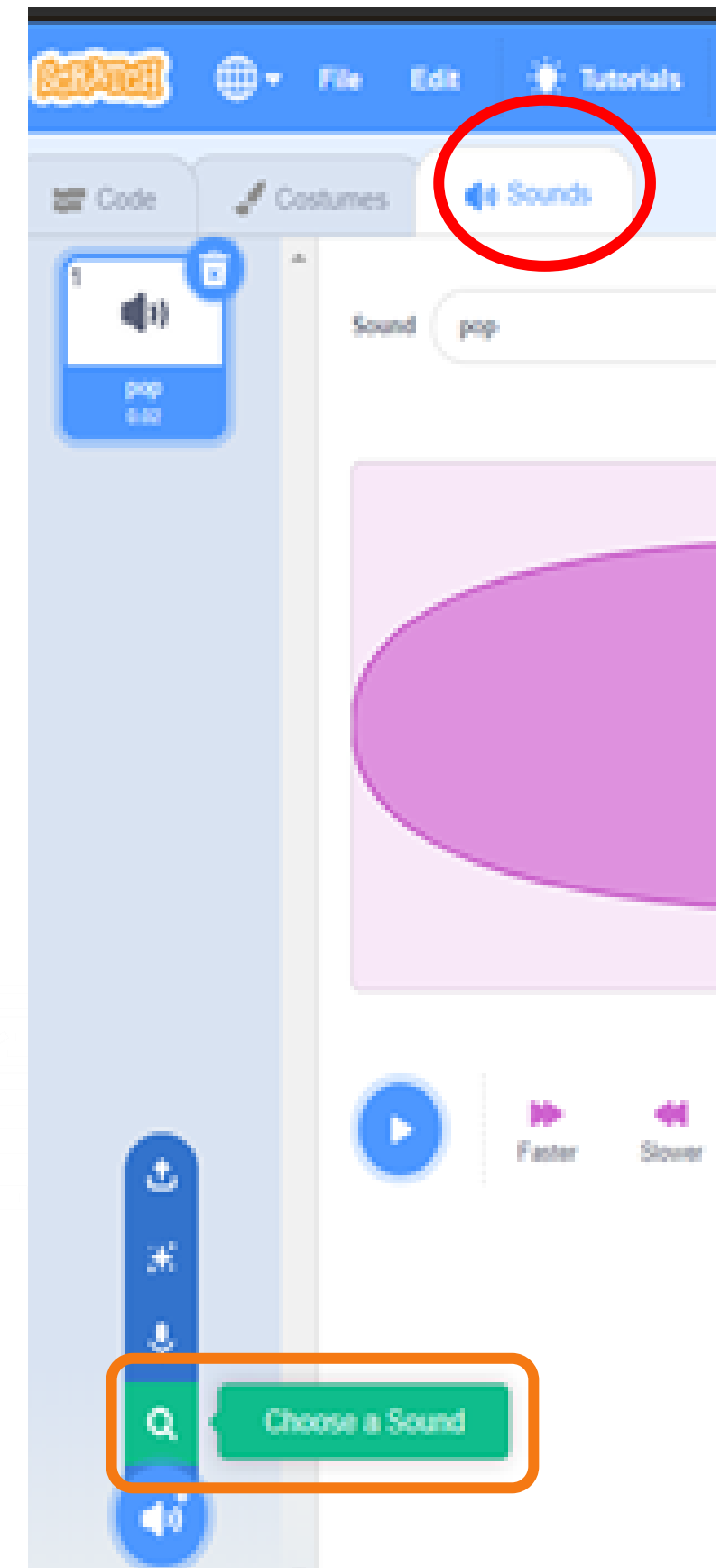
4) Select a sound from the sound library.

5) Drag  and  into the script area.

6) Drag  to the script area and replace 'Hello!' with 'Let's stay home!'

7) Lastly, don't forget to include  to start the program.

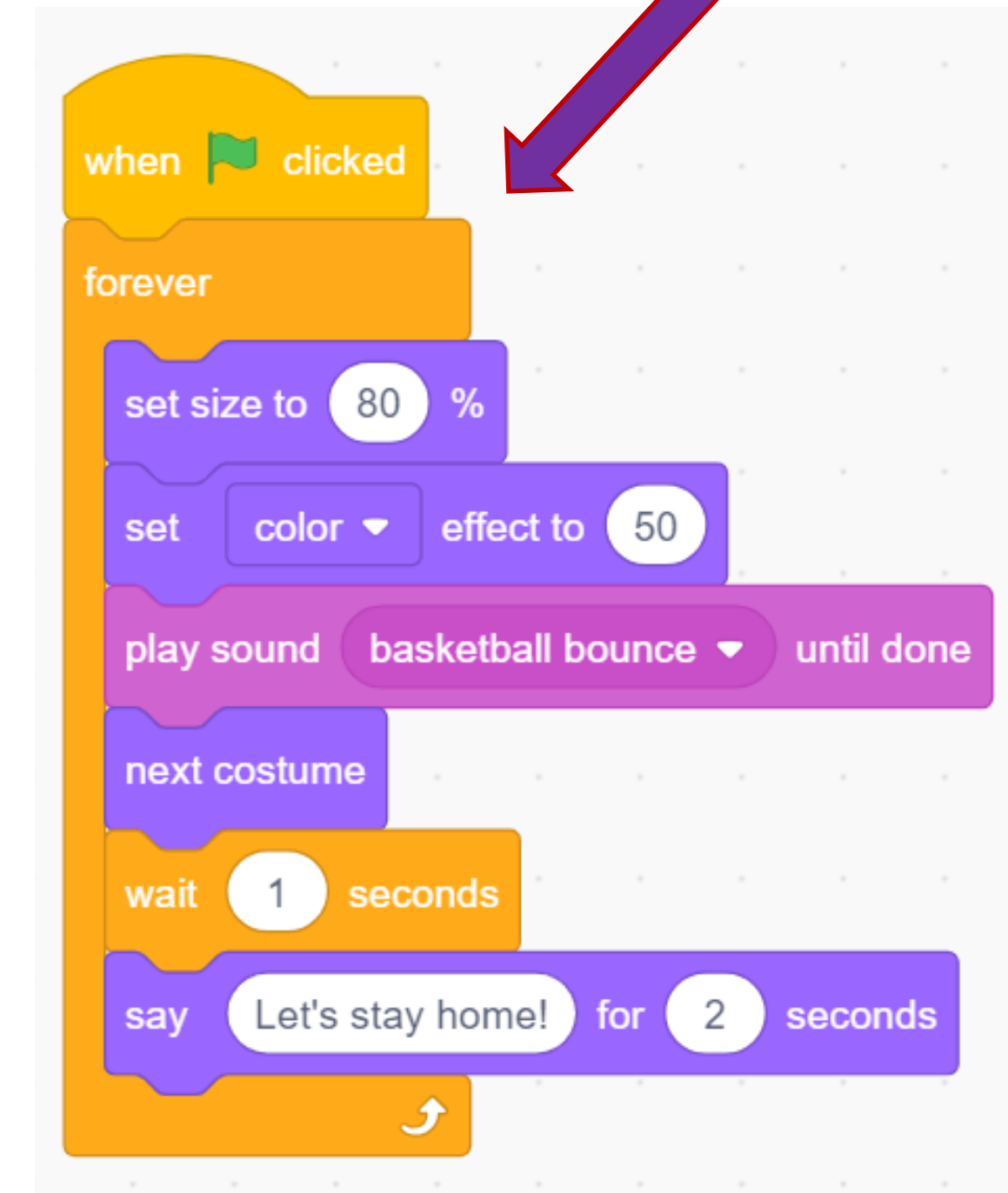
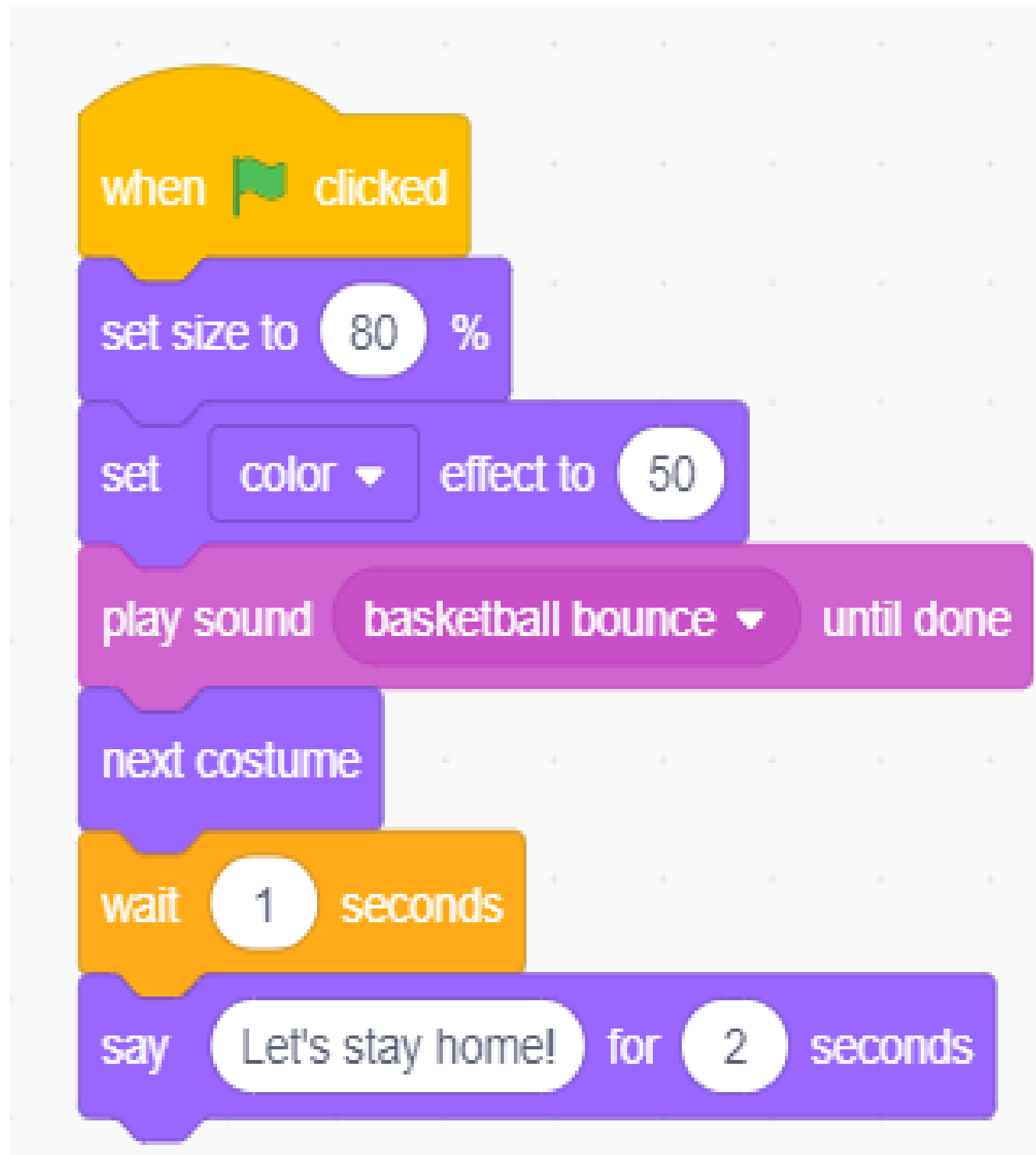
8) Remember to save your project



# LESSON 2: PRACTICE

## SOLUTION:

- This program will run **ONCE**.
- If you want the program to run forever or repeat , ensure the appropriate loop has been used.

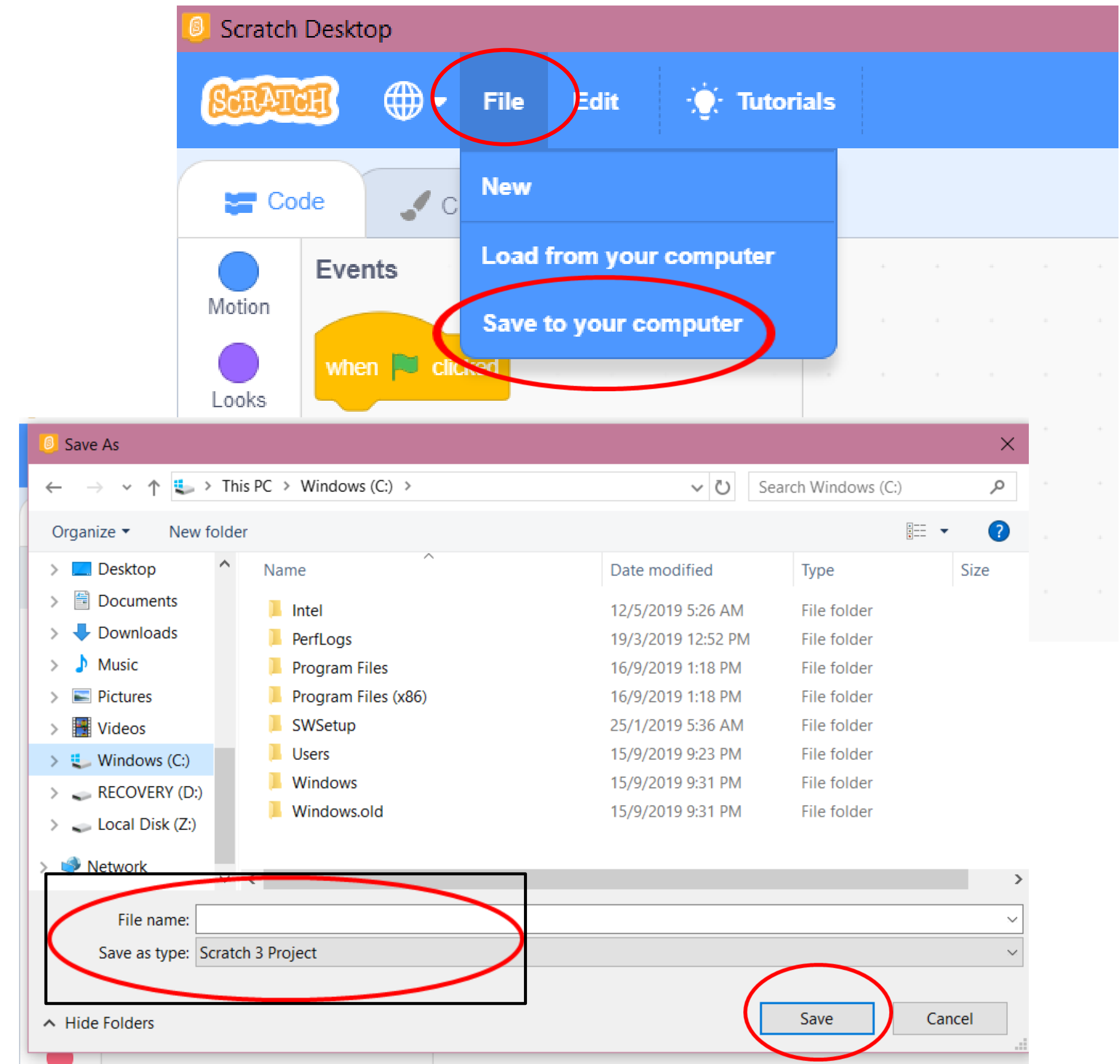




# SAVING A PROJECT

Dear Parent, please follow the following to save your child's work:

- 1) Click on '**File**' at the top left-hand corner
- 2) Click '**Save to your computer**'
- 3) Look for '(D:)' or any other drive or location where you want to save the file
- 4) Under File name 'key in (name of the project that u want )
- 5) Click on '**Save**'
- 6) After you have saved the project, you can clicked 'x' at the top right-hand corner of Scratch to close it.



