



Scratch Programming

Topic 1.1

Introduction

Presented by Advaspire Team



Today's Topic

1. What is Scratch?
2. Why learn Scratch Programming?
3. Create an account for Scratch
4. Scratch User Interface
5. Make the cat move in square



Learning Outcome

- 1. Able to create a new account for Scratch**
- 2. Able to do basic program in Scratch**
- 3. Understand and drag command in Scratch programming environment**



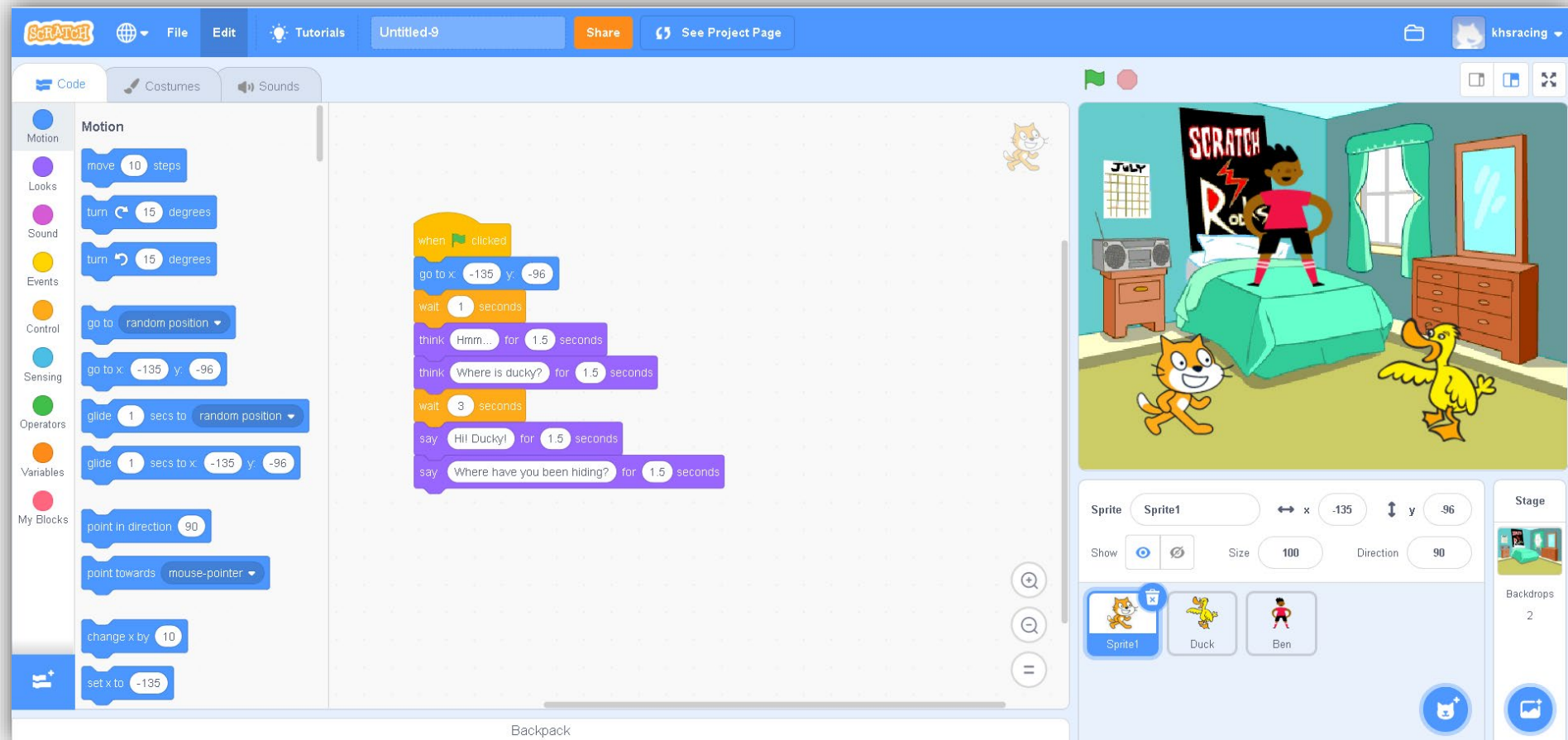
What is Scratch Programming?

SCRATCH





Scratch → Create Animation, Game, interactive stories, etc...



Backpack

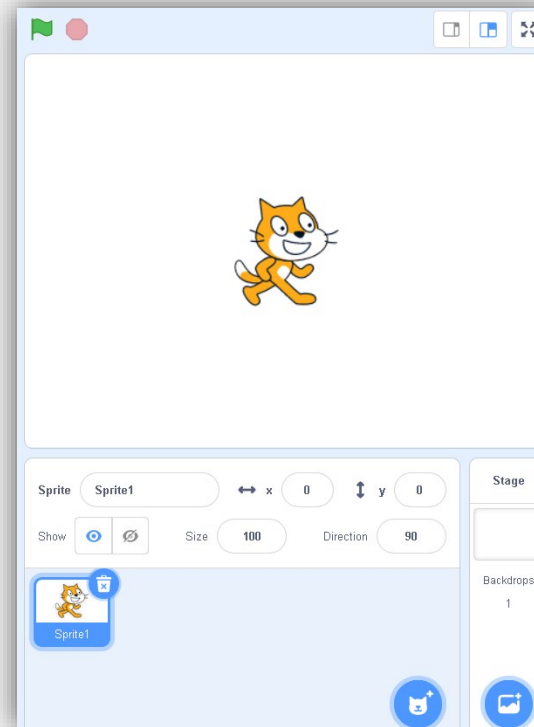
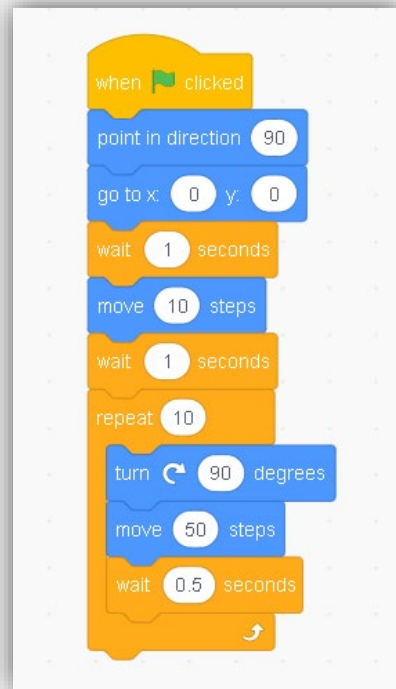
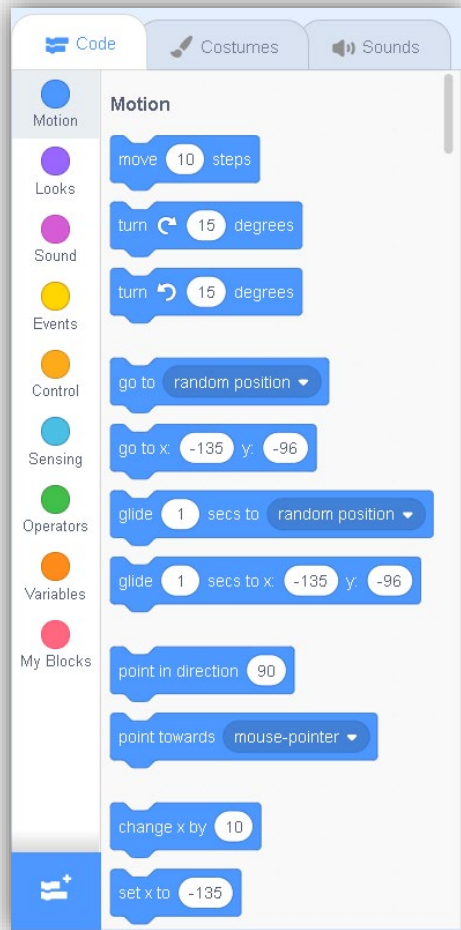


Why learn Scratch Programming?