# LESSON 2: RECAP

What we have learned so far:

- ✓ Concepts of Looks
- ✓ What are the differences between Sprites and costumes
- ✓ How to switch costumes
- ✓ How to add sounds to our codes
- ✓ Programming a 'stay home' animation



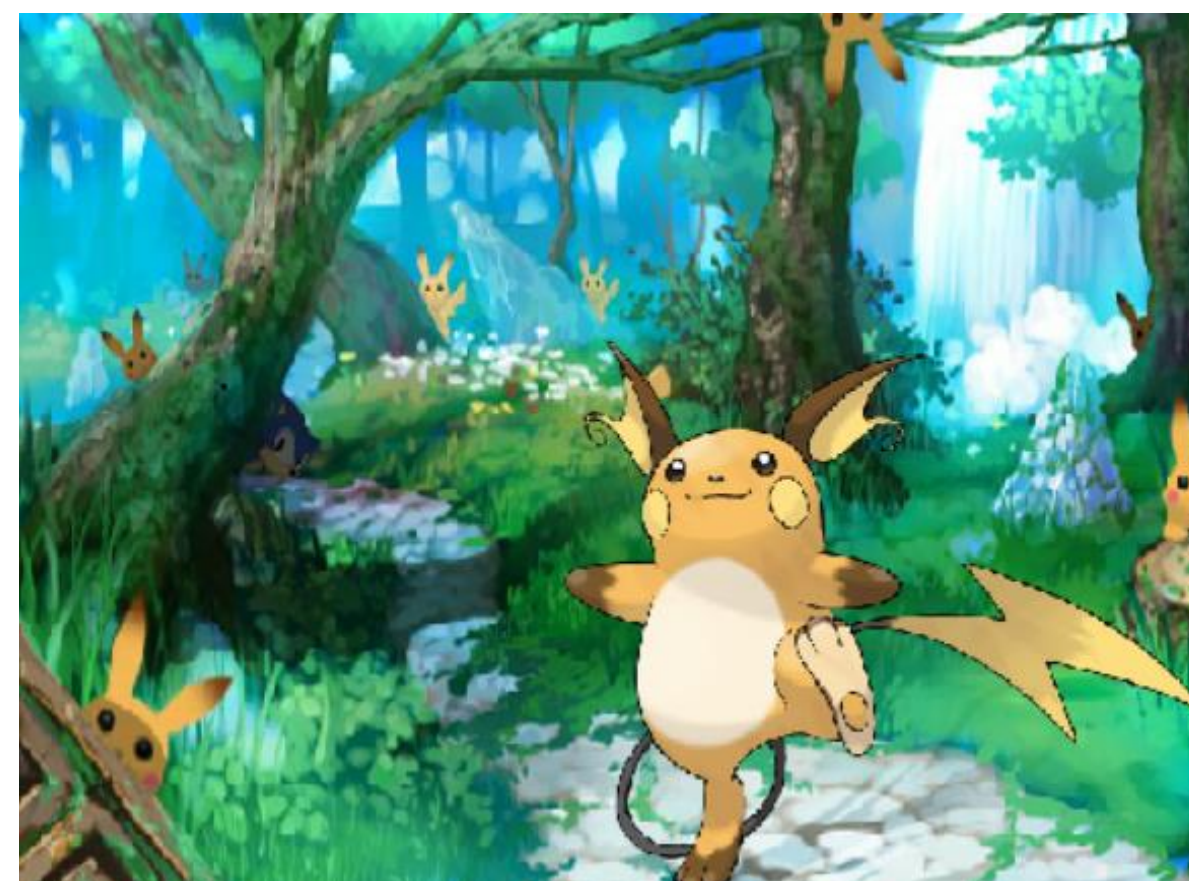


You have now learned everything you need for the following challenge:

“Evolve The Pokemon”

What you will need

- 1 Sprite
- 2 Costumes
- 1 Background

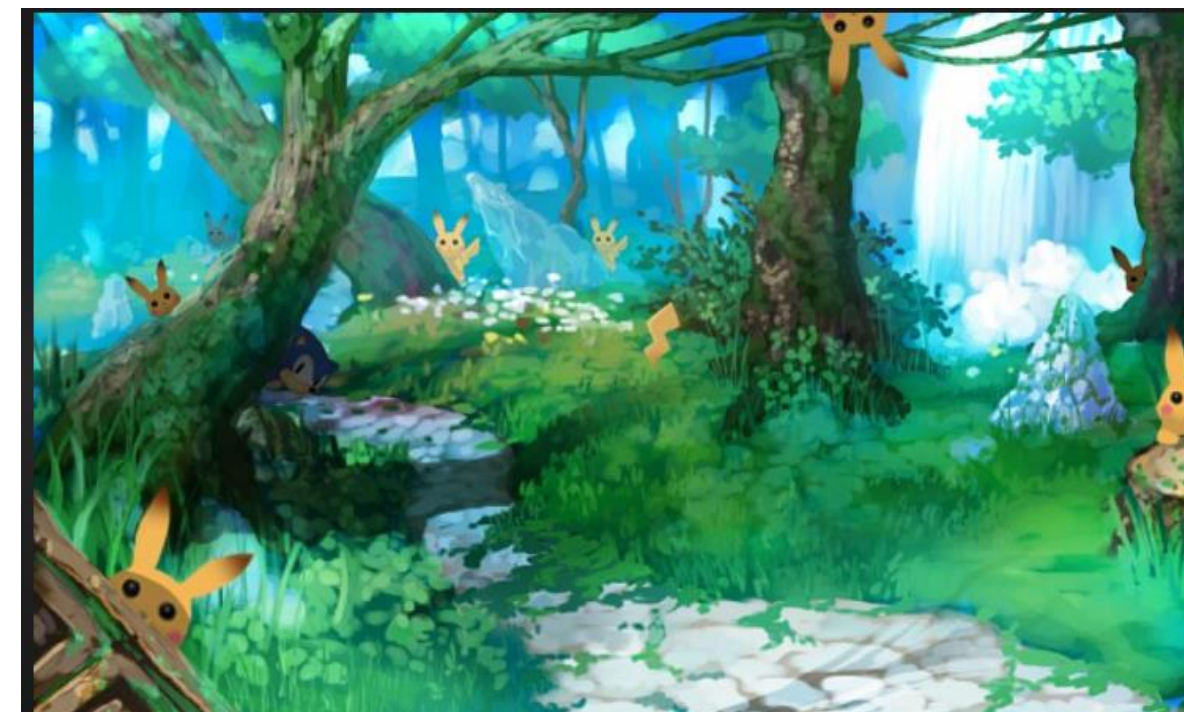
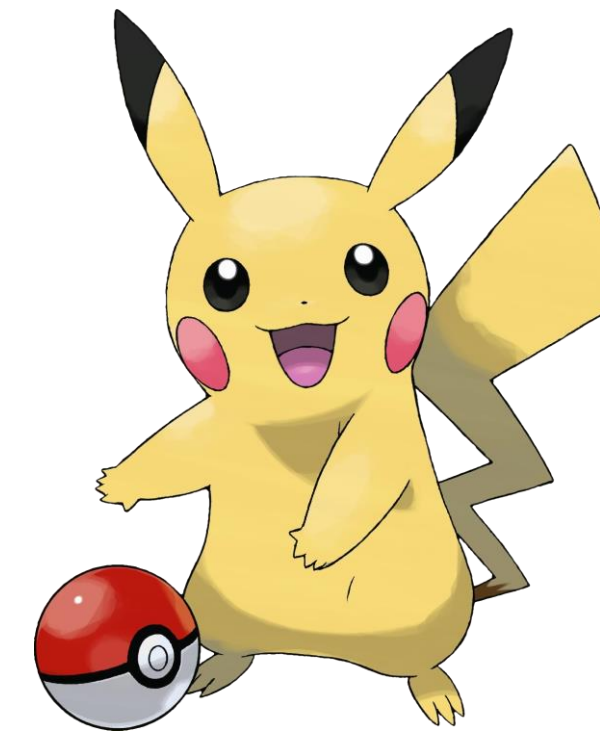




# LESSON 3: POKEMON ANIMATION

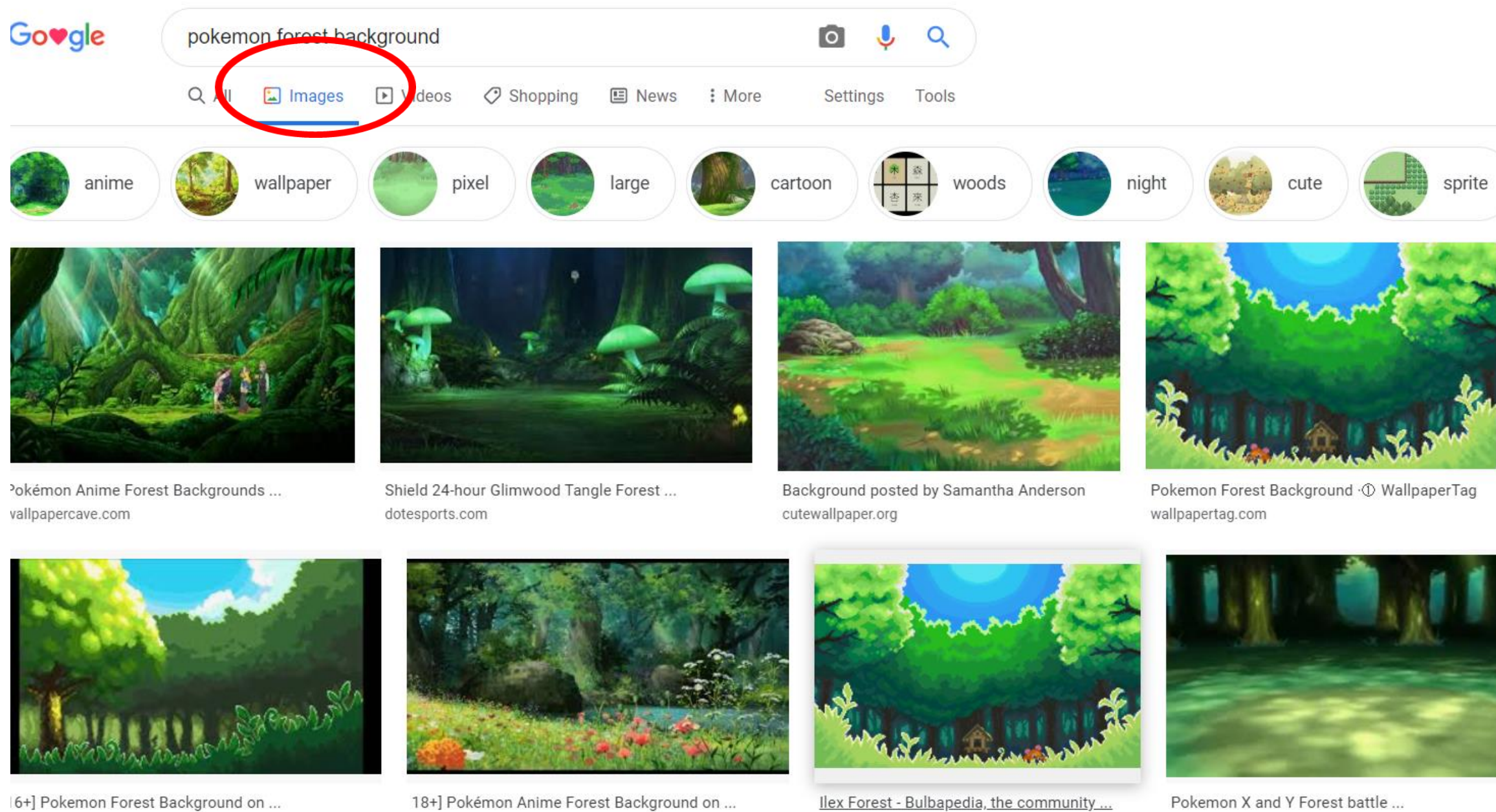
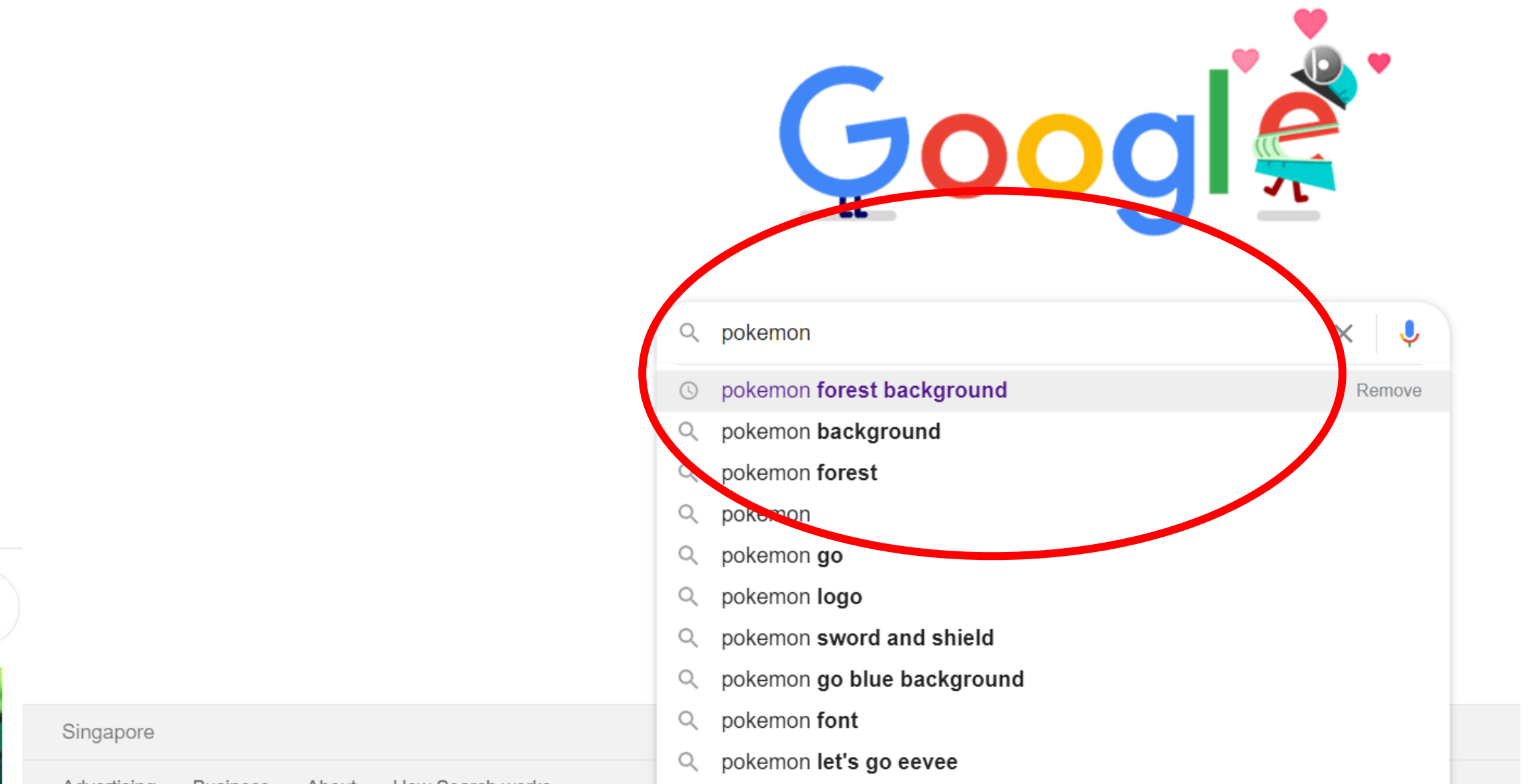
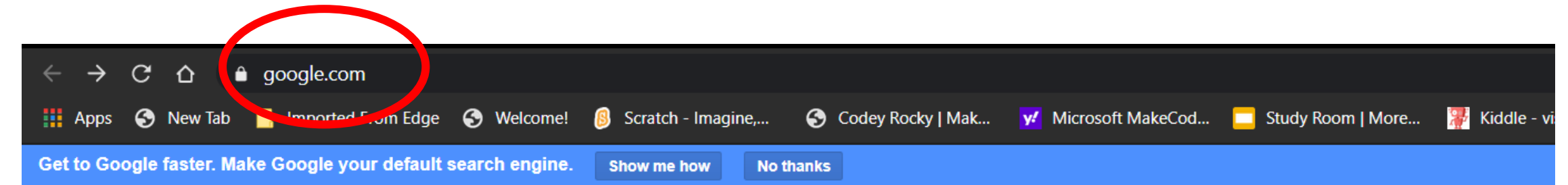
1) You need to google for 3 pictures on the internet:

- ✓ Pikachu
- ✓ Raichu
- ✓ Pokémon forest background





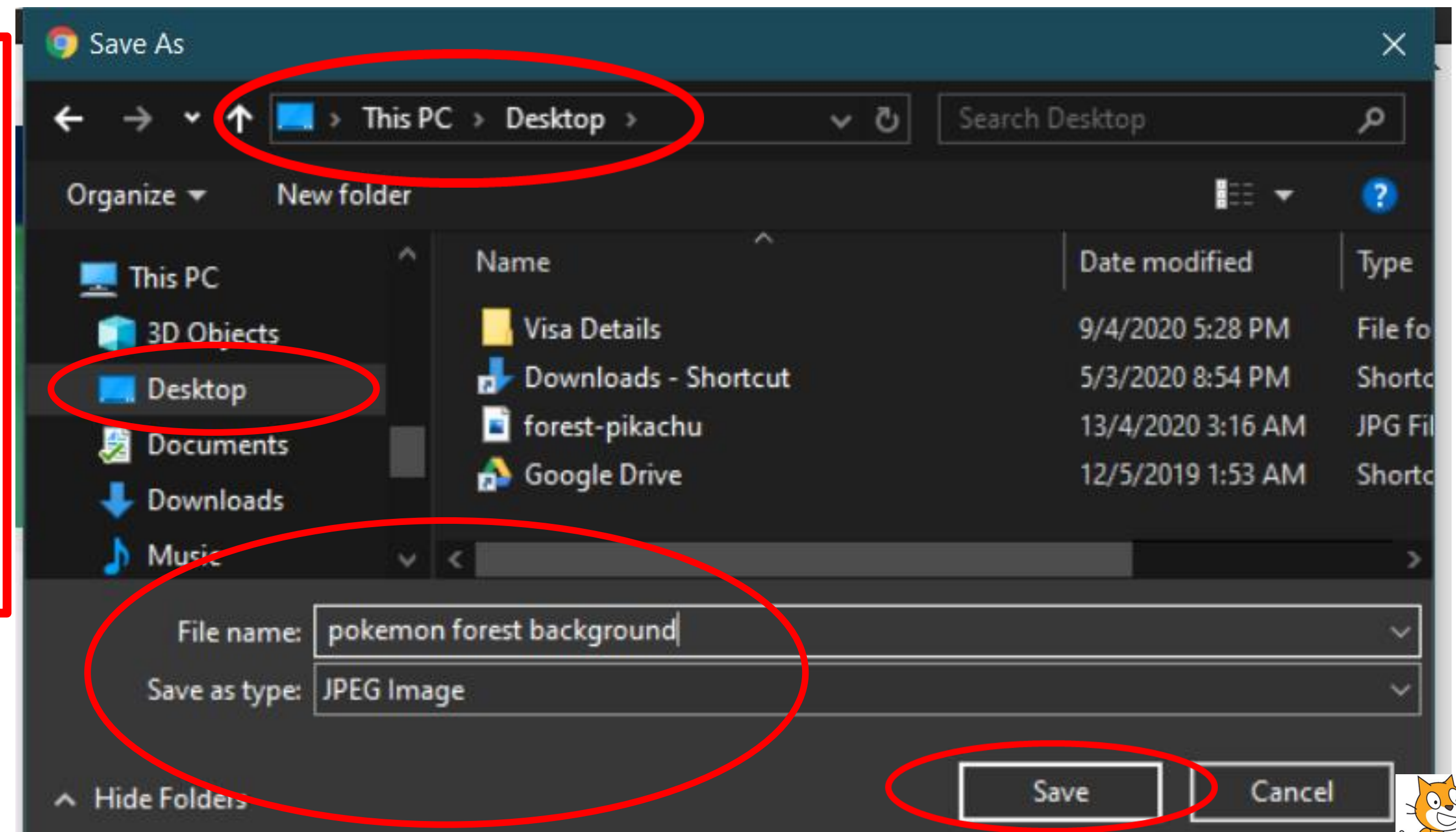
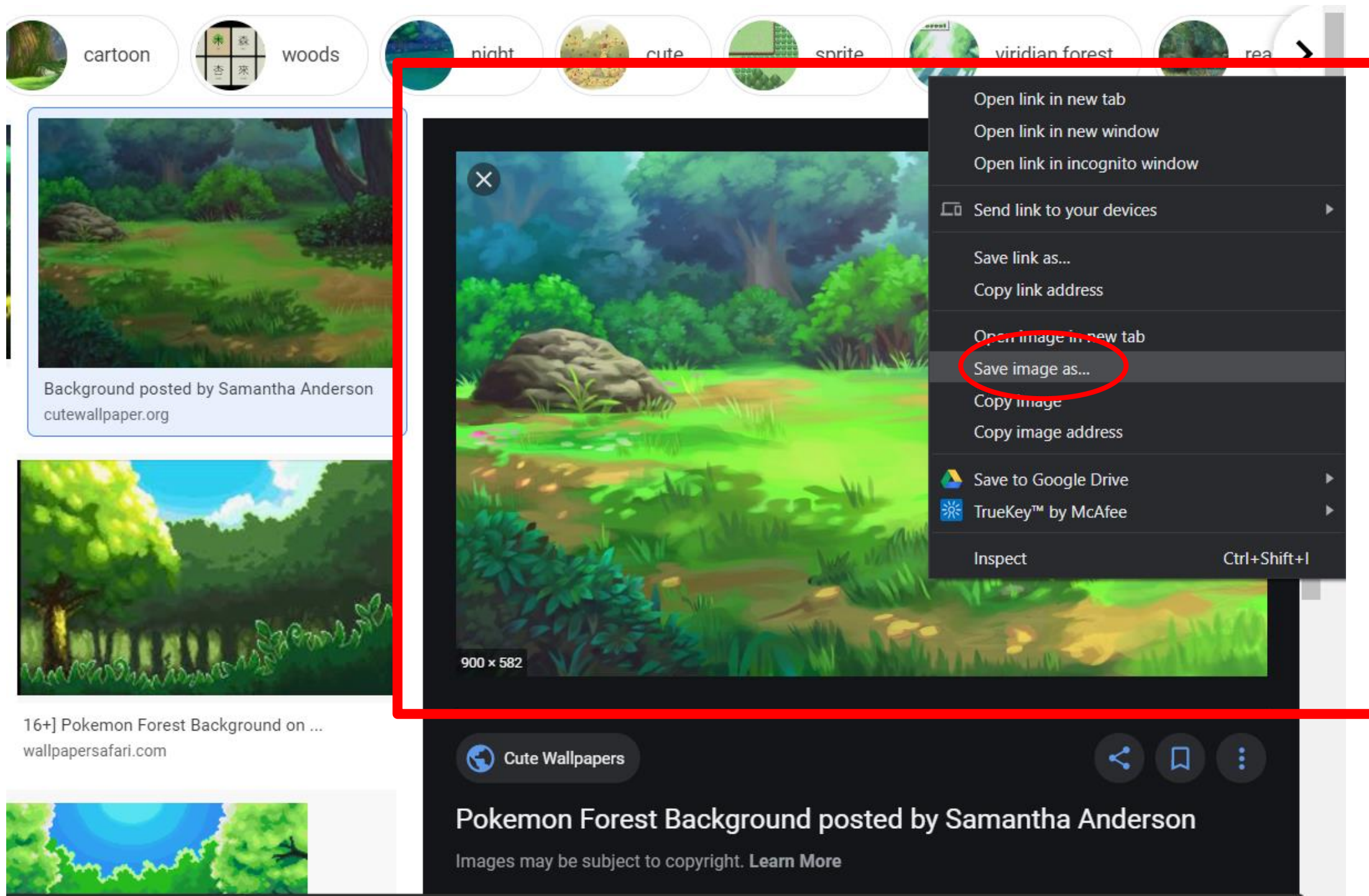
- 1) Type google.com on the internet.
- 2) Type '***pokemon forest background***' and press 'enter' on your keyboard
- 3) Click 'Images' and choose one background of your choice, and click on the image that you chose





4) Bring your mouse cursor to the open up image and right-click on your mouse, and a drop-down box will appear. Click 'save image as....'

- 5) 'Save As box' will appear.
- 6) Look for 'Desktop' or any other folder that you want to save this image in, and click it.
- 7) Under Filename: type in '***pokemon forest background***'
- 8) Click 'save'



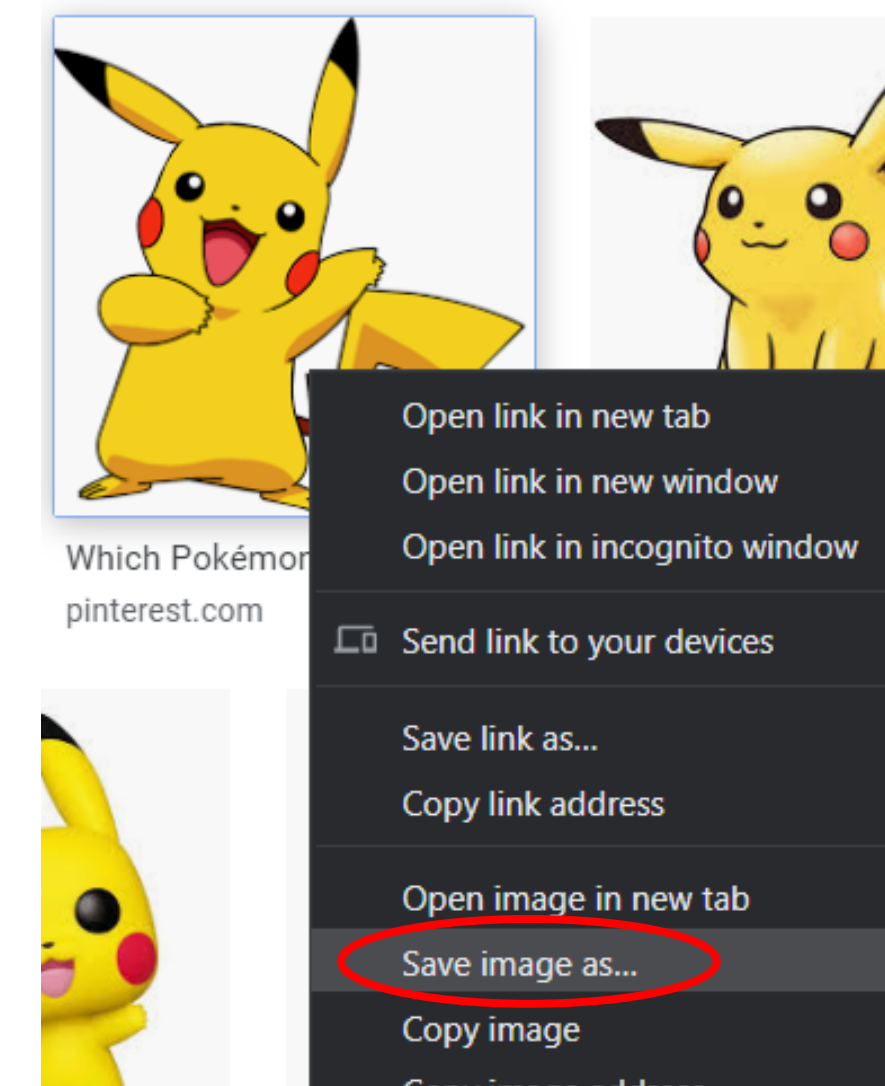
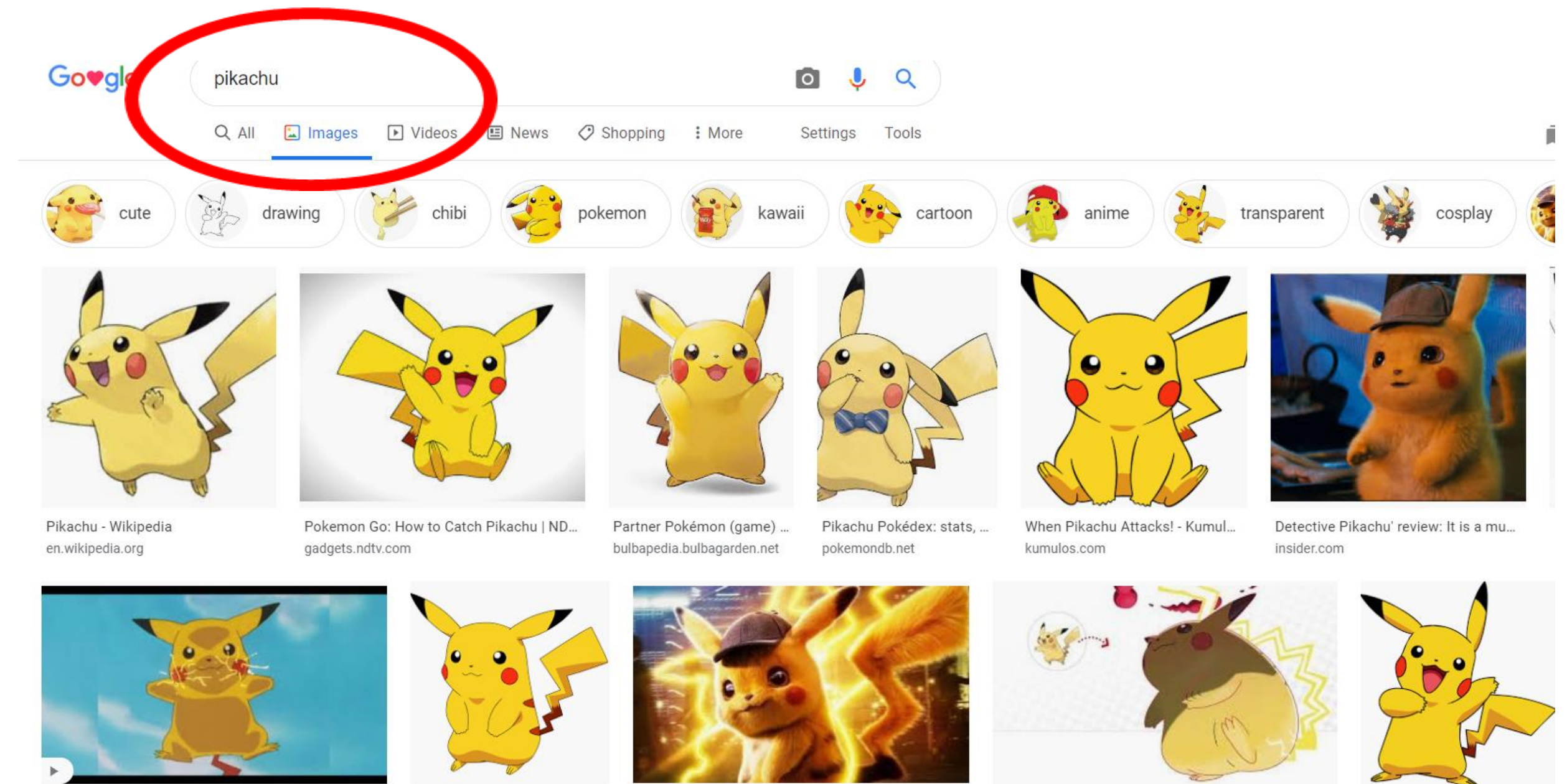


# LESSON 3: POKEMON ANIMATION

Same method to find images for Pikachu and Raichu:

- 1) Type google.com on the internet.
- 2) Type '**Pikachu**' and press 'enter' on your keyboard
- 3) Click 'Images' and choose one image of Pikachu of your choice
- 4) Right-click on your mouse and click 'save image as'
- 5) Save the image as 'pikachu' under Filename and click 'Save'

Do the same steps as the above for Raichu.

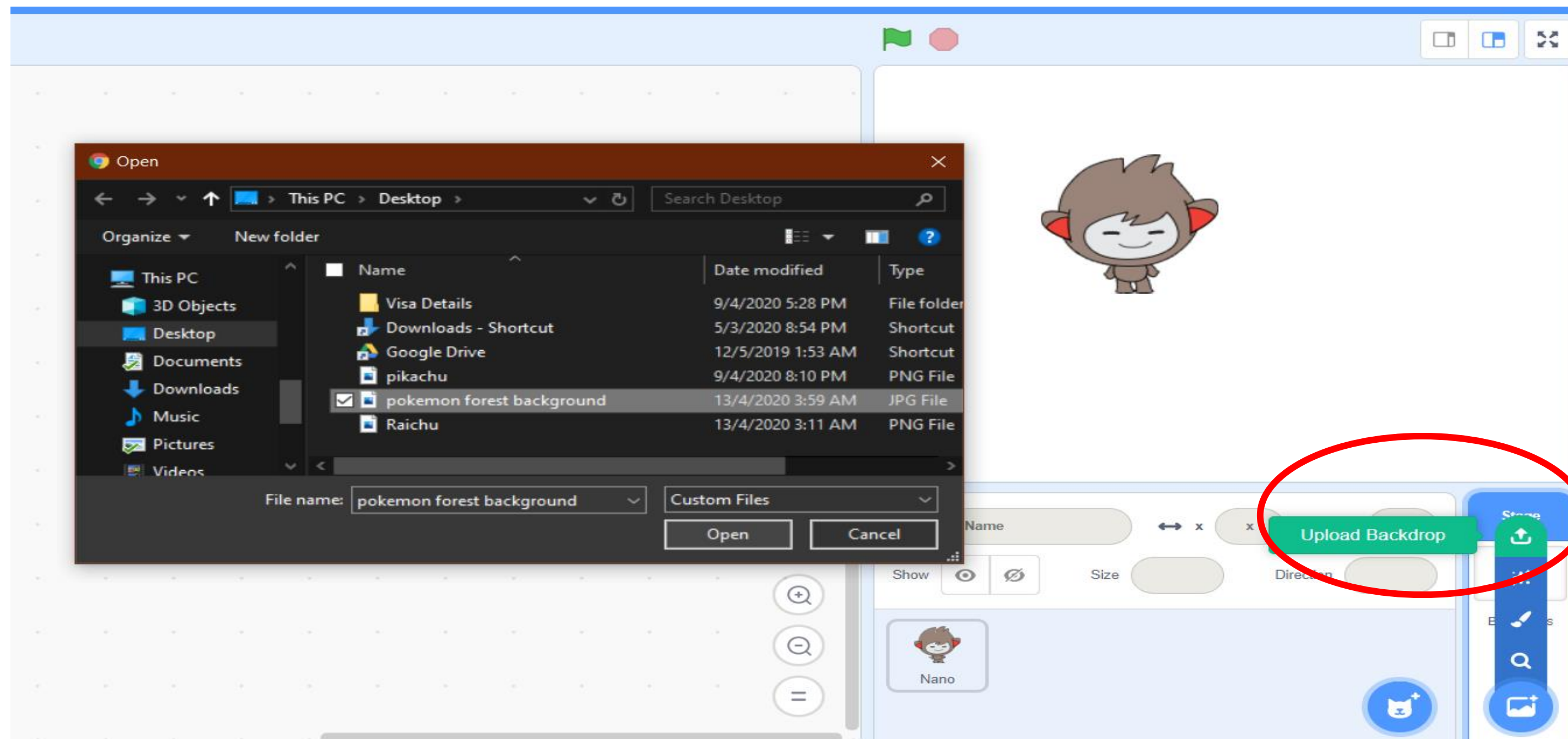




# LESSON 3: POKEMON ANIMATION

Now that you have all the pictures to create your animation, please go to Scratch website to start creating your animation!