Why learn Scratch Programming?

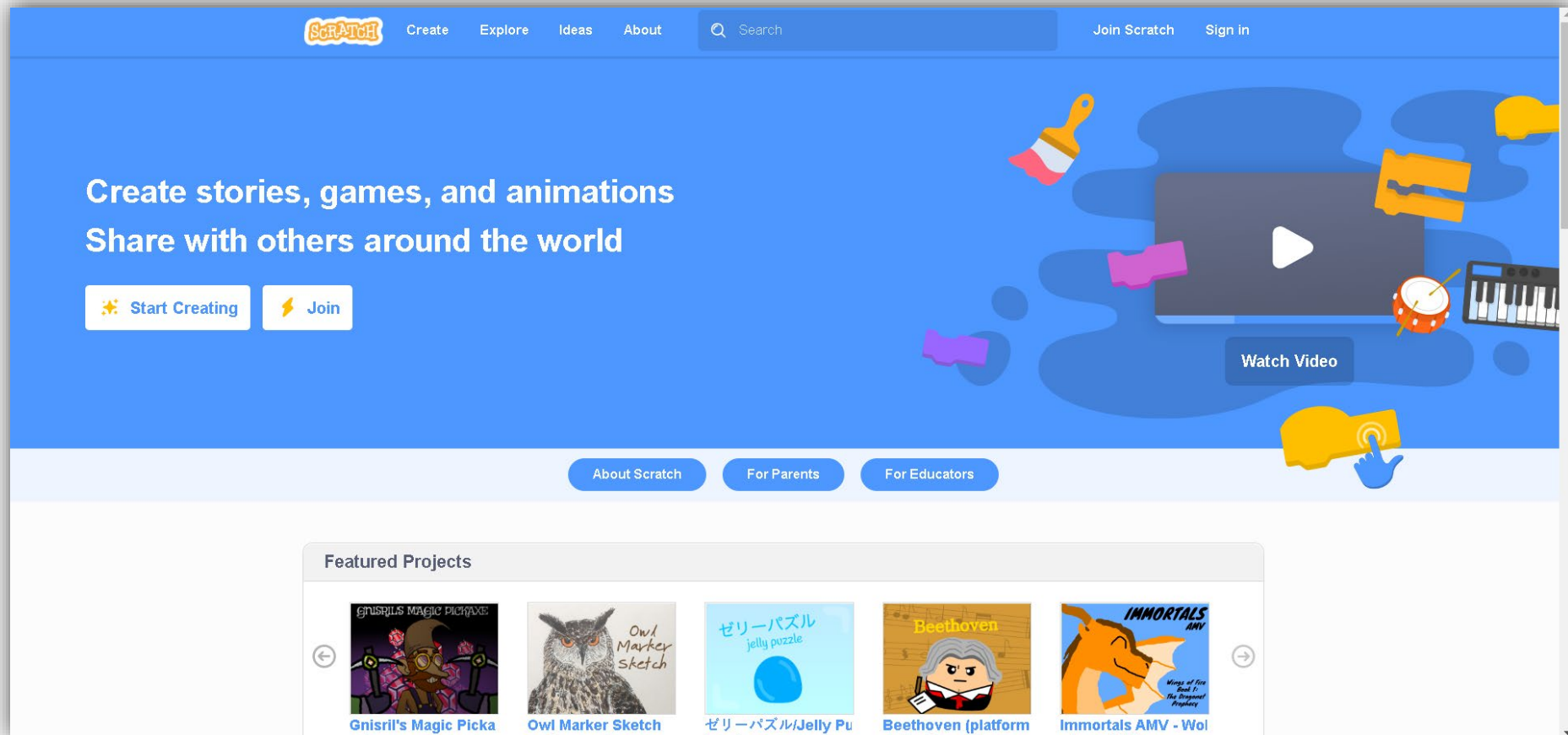


Scratch Programming is:

- >> Totally Free
- >> Easy to learn
- >> Block Programming Style
- >> Free Sprites for download
- >> Free Backdrop for download
- >> Strong Scratch Community
- >> Can explore other people's projects
- >> Coding Starter for Beginner



How to get yourself started?

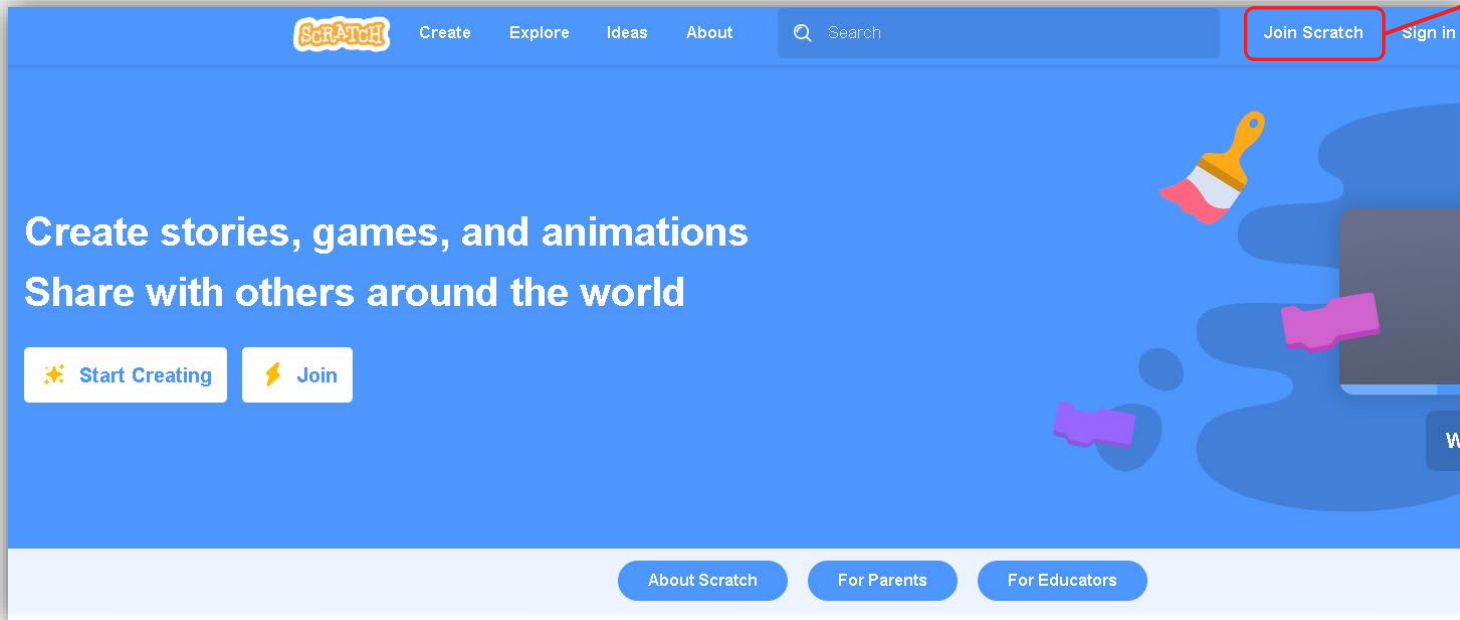


<https://scratch.mit.edu/>

Click or copy this link to your web browser (Google Chrome / Safari / Firefox / Internet Explorer)



How to get yourself started?