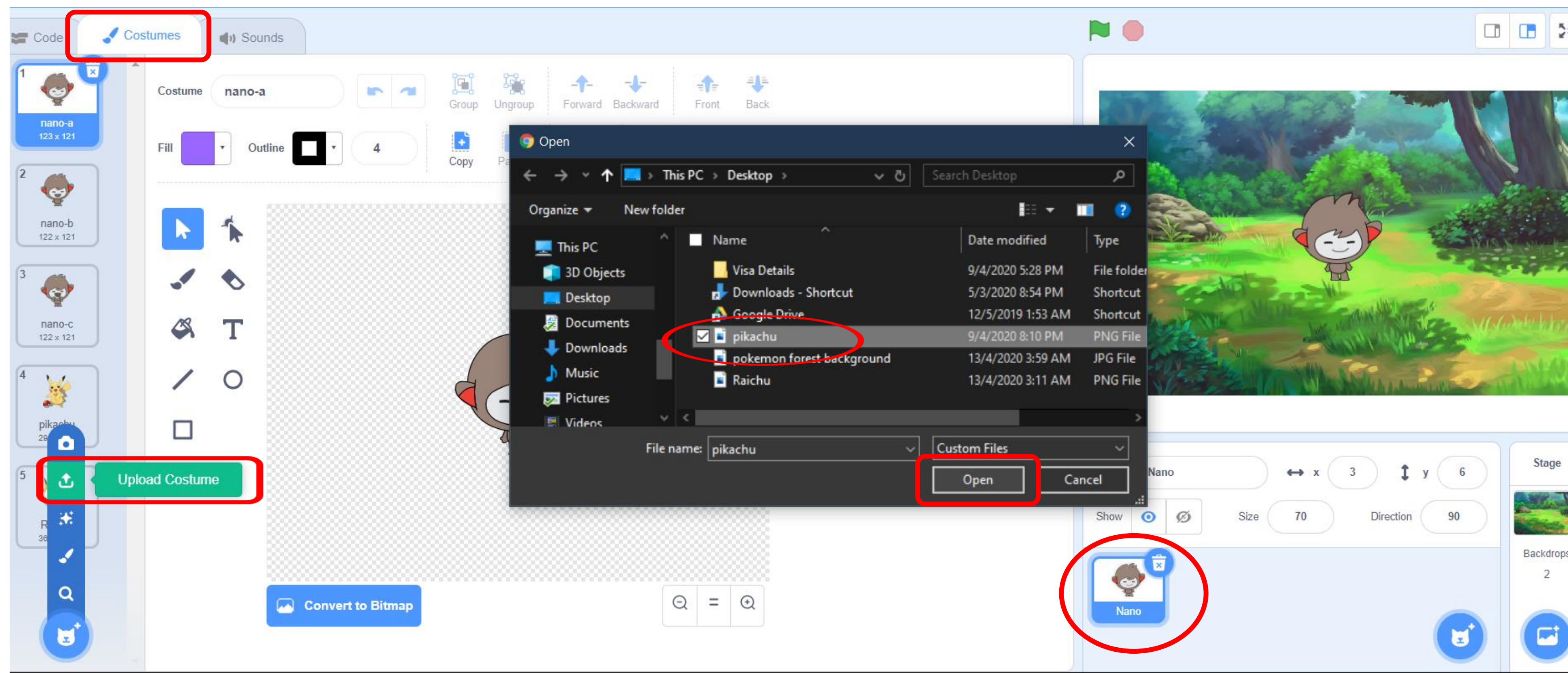
- 1) Choose a Sprite from the Scratch library
- 2) Insert the 'Pokémon forest background' that you have saved as the backdrop





## 3) Upload Pikachu and Raichu as **COSTUMES**

- Click on your Sprite and then click on 'Costumes' and click 'Upload Costume' to add in Pikachu.
- Do the same for Raichu.

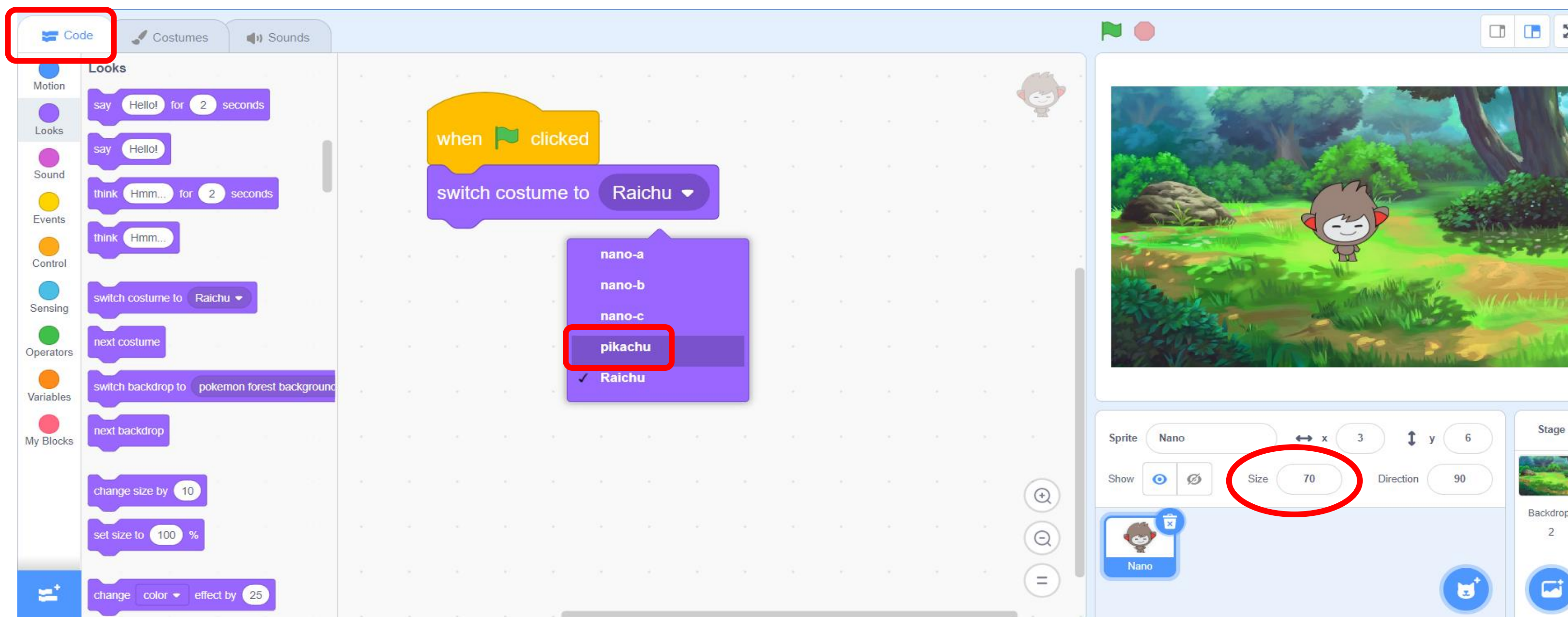




4) If you find that Pikachu or Raichu are too big, you can change the size of your **Sprite** so that when your Sprite changes costume to Pikachu or Raichu, their size will change accordingly.

5) Click 'Code' and get ready to do the coding.

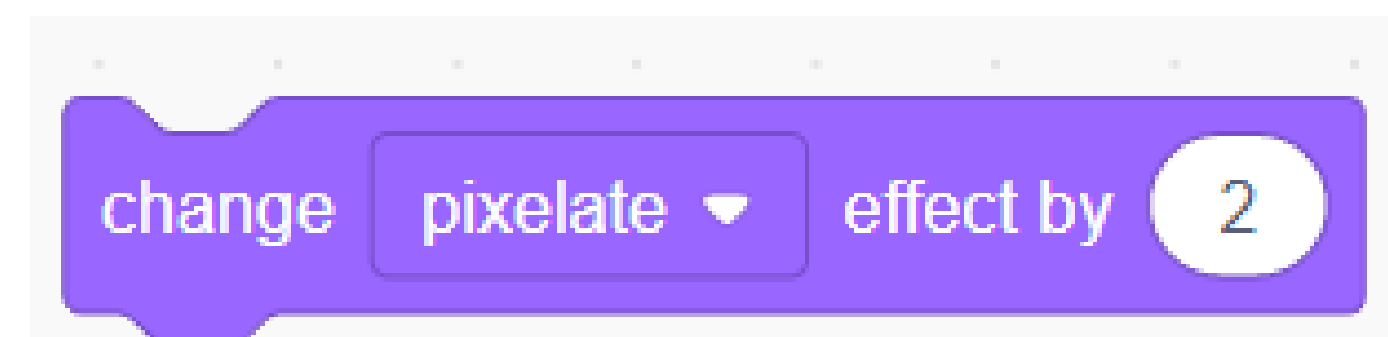
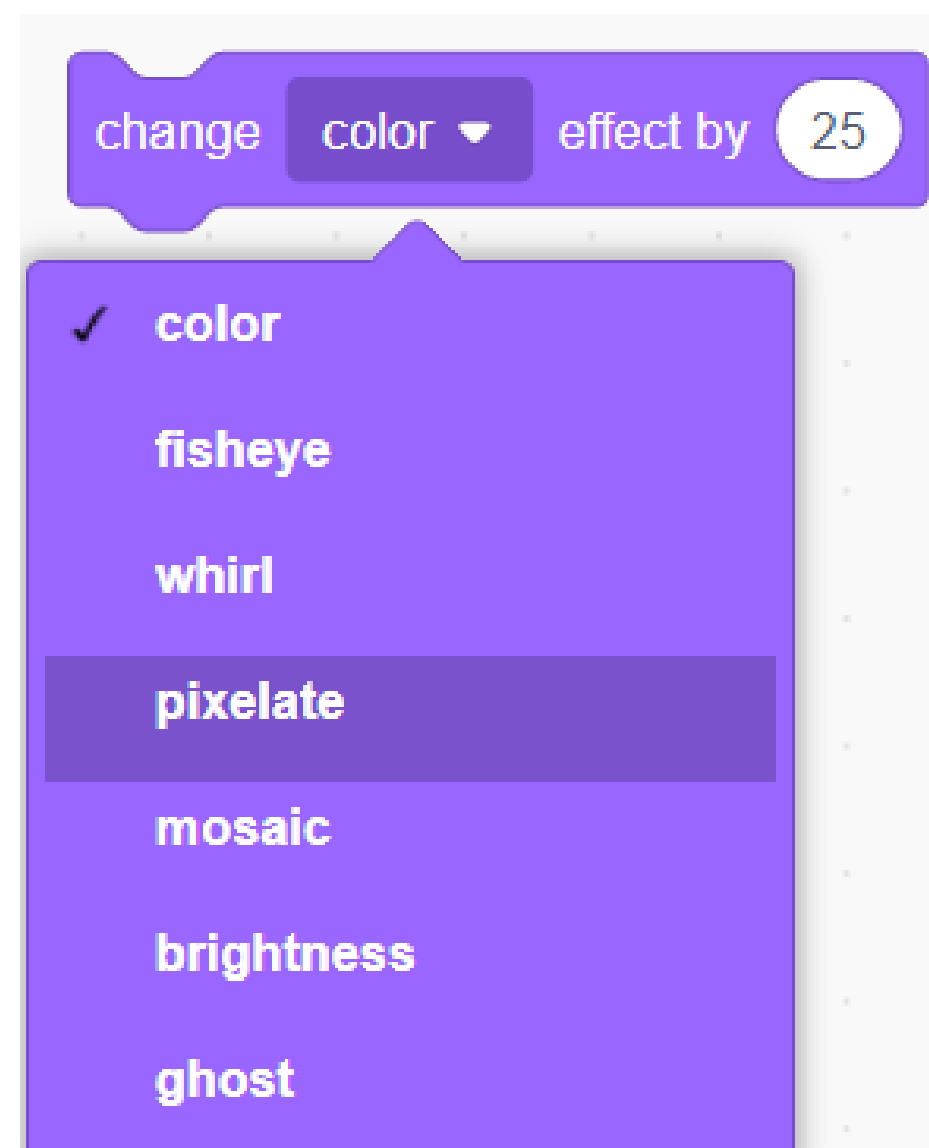
6) Drag  to the script area. Change it to 'pikachu'. Drag  out too.



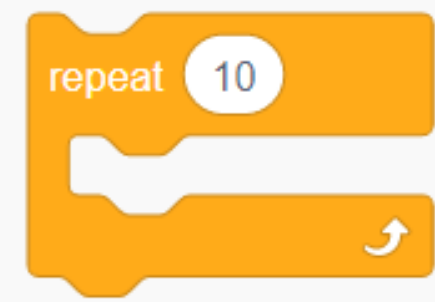
7) Let's add some effects while Pikachu is evolving to Raichu. Drag out the program below



8) Change the effect to 'pixelate' and the value to '2'

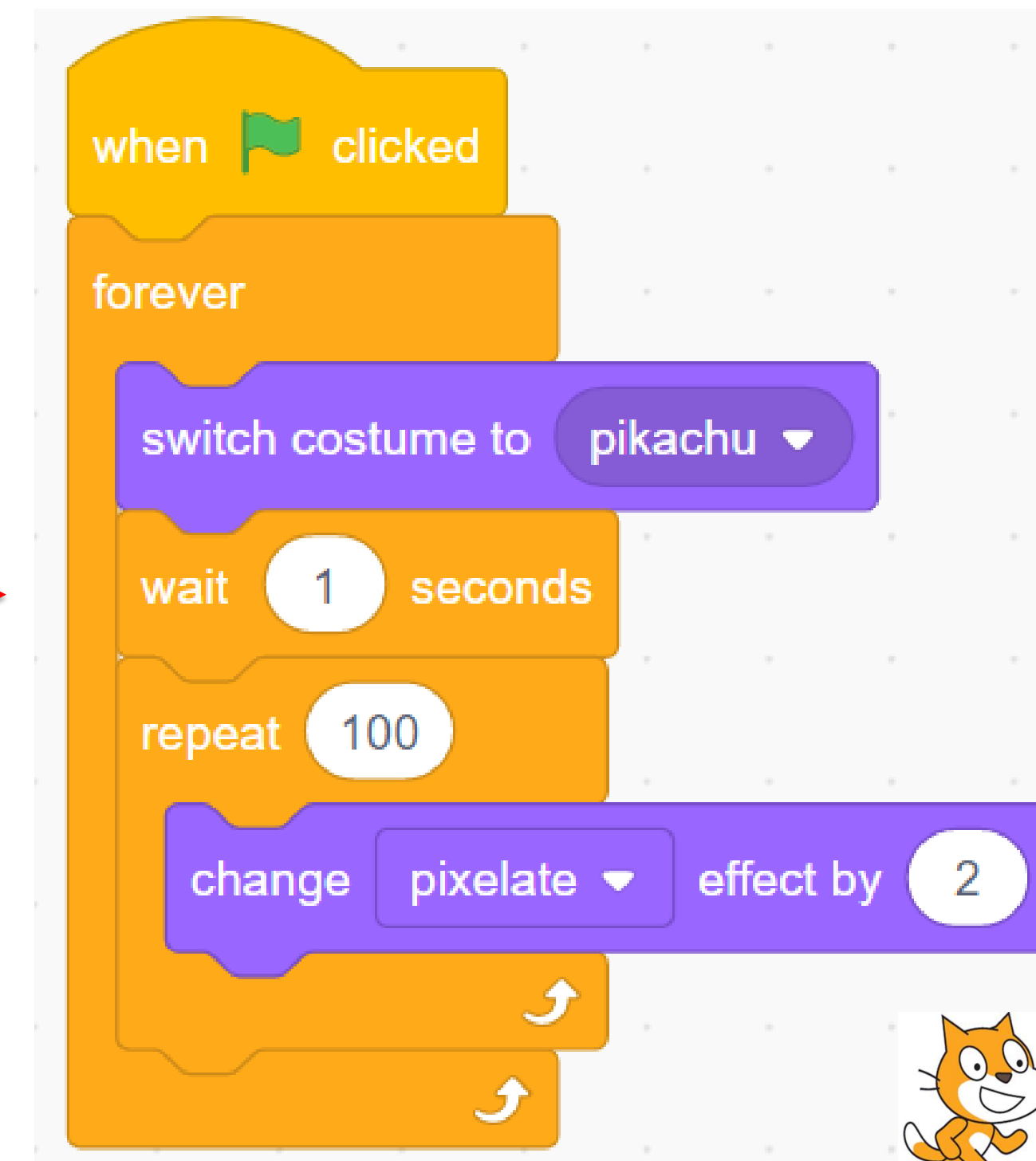


9) To ensure a nice “Ripply” effect, we will use ‘repeat 100 times’

before it changes costume to Raichu. Hence, drag  to script area and change the number to ‘100’.

10) For the animation to go on forever. We will add in 

11) Did you get the same code?



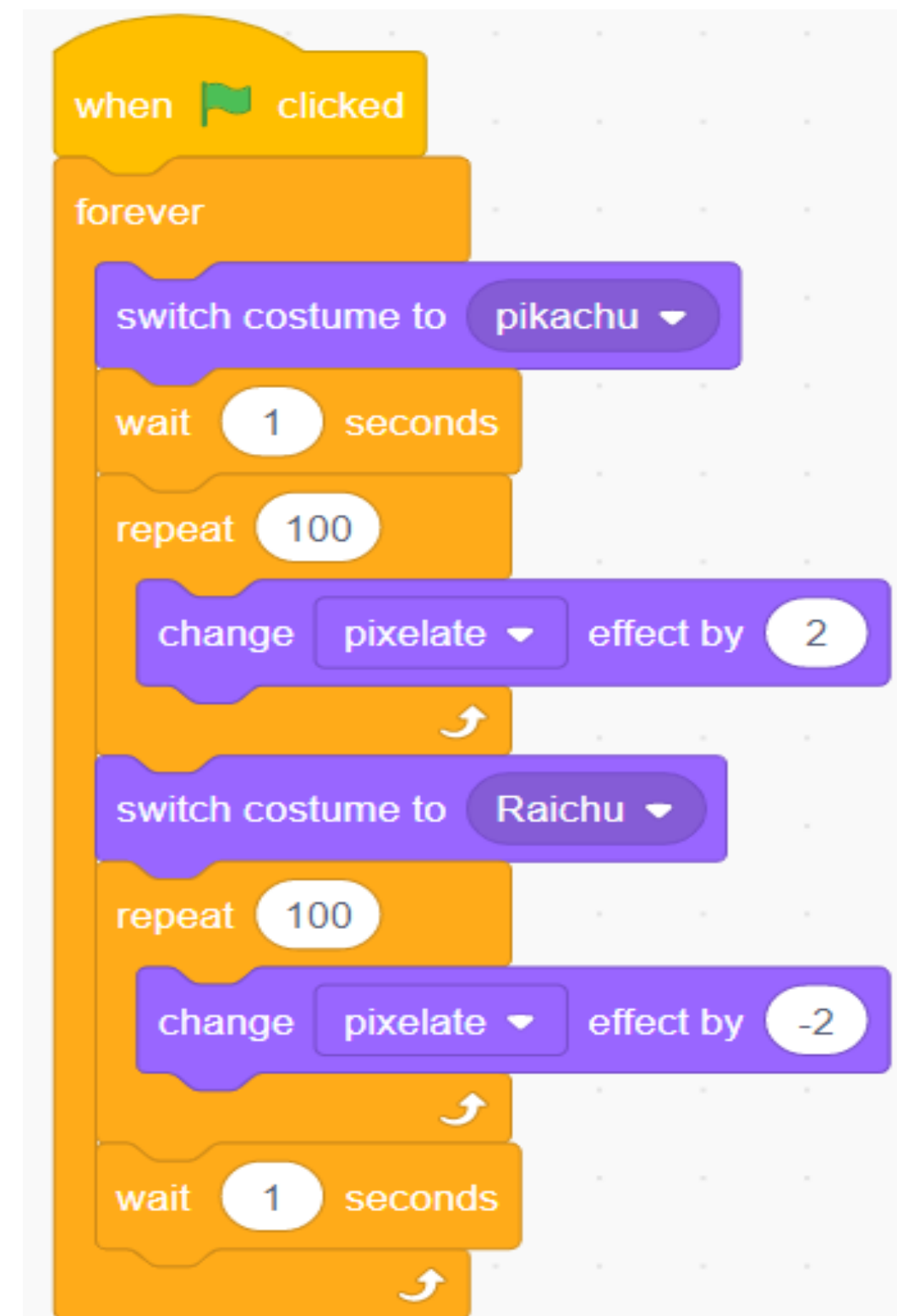
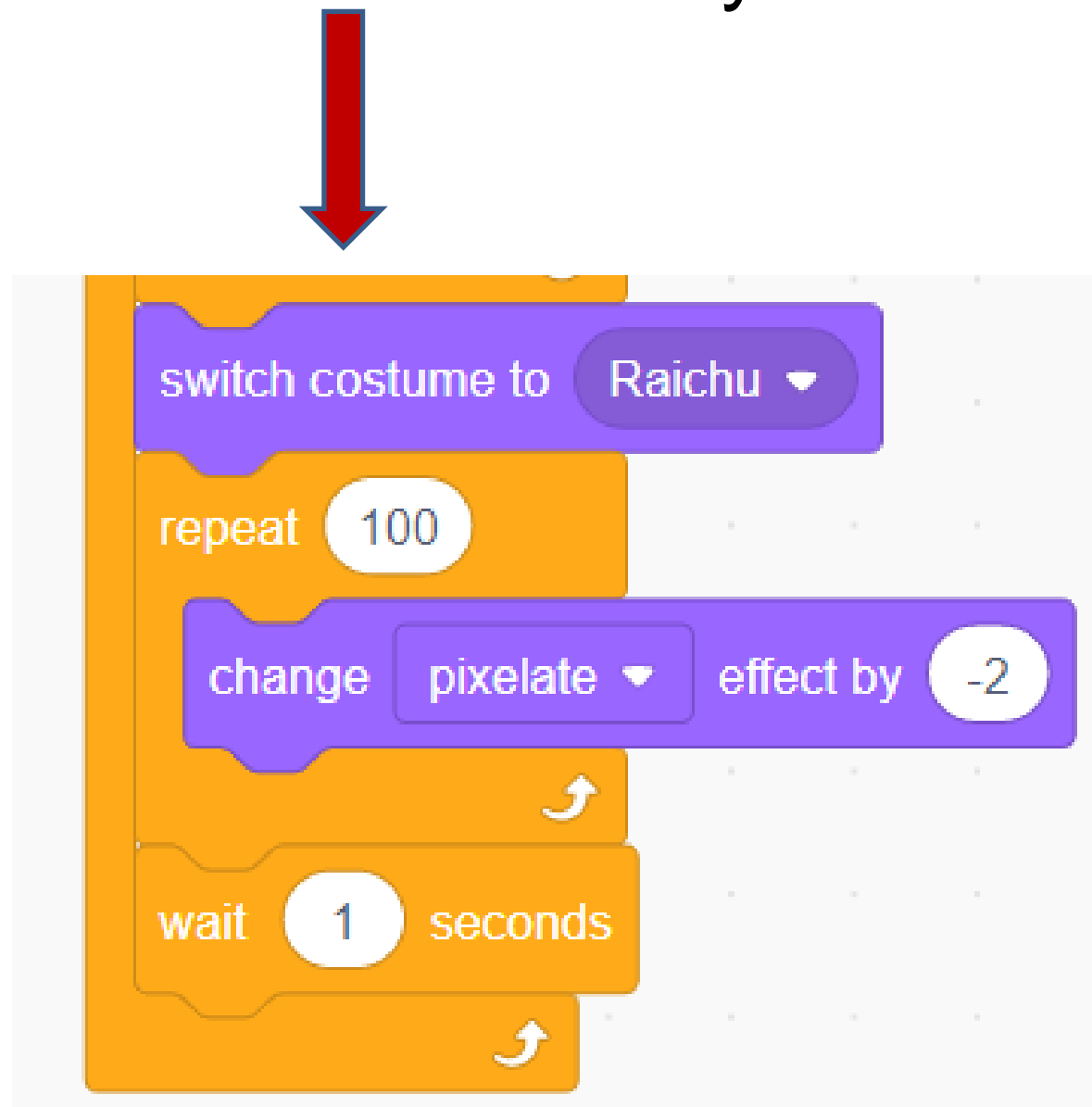


12) Next, after pixelate, Pikachu will slowly change to Raichu

switch costume to Raichu ▼

13) We need to 'repeat 100 times of pixelate at a value of -2' to let Raichu show itself. Add in 'wait 1 sec' to clearly see Raichu before pixelation starts again.

Are you able to do this code yourself?

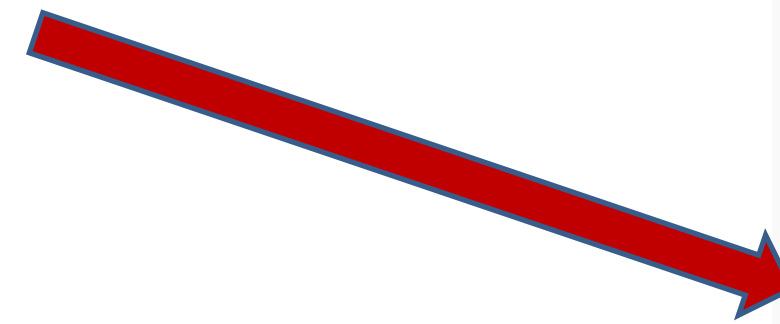


# LESSON 3: POKEMON ANIMATION

14) Next, after pixelation, Raichu should change back to the Sprite. Are you able to do the code yourself?

Trying doing it yourself before you look at the answer.

*(Hint: Do the same first code as you did earlier)*



```
when green flag clicked
  forever loop
    switch costume to pikachu
    wait 1 seconds
    repeat 100
      change pixelate effect by 2
    switch costume to Raichu
    repeat 100
      change pixelate effect by -2
    wait 1 seconds
```



# LESSON 3: ANSWER



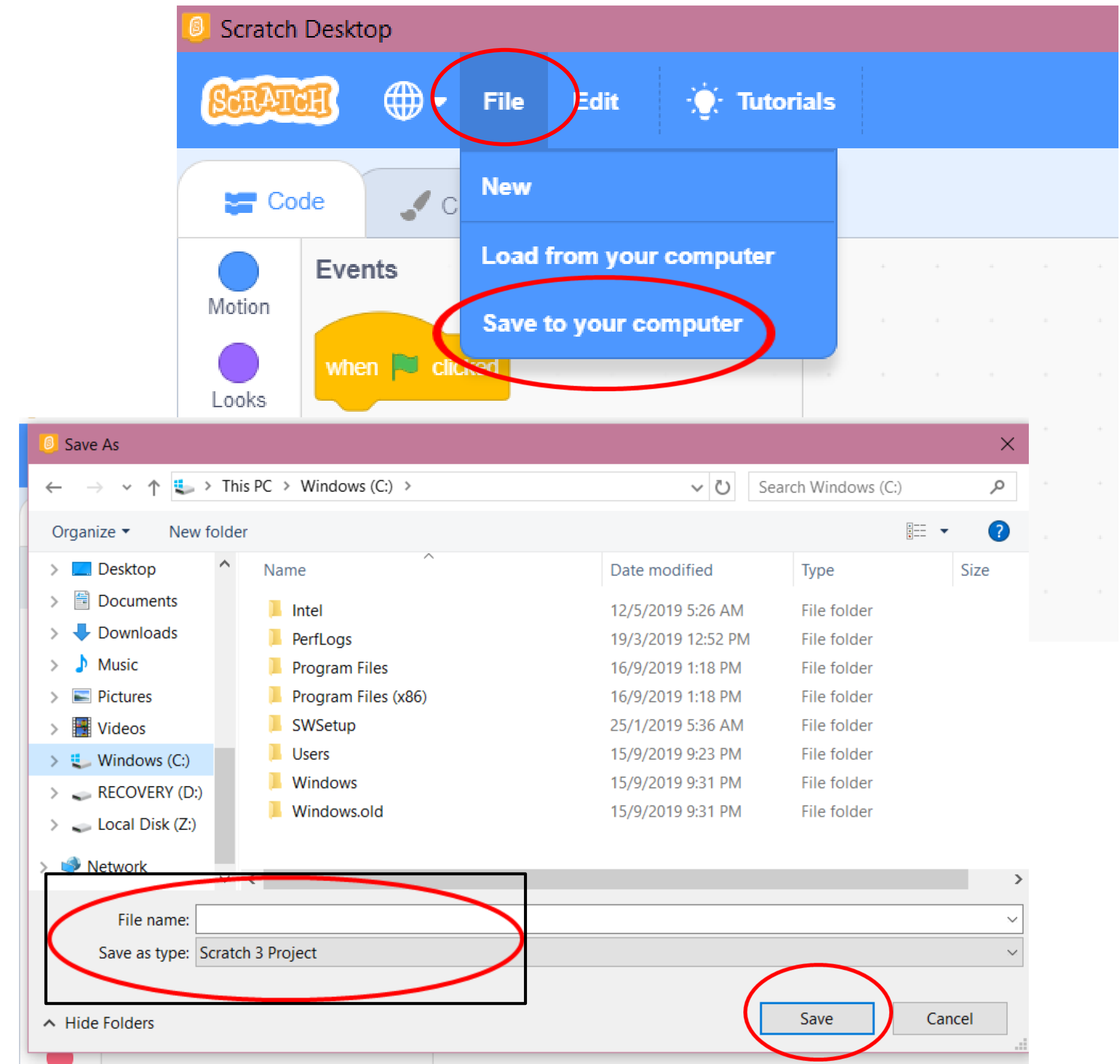
- When you pixelate by 2, you need to un-pixelate by -2 again to see the image.
- A 'wait 1 sec' block is included to slow down the transformation. Play around with the timing and see how fast or slow you want the transformation to be.
- You can also explore the number of times you want the pixelation to be...so try changing the value for the 'repeat' block.
- Try another effect.



# SAVING A PROJECT

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- 2) Click '**Save to your computer**'
- 3) Look for '(D:)' or any other drive or location where you want to save the file
- 4) Under File name 'key in (name of the project that u want )
- 5) Click on '**Save**'
- 6) After you have saved the project, you can clicked 'x' at the top right-hand corner of Scratch to close it.