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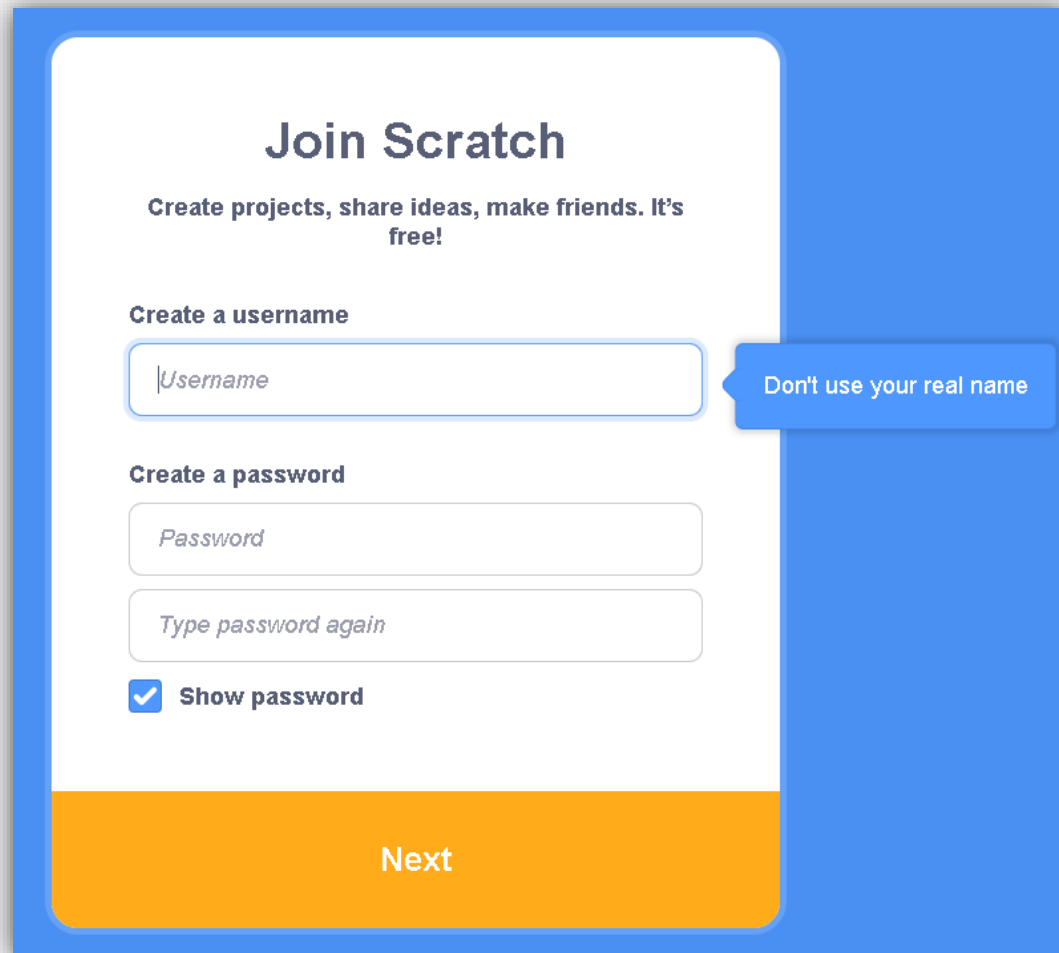
Click “[Join Scratch](#)” to create your own Scratch account.

>> It's very important to have your own Scratch account as you will be required to submit your assignment with your Scratch Account in every lesson.

*If you already have a Scratch account, you can just click sign in and type your username and password to log in to Scratch



How to get yourself started?



The image shows the Scratch account creation interface. It has a blue background with a white central form area. At the top, it says 'Join Scratch' in bold, followed by 'Create projects, share ideas, make friends. It's free!'. Below this, there's a section 'Create a username' with a text input field containing the placeholder 'Username'. A blue callout bubble points to this field with the text 'Don't use your real name'. Underneath is a 'Create a password' section with two text input fields: the first contains the placeholder 'Password' and the second contains 'Type password again'. Below the password fields is a checkbox labeled 'Show password' which is currently checked. At the bottom of the form is a large orange button labeled 'Next'.

At first, you will need to set up your own account:

1. Create a username

It's not recommended to use your real name

2. Create your password

write down on a paper and keep it in your desk in case you forget



How to get yourself started?

What country do you live in?

Select country ▼

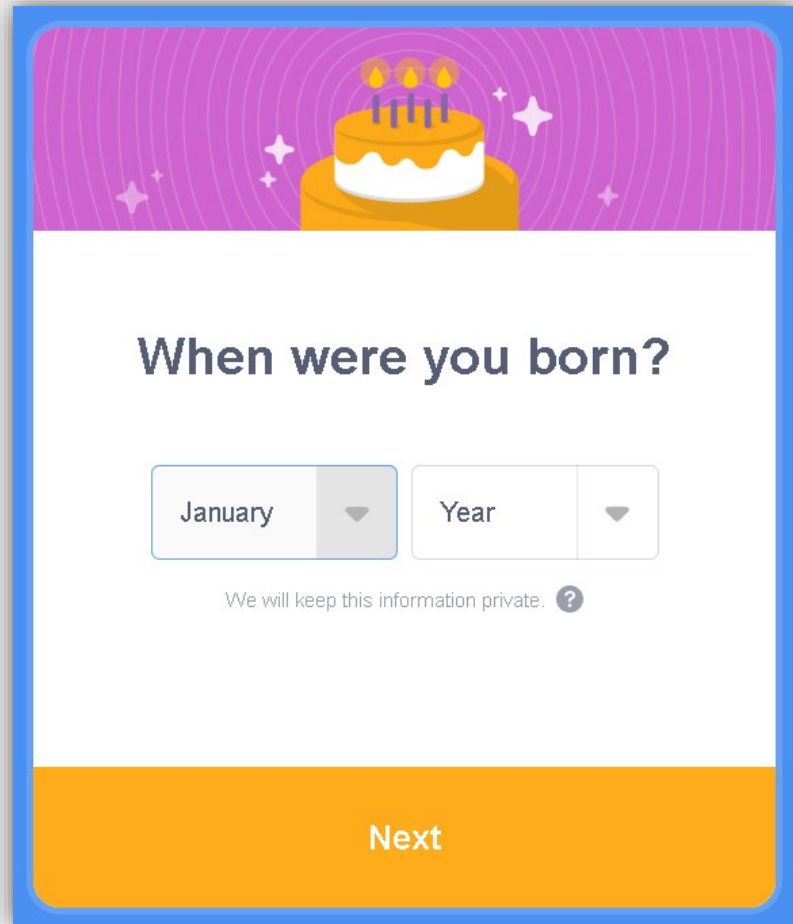
Next

Choose your country:

>> I would choose "Malaysia"



How to get yourself started?