# LESSON 3: RECAP

What we have learned so far:

- ✓ How to use google to save images so that we can use it as Sprites, costumes and backdrops
- ✓ How to combine different concepts we learned in the first 2 lessons to create a pokemon animation
- ✓ How to use an evolution stone to evolve into a pokemon character and adding sounds to it



## Exercise 1

The beetle will go to the **center of the stage (X:0 Y:0)**

## Exercise 2

Q1) in 

Q2) The Sprite will go to the center of the stage and turn right 90 degrees

## Exercise 3



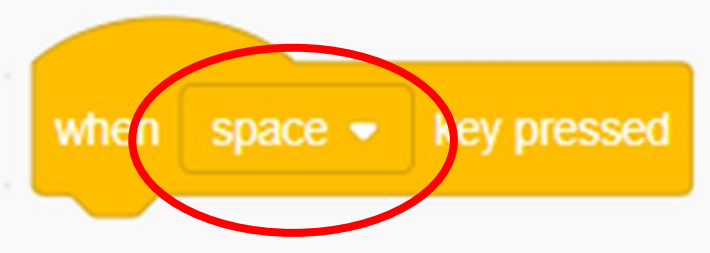

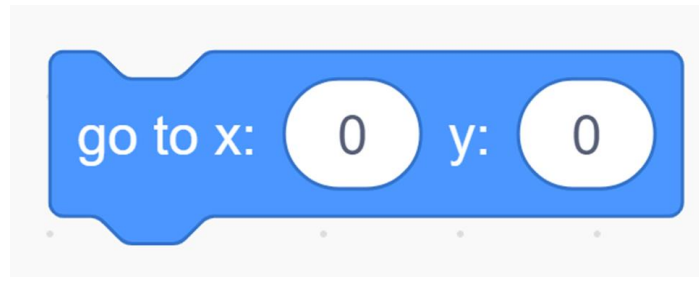

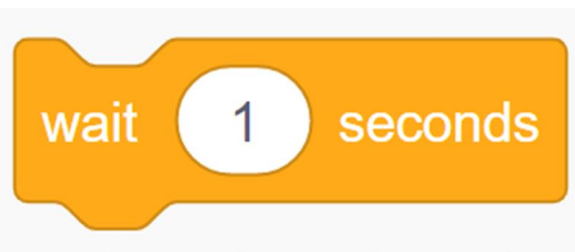

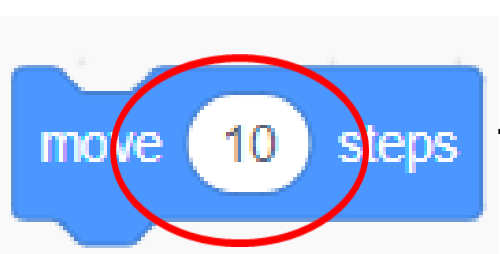
Both 'a' and 'b' start and end at the same location.

'a' – ***teleports*** to the end point

'b' – ***moves 1 step by 1 step*** to the end point


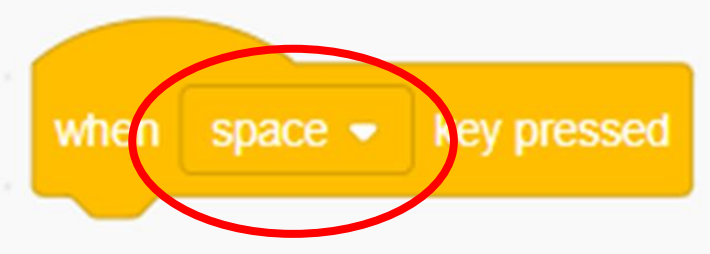

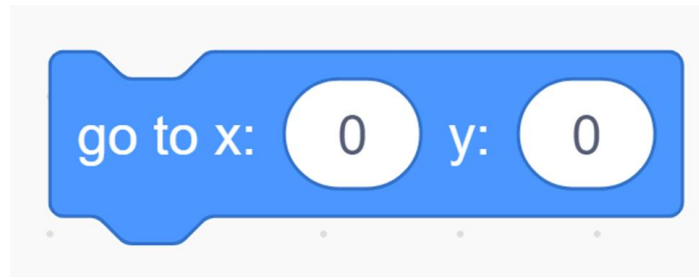

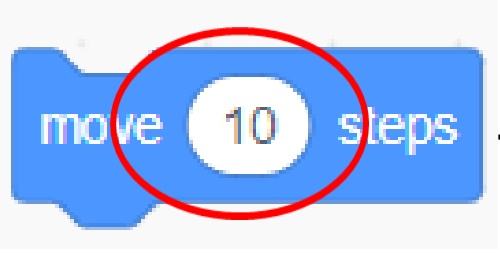


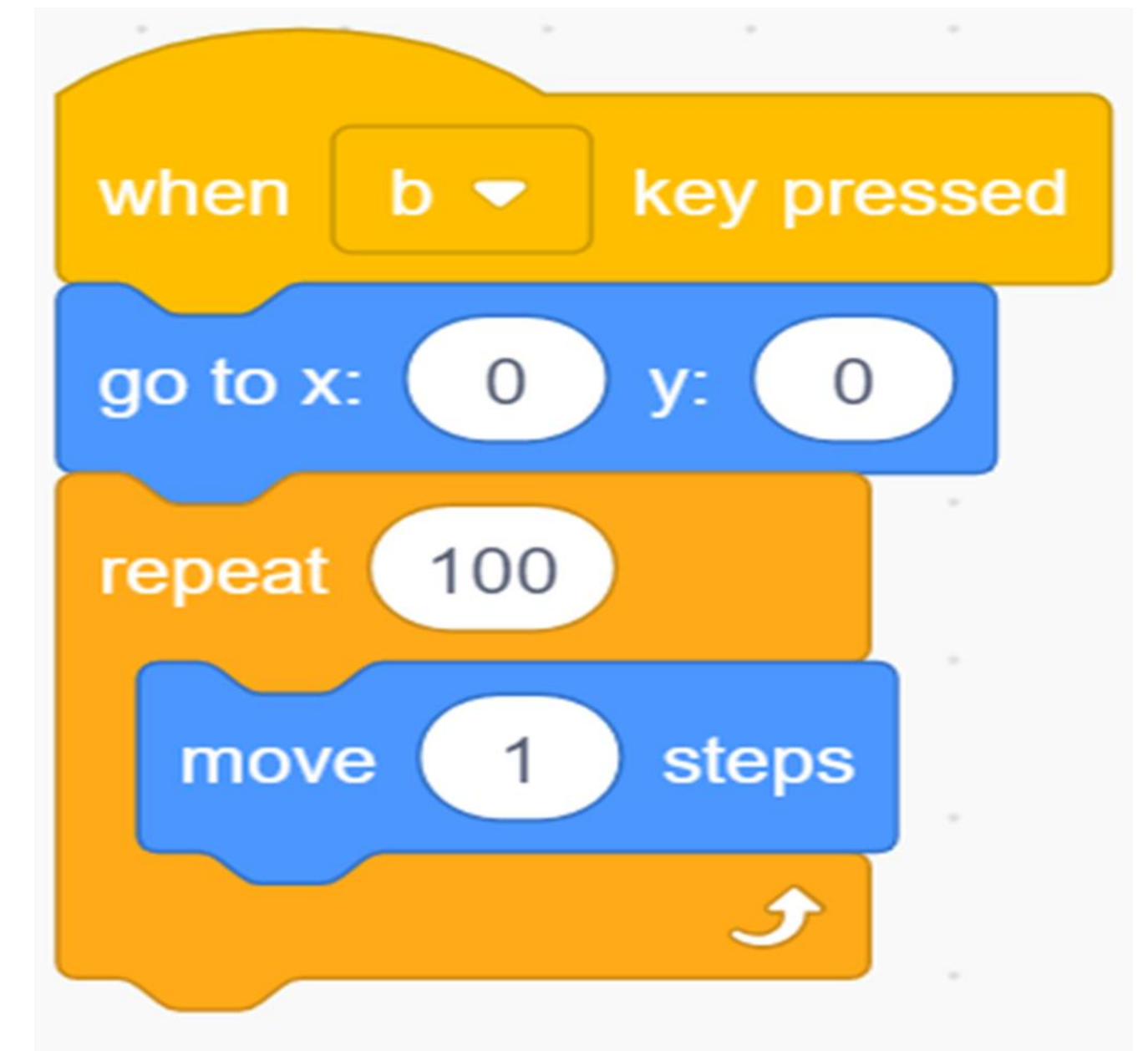
# EXERCISE 3: ANSWERS

1. Go to  and drag  into the script area
2. Click on 'space' to bring down the dropdown menu  and select 'a'
3. Go to  and drag  to the script area
4. Go to  and drag  to the script area
5. Go to  and drag  to the script area. Delete '10' and type '100' in the blank.



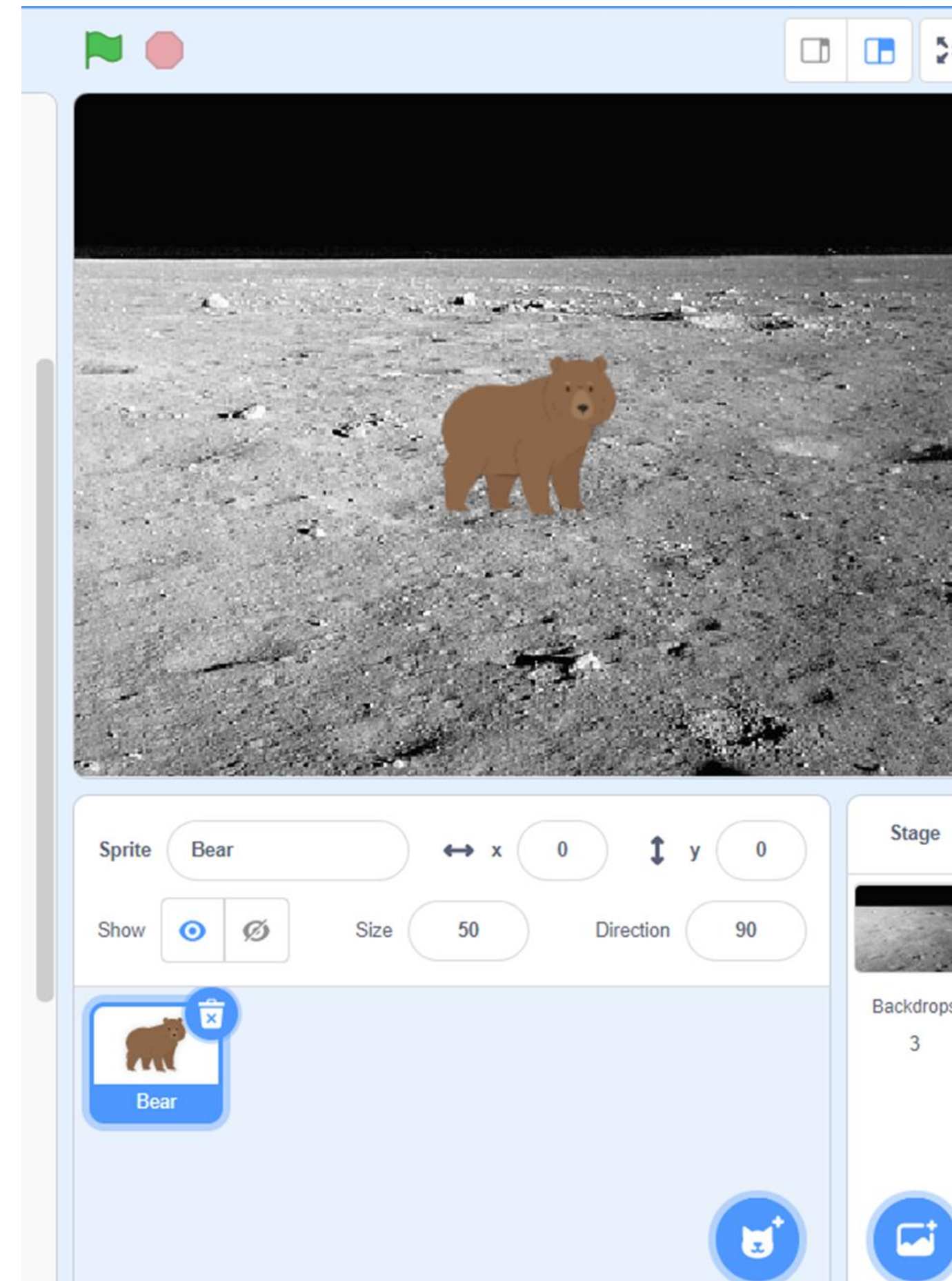
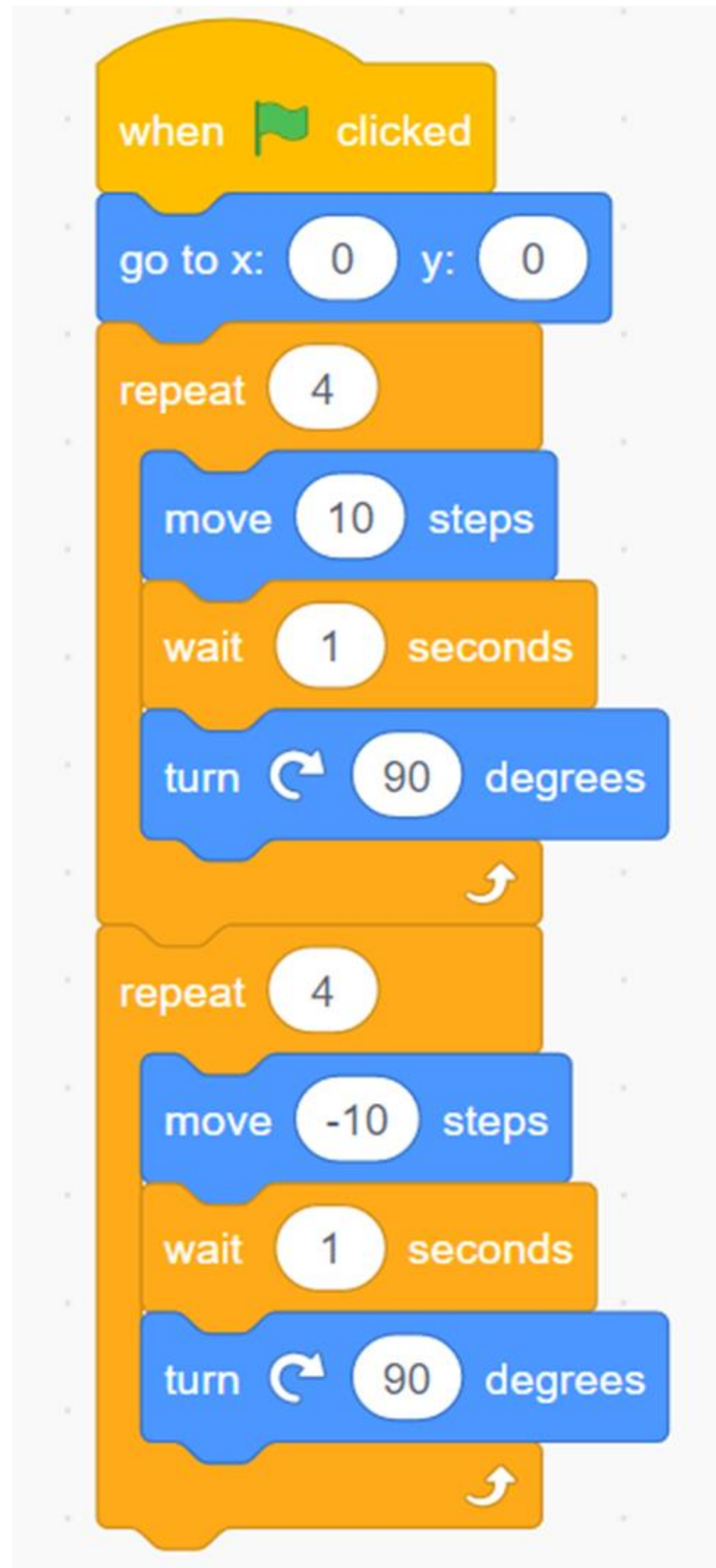
# EXERCISE 3: ANSWERS

1. Go to  and drag  into the script area
2. Click on 'space' to bring down the dropdown menu  and select 'b'
3. Go to  and drag  to the script area
4. Go to  and drag  to the script area. Delete '10' and type '100'
5. Go to  and drag  to the script area. Delete '10' and type '1' in the blank.

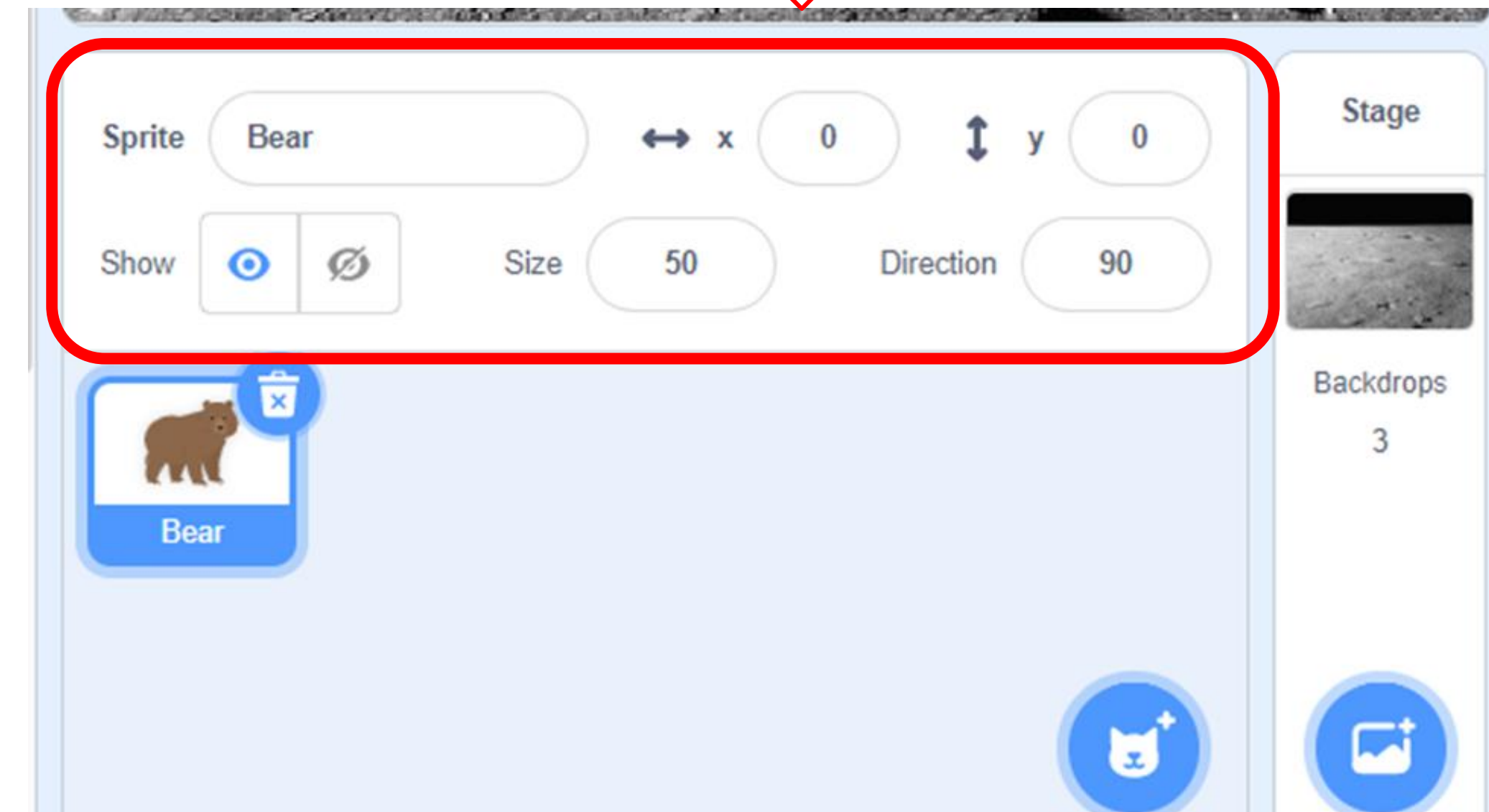




# LESSON 1: CHALLENGE'S ANSWER



These are the information about the Sprite. Hence, u can edit the name of the Sprite, can change the size, the x&y and the direction the Sprite is facing.



## Exercise 4

Without the wait block, the Sprite will move very fast. The colour effects changes faster too. With the wait block, the Sprite moves and changes colour slower.

## Exercise 5

No specific answer. Explore with the different effects and value and see what happens to the Sprite.

## Exercise 6

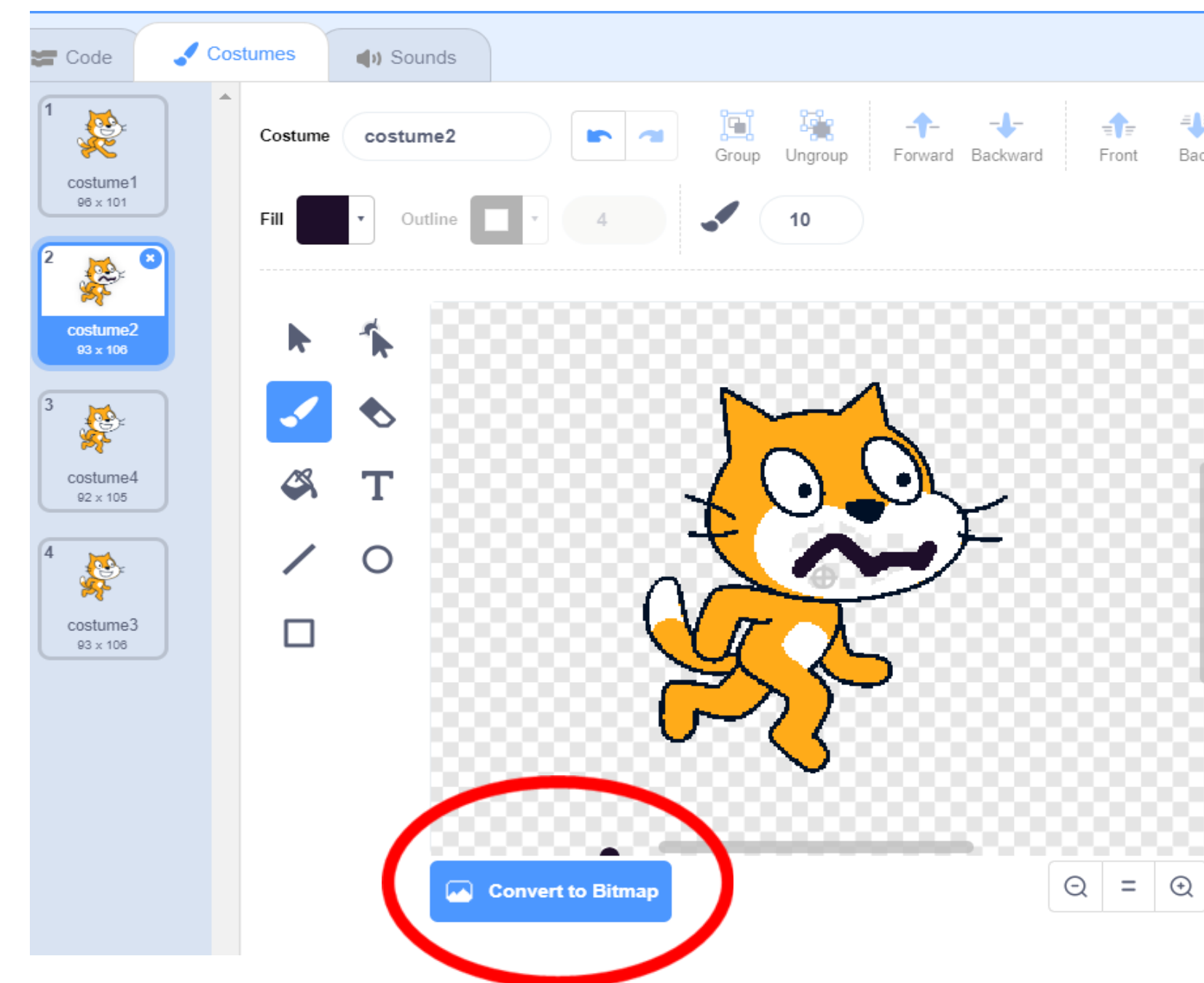
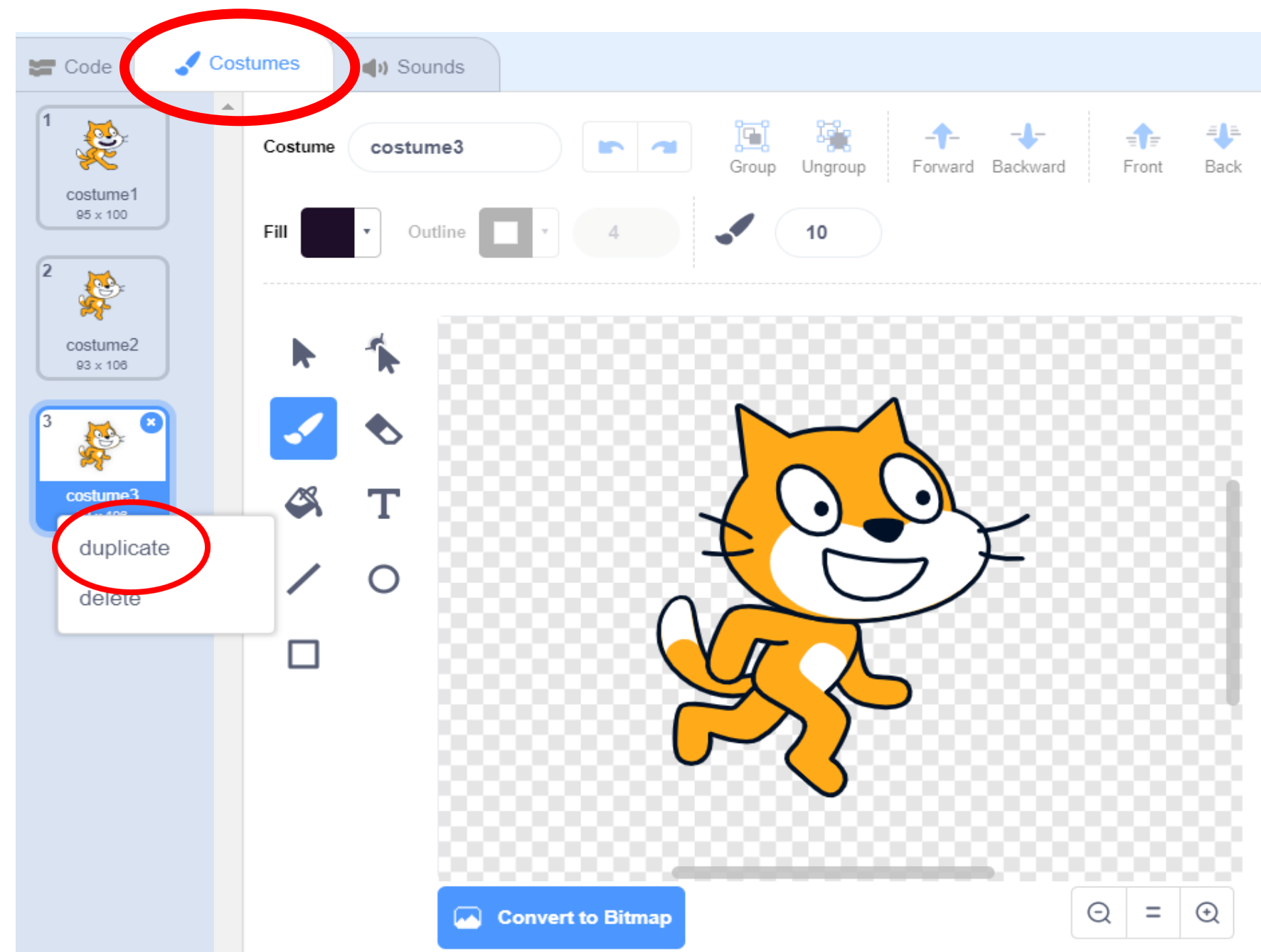
Set the brightness back to default. That means back to the original brightness. By putting the value 0, it reset any effects or animation back to default.





## Creating multiple expressions using costume

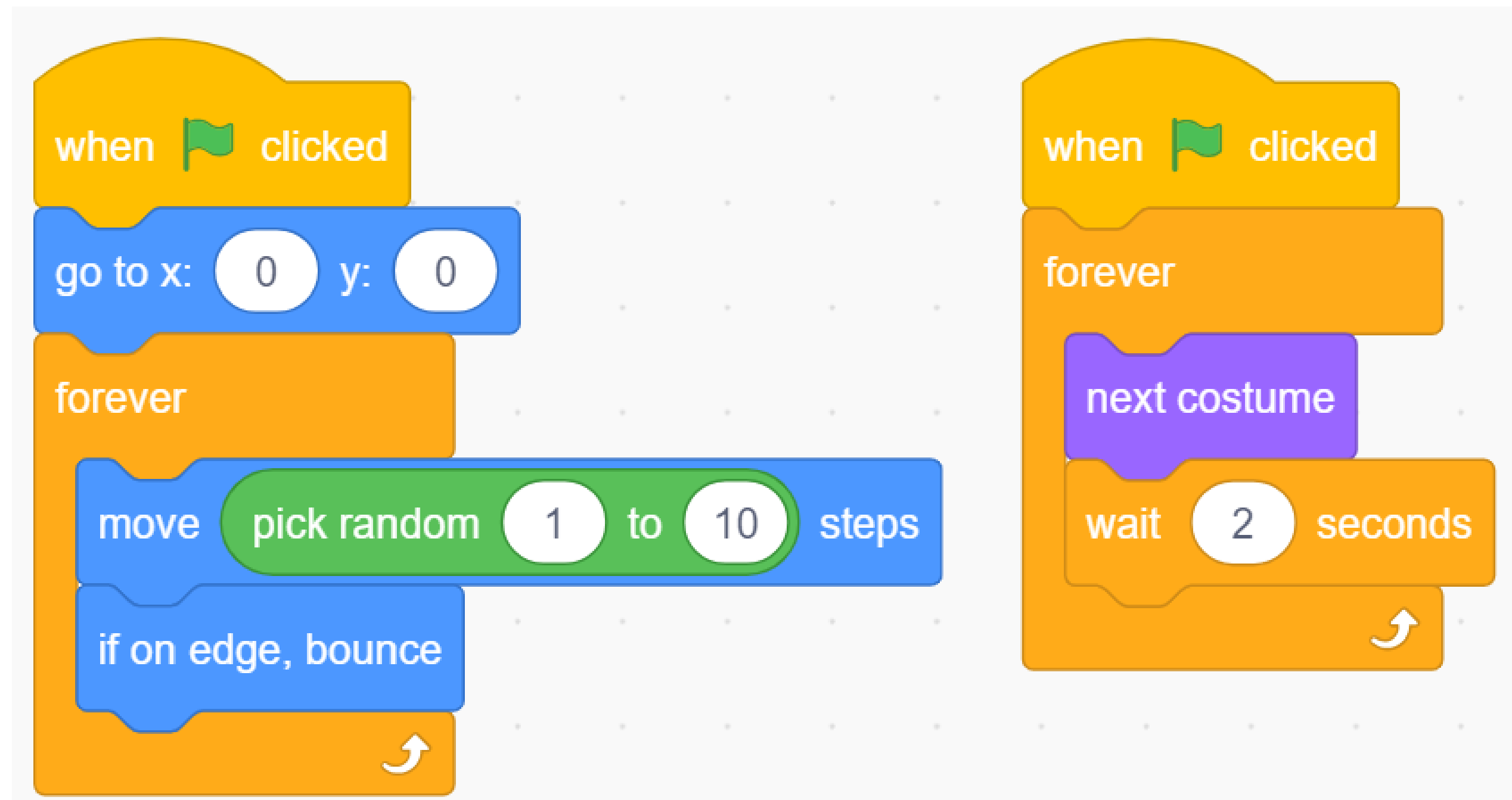
1. Go to 'Costumes' and right-click on one of the costumes and select 'duplicate'. You will have the same costume and u can edit the expression on it.
2. Click 'convert to Bitmap' and edit the costume's expression.