The image shows a Scratch 'When were you born?' dialog box. It has a blue border and a purple header with a birthday cake icon. The main text asks 'When were you born?'. Below this are two dropdown menus: the first is set to 'January' and the second is labeled 'Year'. Below the dropdowns is a privacy notice: 'We will keep this information private.' followed by a question mark icon. At the bottom is an orange 'Next' button.

When were you born?

January Year

We will keep this information private. ?

Next

Select the month and year when you were born.



How to get yourself started?

What's your gender?

Scratch welcomes people of all genders.

☐ Female

☒ Male

☐ Non-binary

☐ Another gender:

☐ Prefer not to say

We will keep this information private. [?](#)

Next

Select your Gender.

>> I will choose male for myself

you can choose prefer not to say if you are not comfortable to disclose your gender



How to get yourself started?

The form is titled "What's your email?". It features a colorful header with a rainbow, clouds, and a white envelope icon. Below the title is a text input field with the placeholder "Email address". To the right of the input field is an orange button labeled "Required". Below the input field, there is a line of text: "We will keep this information private." followed by a question mark icon. Below this is a checkbox with the text "I'd like to receive emails from the Scratch Team about project ideas, events, and more." At the bottom of the form, there is a blue bar with the text "By creating an account, you acknowledge the [Privacy Policy](#) and you accept and agree to the [Terms of Use](#)". Below the blue bar is a large orange button labeled "Create Your Account".

At last, you will need to type in your email address, then click "Create Your Account".

you can use your school's email (edu account) to register

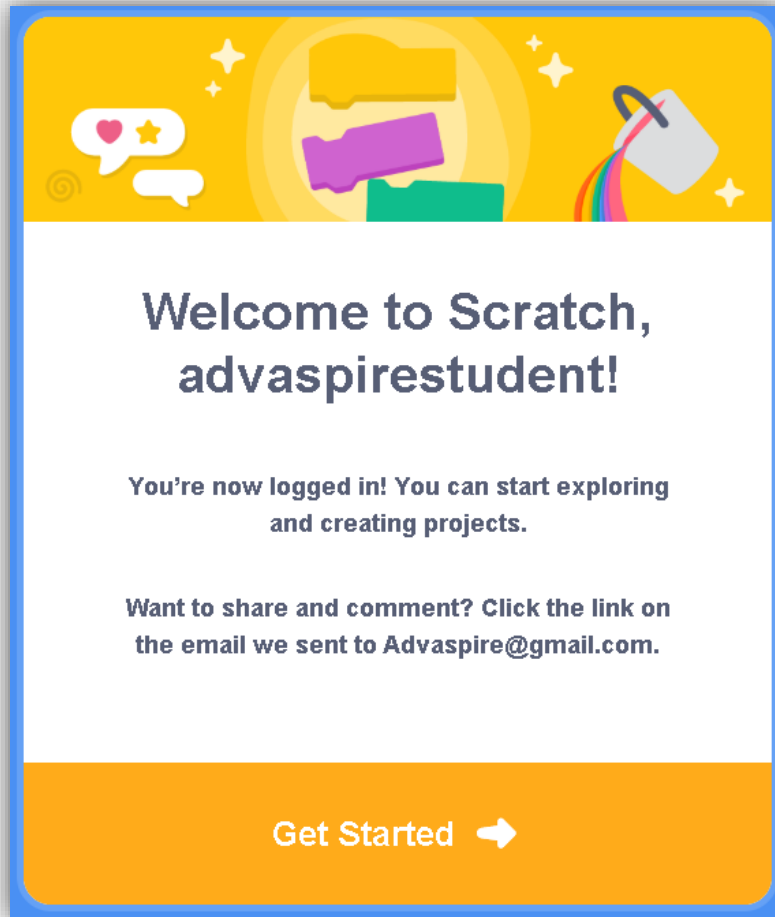
If you do not have email address, please request help from your parents.

After creating your Scratch account, you have to go to your email to check and verify your account to gain the "share project" permission from Scratch.

In each lesson, you are required to submit your assignment by sharing your project and send the link to your teacher



How to get yourself started?



After everything's done, your account is set up successfully.

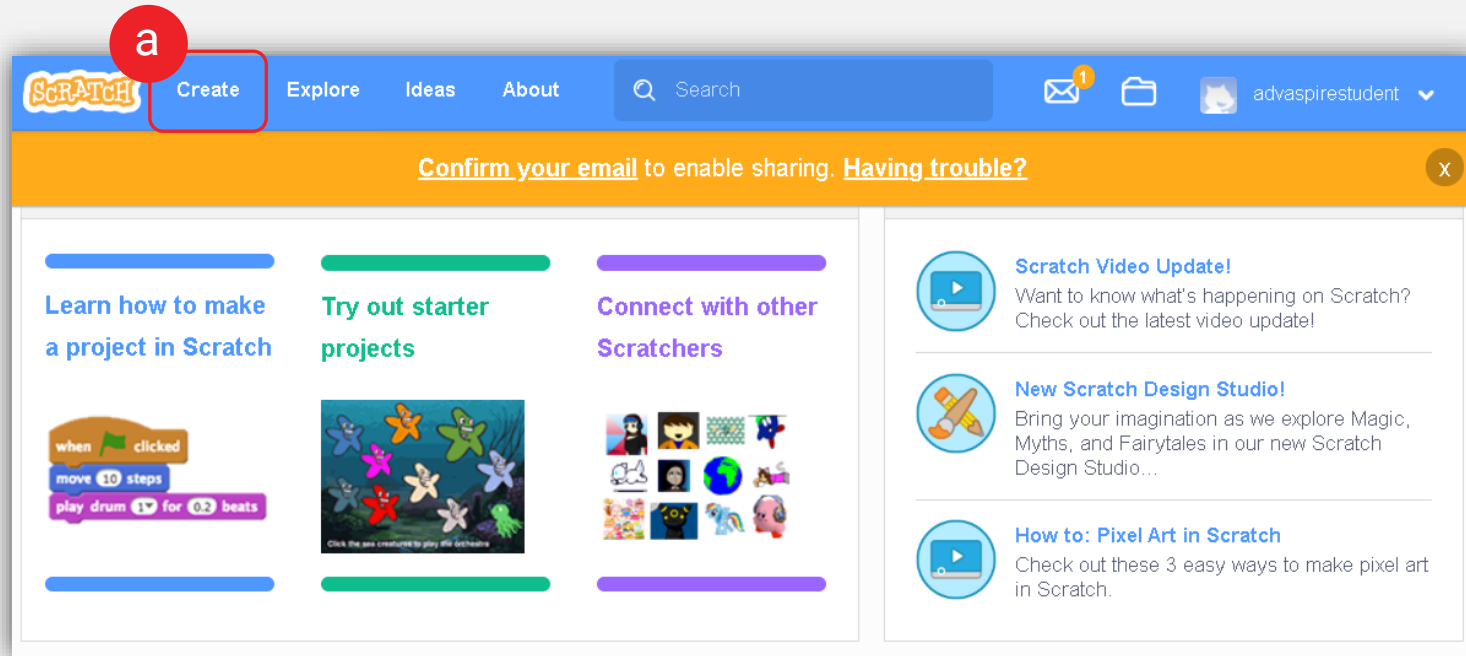
Click "[Get Started](#)" to start programming with Scratch.