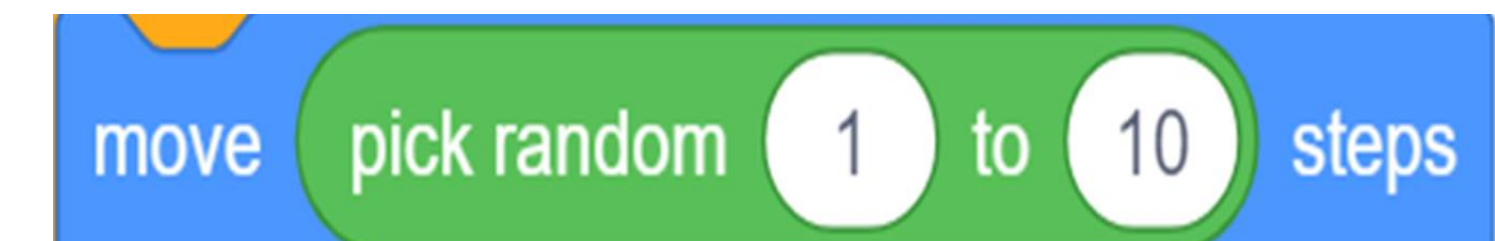


# EXERCISE 7: ANSWER

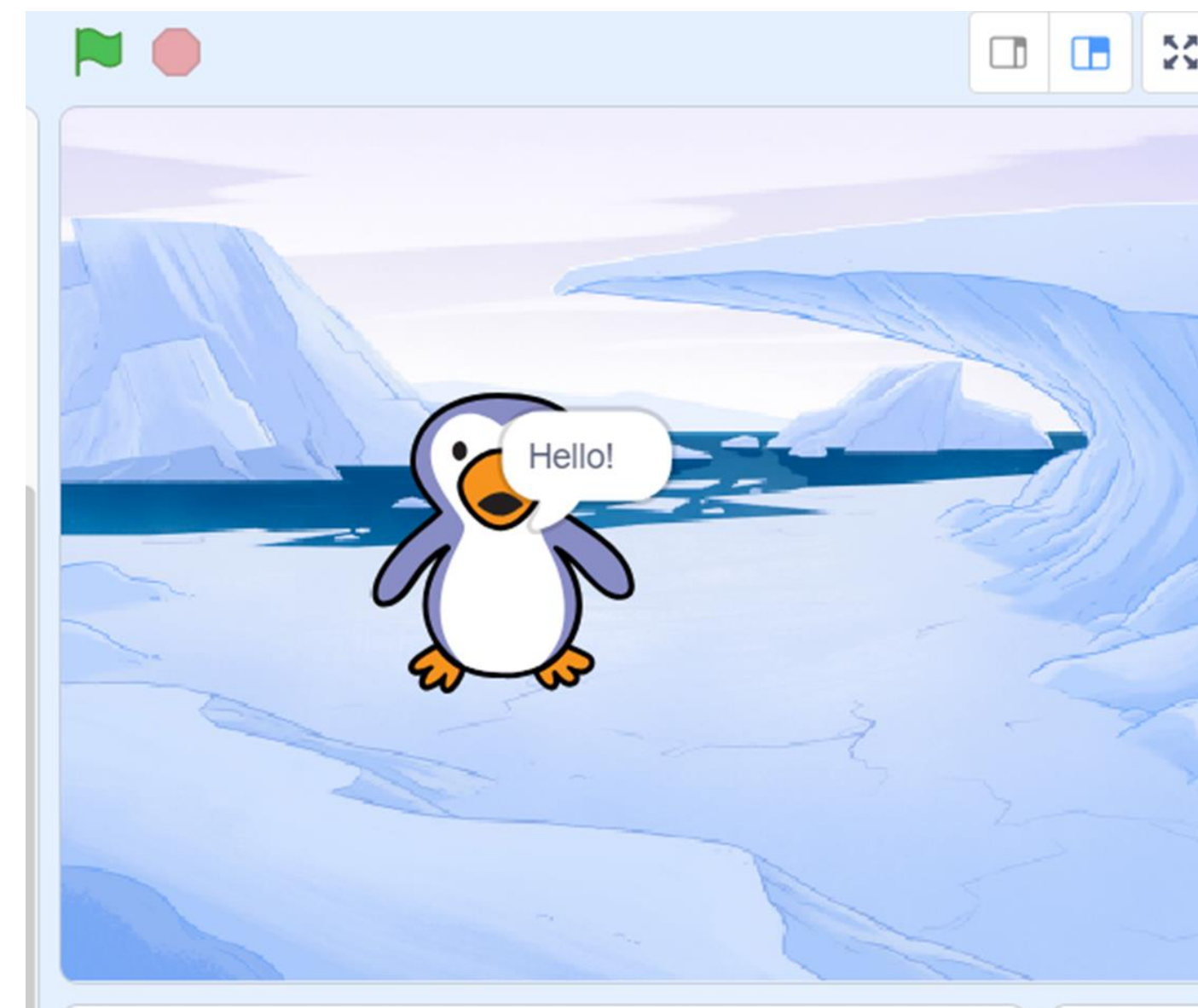
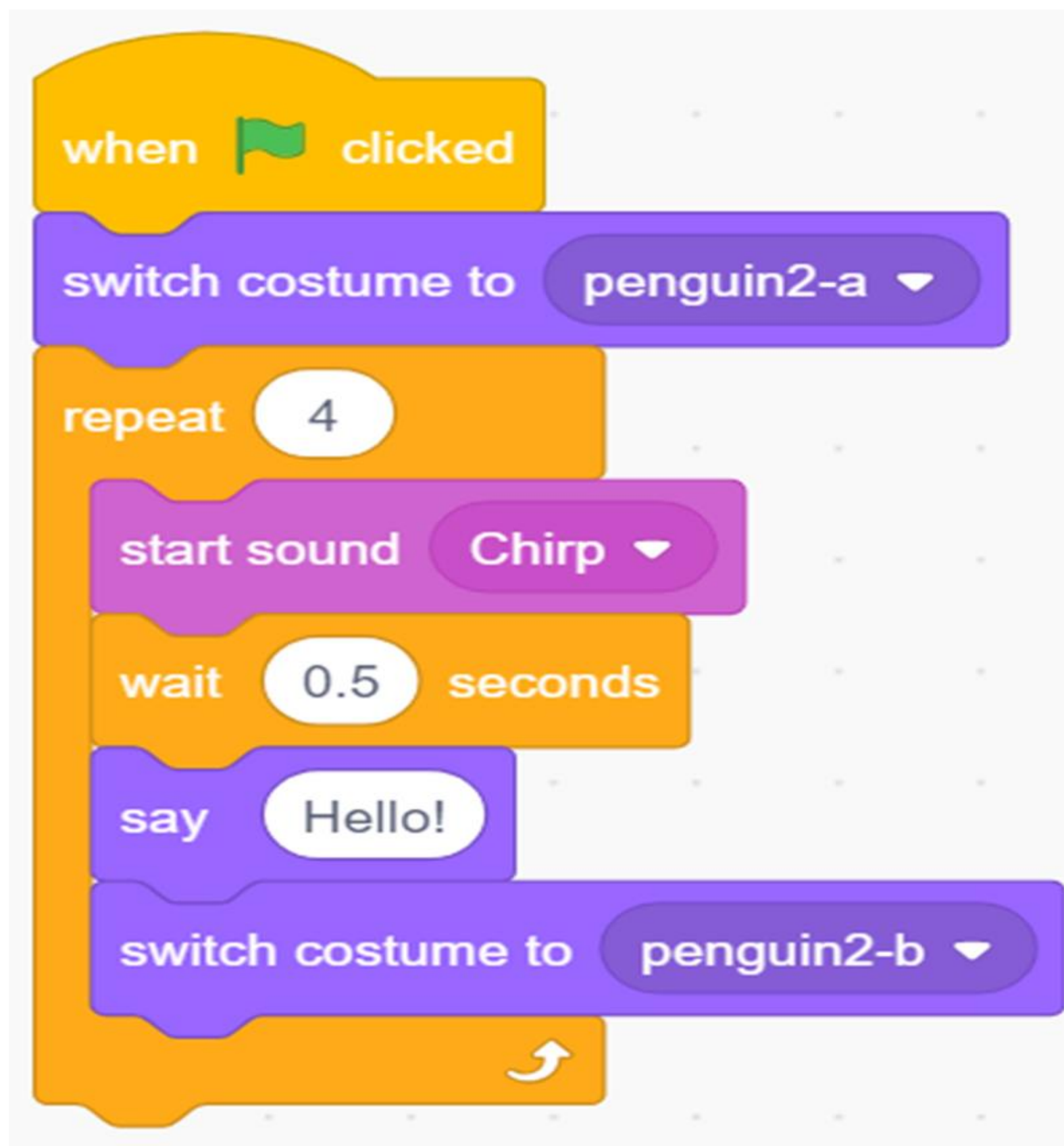
Program your sprite to display a different expression every 2 seconds while moving around the stage.



This block ensures that the sprite will move a random number of steps between “1-10”



# LESSON 2: CHALLENGE'S ANSWER



# LESSON 3: BONUS CHALLENGE

1) Google for pictures of the following:

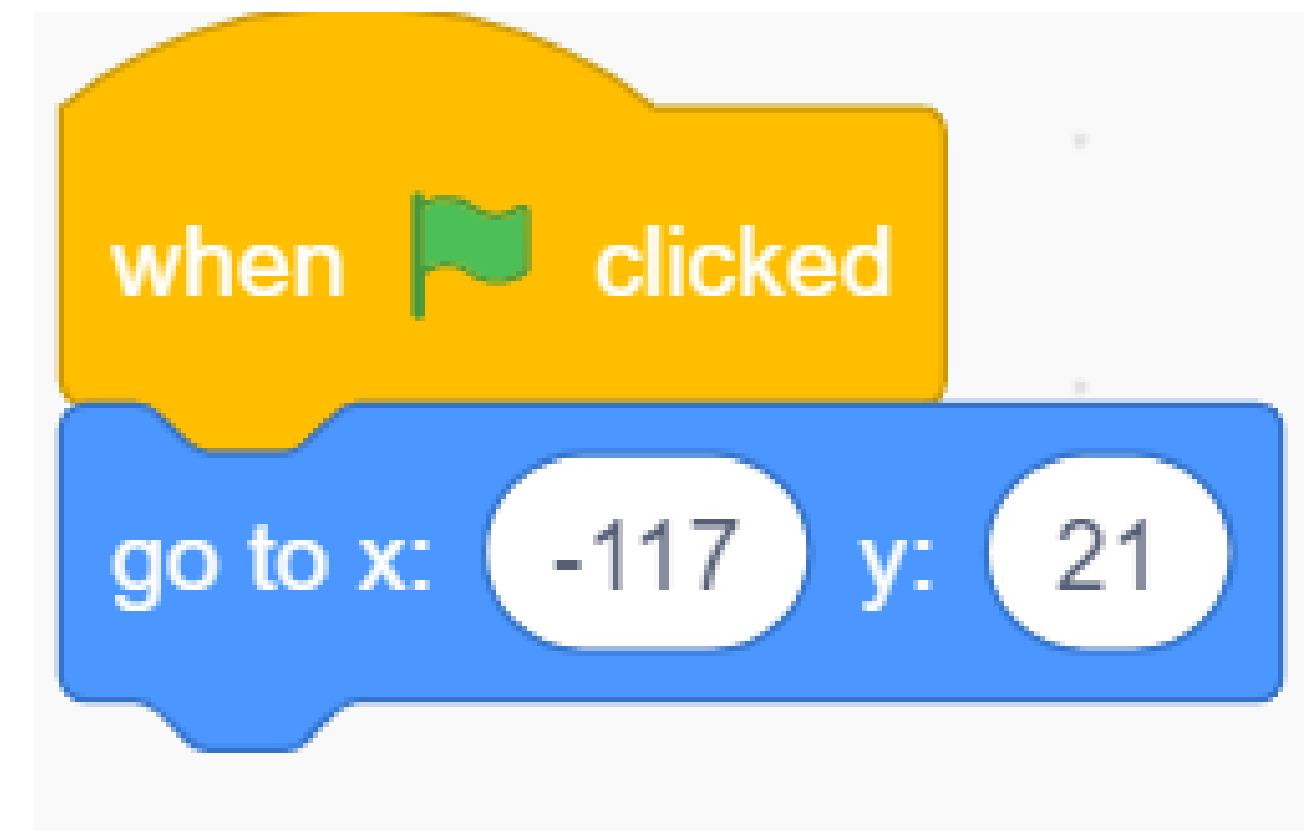
- Evolution stone
- 2 evolution stages of a pokemon  
(e.g pikachu and raichu)

2) You should now have 2 Sprites, an evolution stone and a pokemon.  
(Remember to add both pokemon as a costume)

3) Choose a sound that you like to add in to your code when the costume changes

4) Add effect to your animations

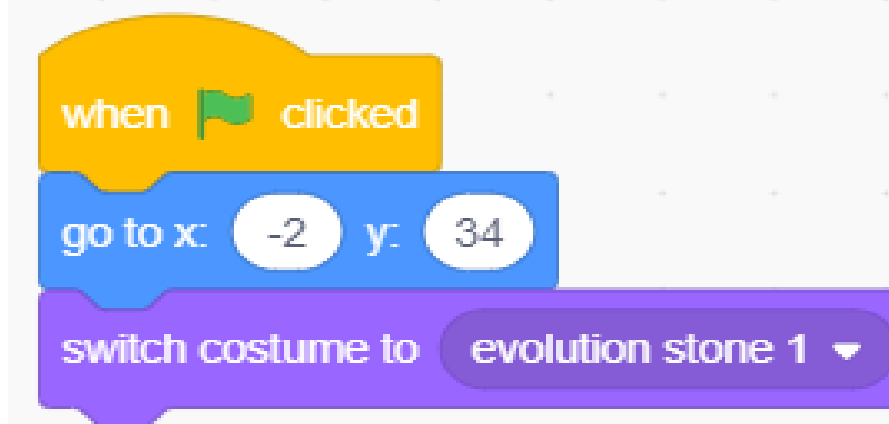
**Sprite 1:**  
**Pokemon (blastoise)**



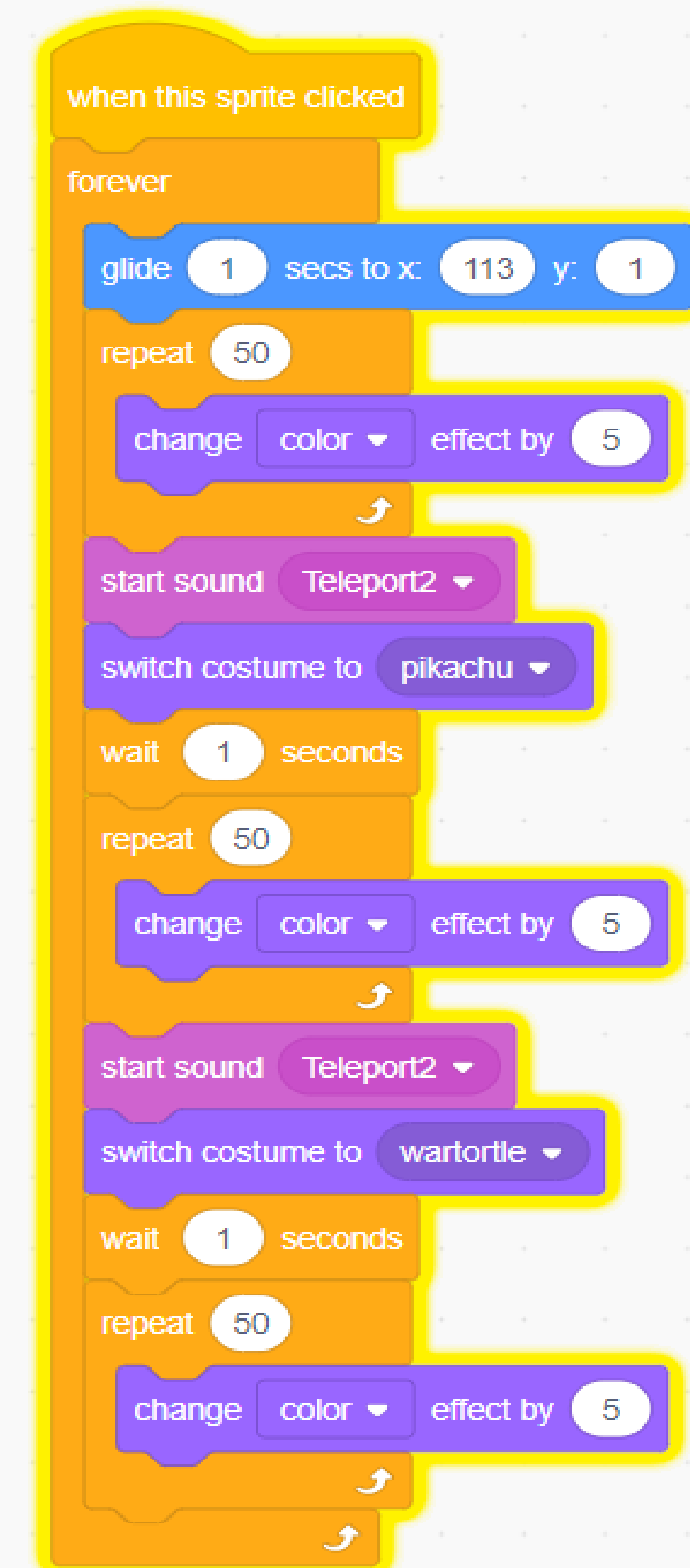


# LESSON 3: BONUS CHALLENGE

- 1) Google for pictures of the following:
  - Evolution stone
  - 2 evolution stages of a pokemon (e.g pikachu and raichu)
- 2) You should now have 2 Sprites, an evolution stone and a pokemon. (Remember to add both pokemon as a costume)
- 3) Choose a sound that you like to add in to your code when the costume changes
- 4) Let your evolution stone glide to a location so that it can change costume to a pokemon
- 5) Add effect to your animations

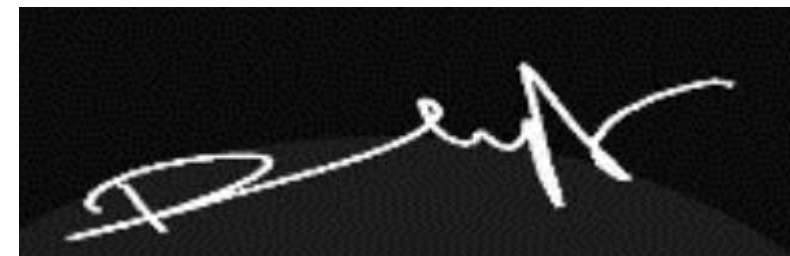


## Sprite 2: Evolution Stone



# Credits

This content was done by



Roselyn Tan  
Trainer  
Graphite Academy



Graphite Academy

70



## GET IN TOUCH



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