Remember to check your email and confirm verification

Only verified account can share the project



Start Creating your Project



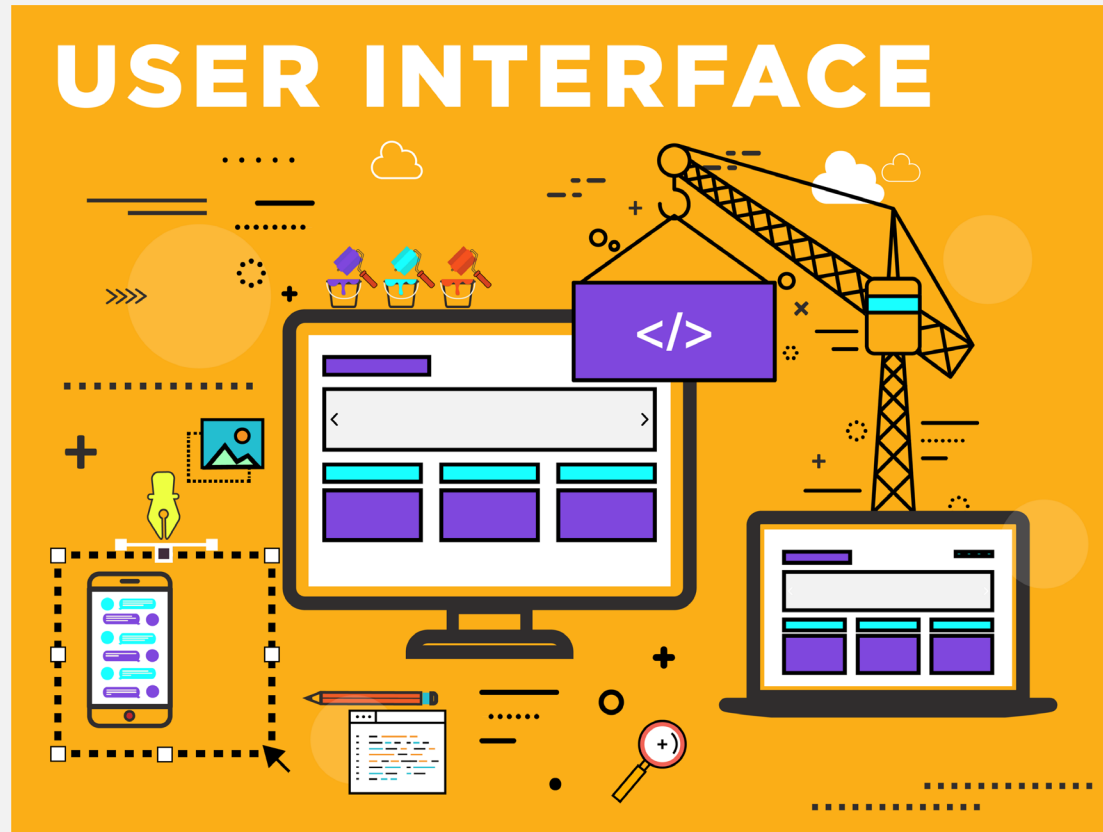
a

Logged back to your account.

Click “Create” to start your new project.

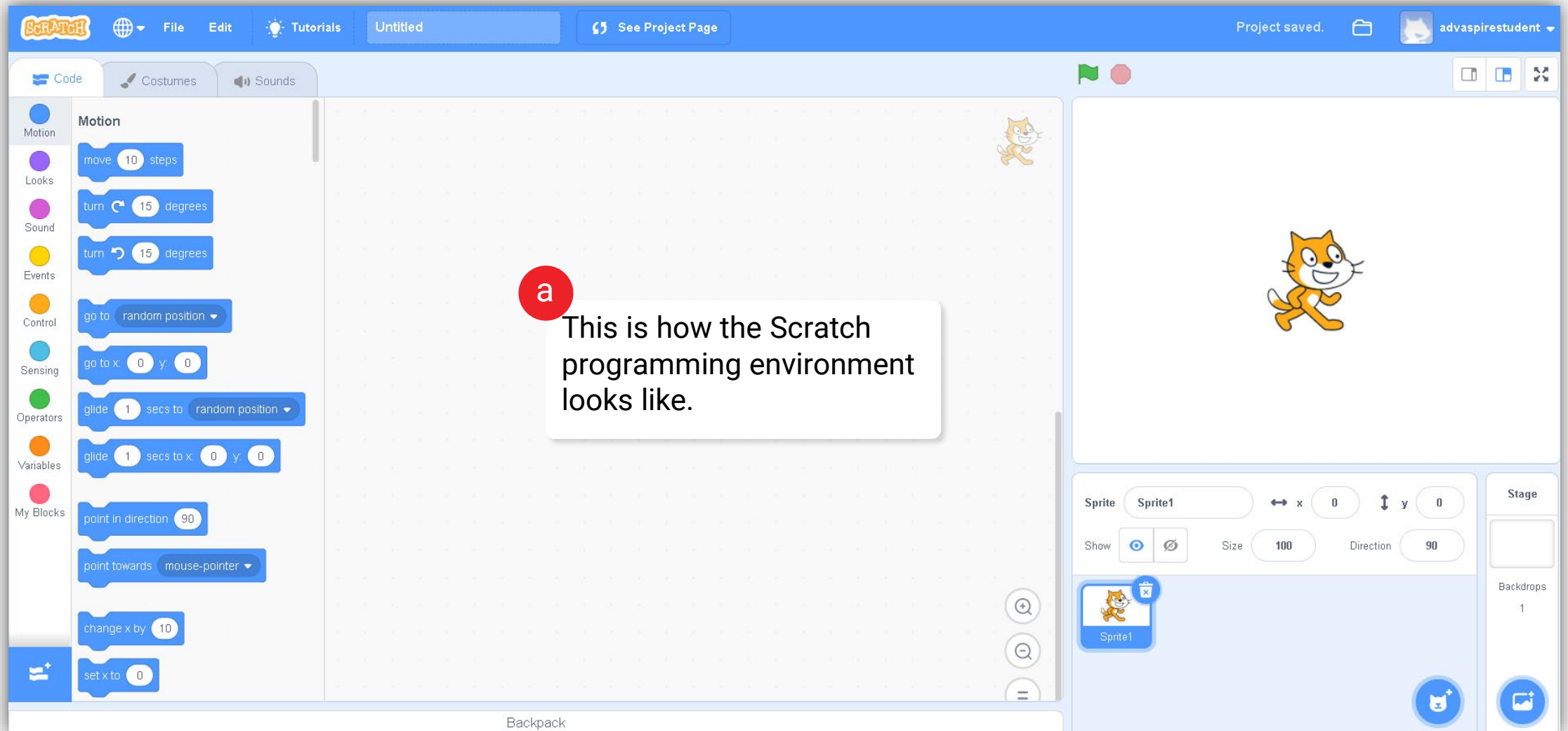


Scratch User Interface





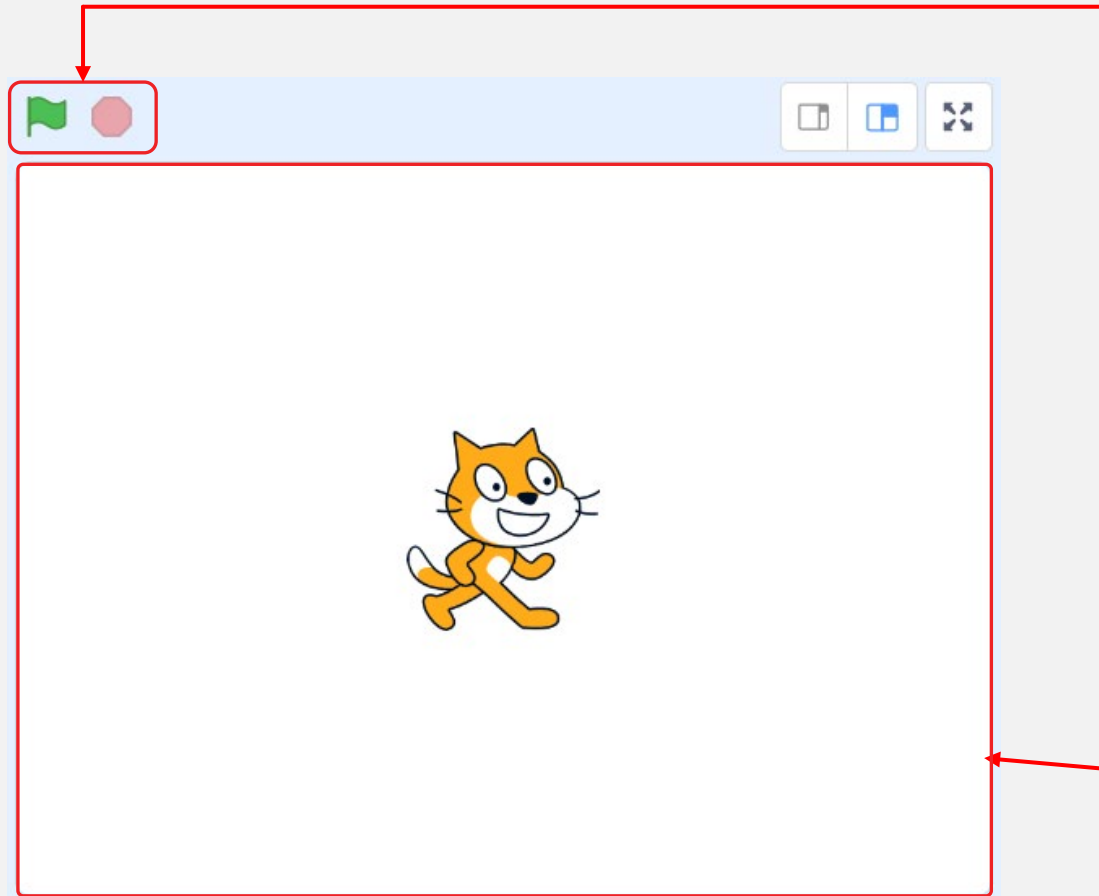
Scratch Programming Environment



Backpack



Scratch – Flag and Stop



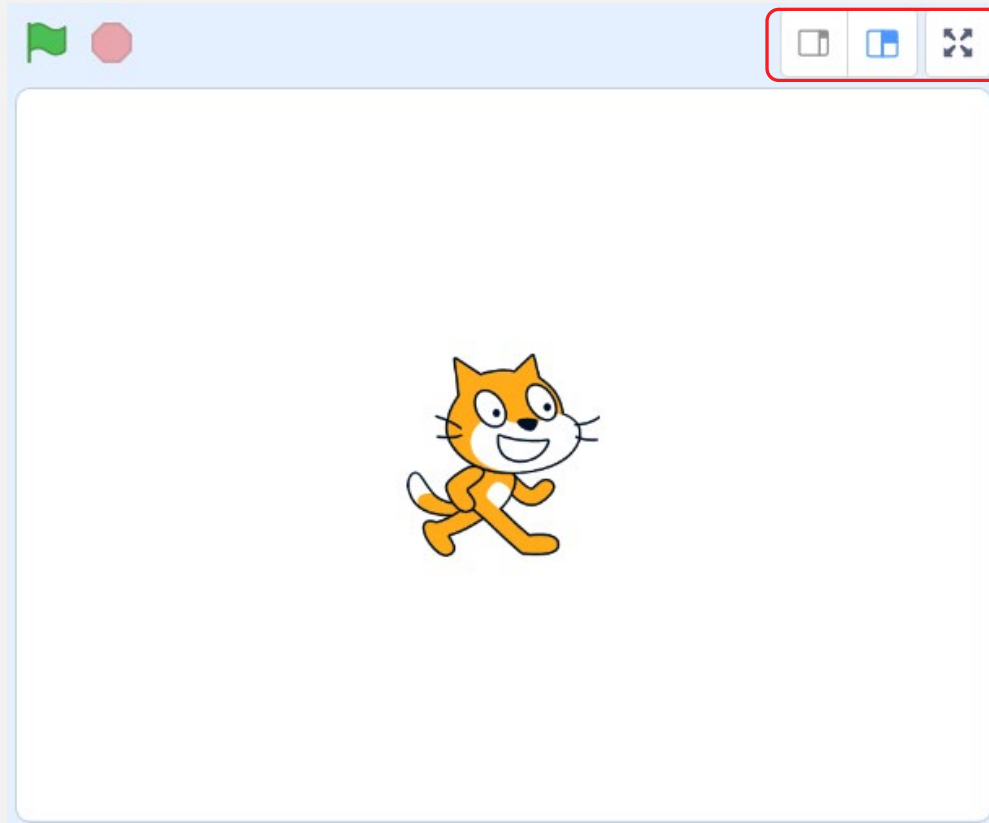
There is a green flag button and a stop button above the stage:

Green Flag -> Start the program
Red Stop Button -> Stop all programs




This is called the “Stage”, this is where your sprites move in the game, and your sprite can’t move out of the stage.



Scratch – View Mode

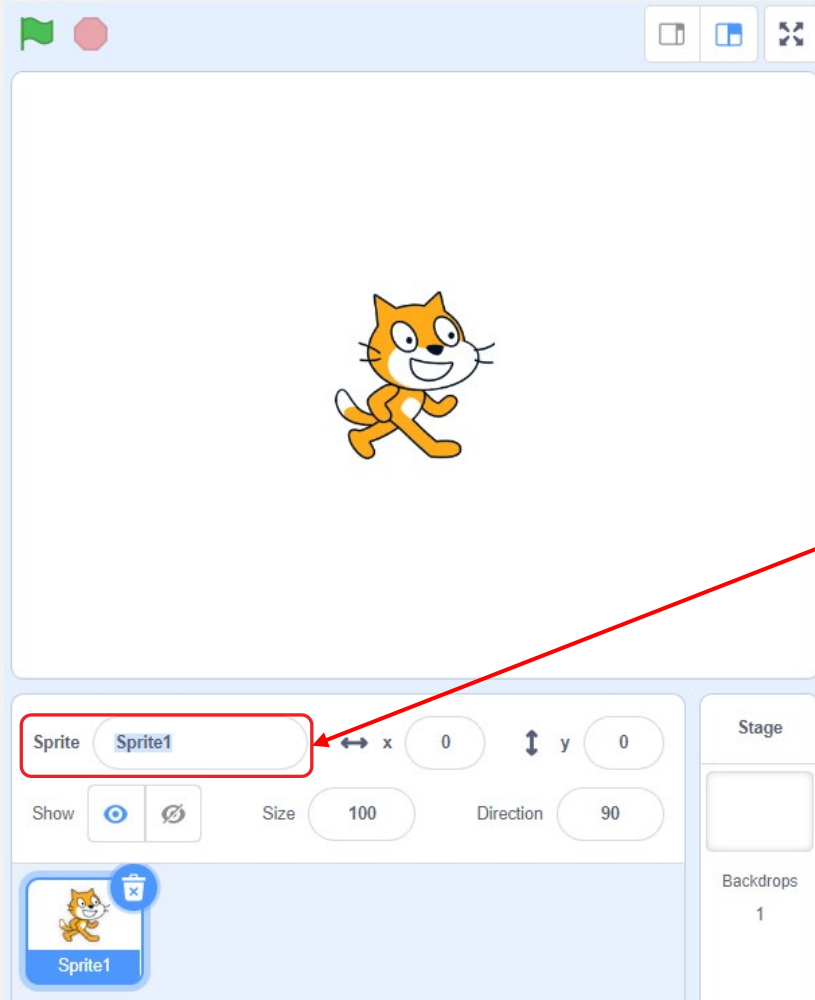


On the top right corner above the stage, there are 3 view mode to select:

-  -> Programming Space is **bigger**, Stage is **smaller**
-  -> Programming Space is **smaller**, Stage is **bigger**
-  -> No Programming View, Stage is on Full Screen



Scratch – Sprite Name

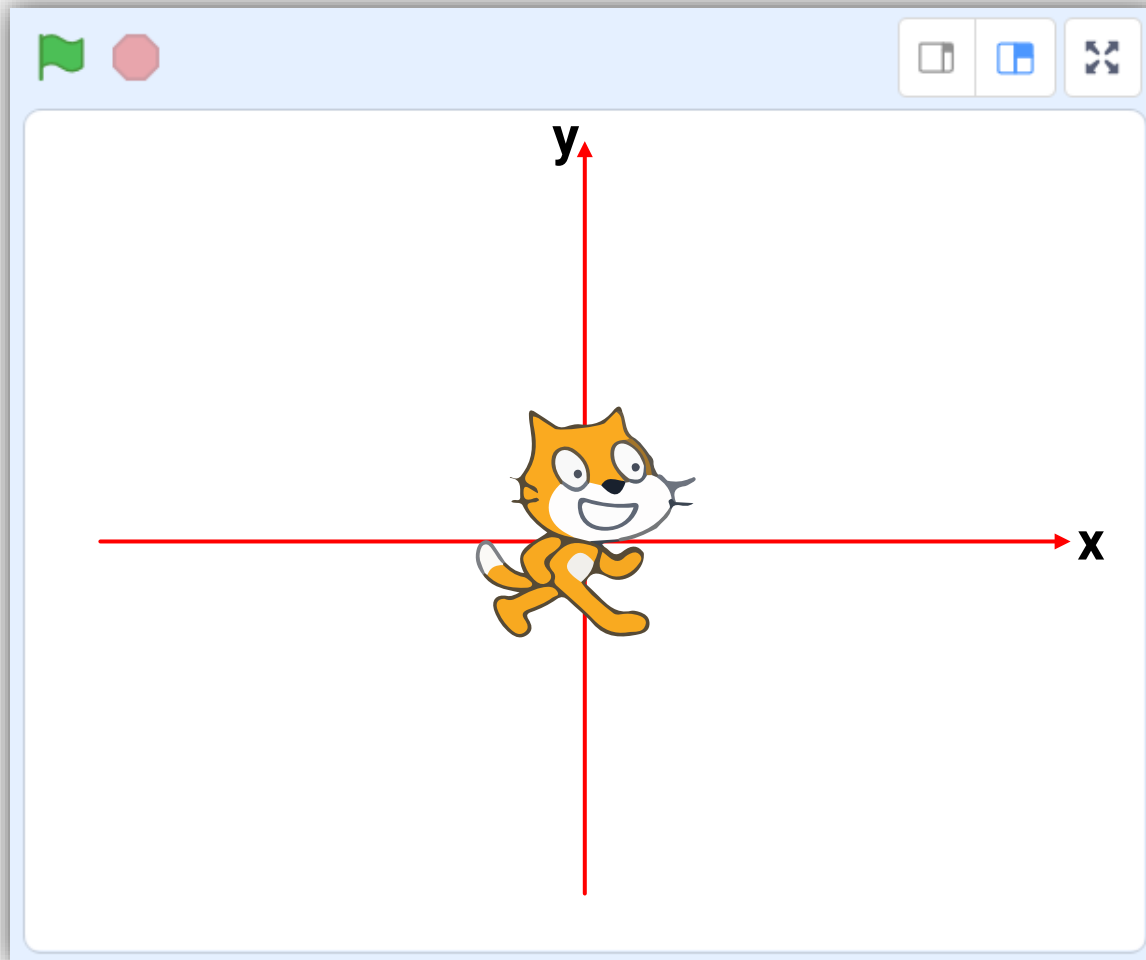


This is where you can set the name of your sprite.

We will rename the sprite to make the coding easy when you have specific target to refer.



Scratch – Coordinates system



Coordination: (x , y)

Centre = (0 , 0)

Coordination basically refers to the position of the Sprite.

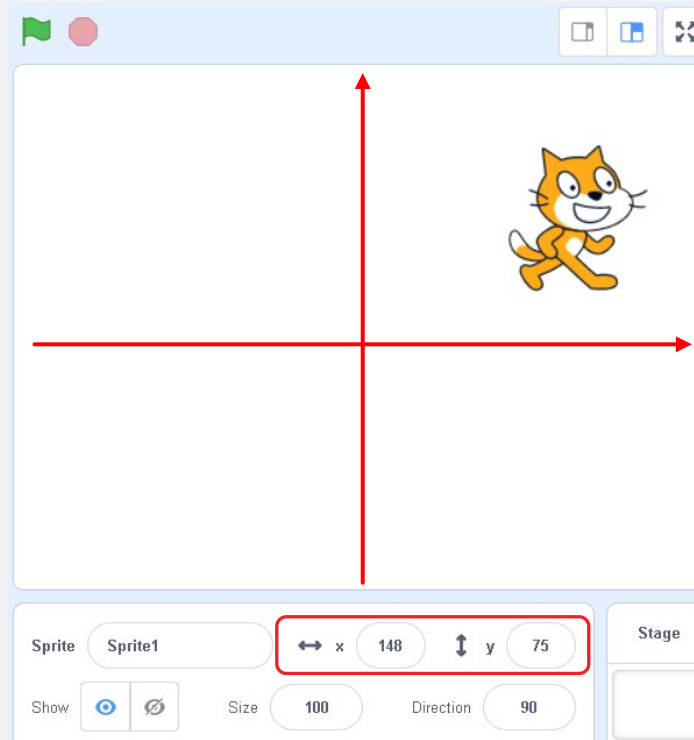
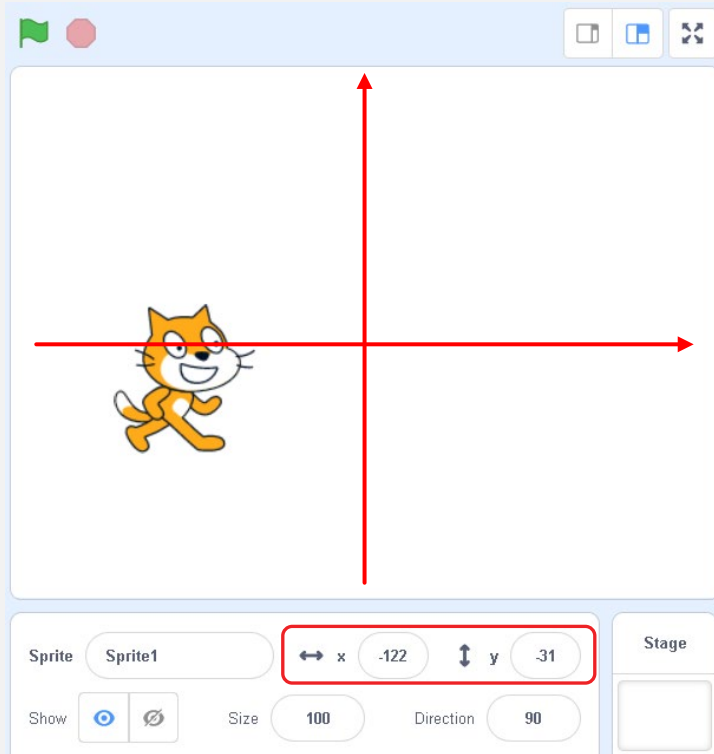
x coordinate >> left and right
y coordinate >> up and down

Change in coordination:

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



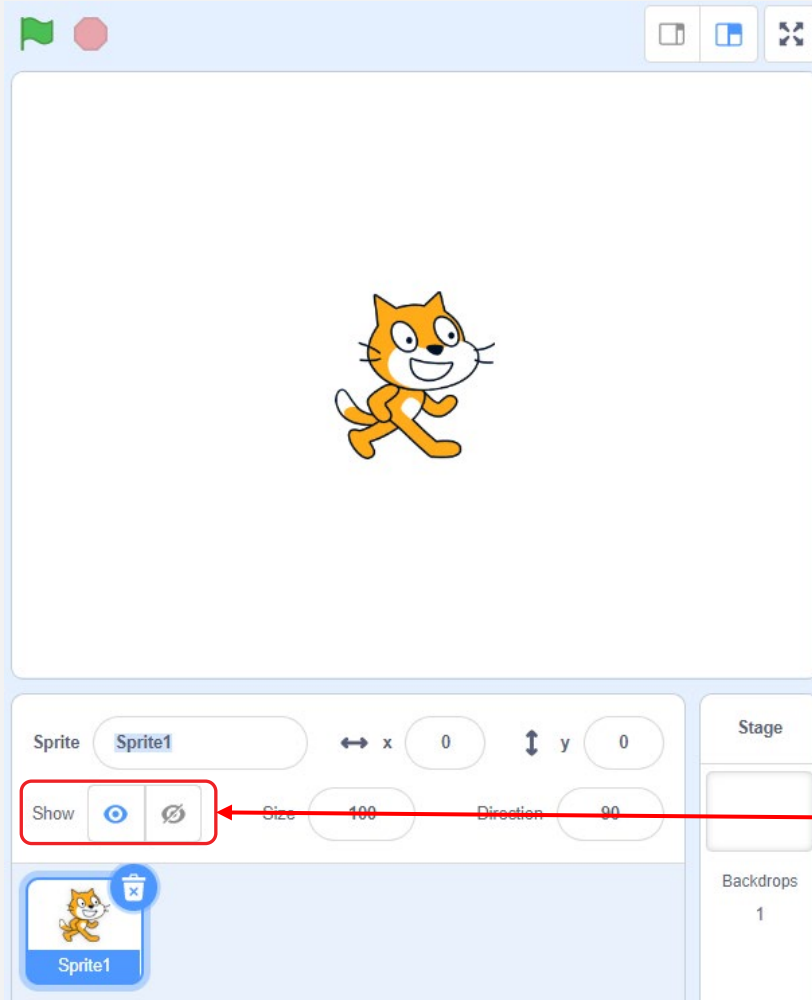
Scratch – Coordinates system



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



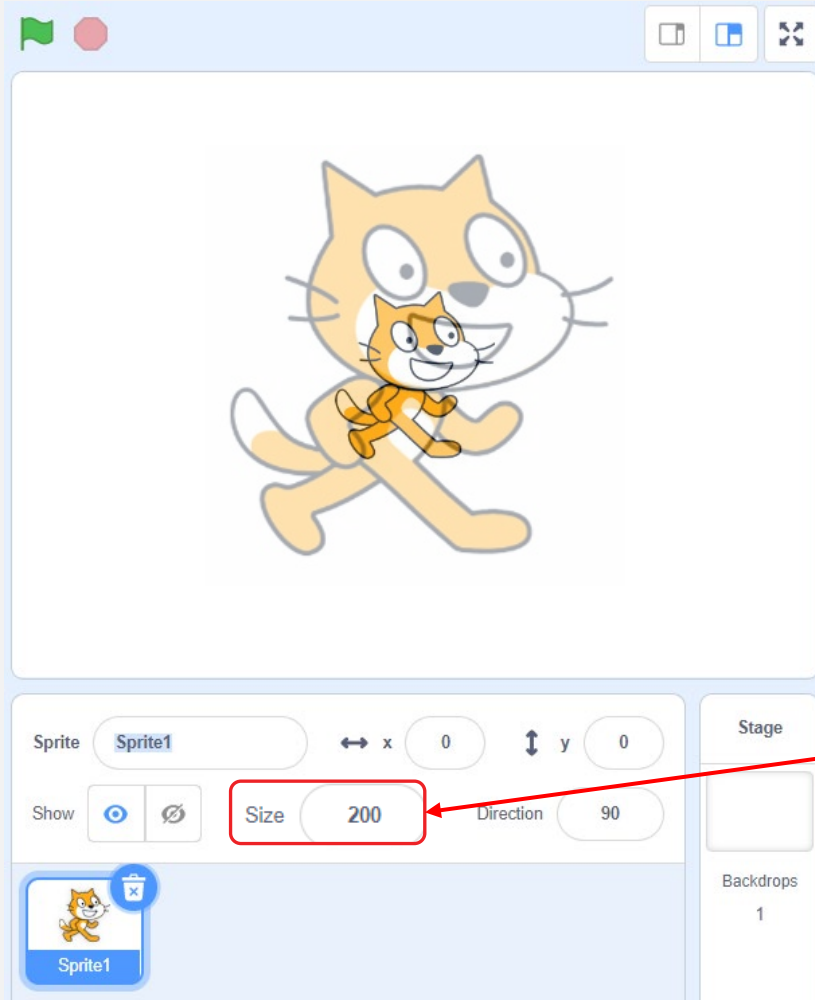
Scratch – Show or Hide



This part is the visibility setting for the sprite, you can make the sprite to show or hide by clicking the options.



Scratch – Size

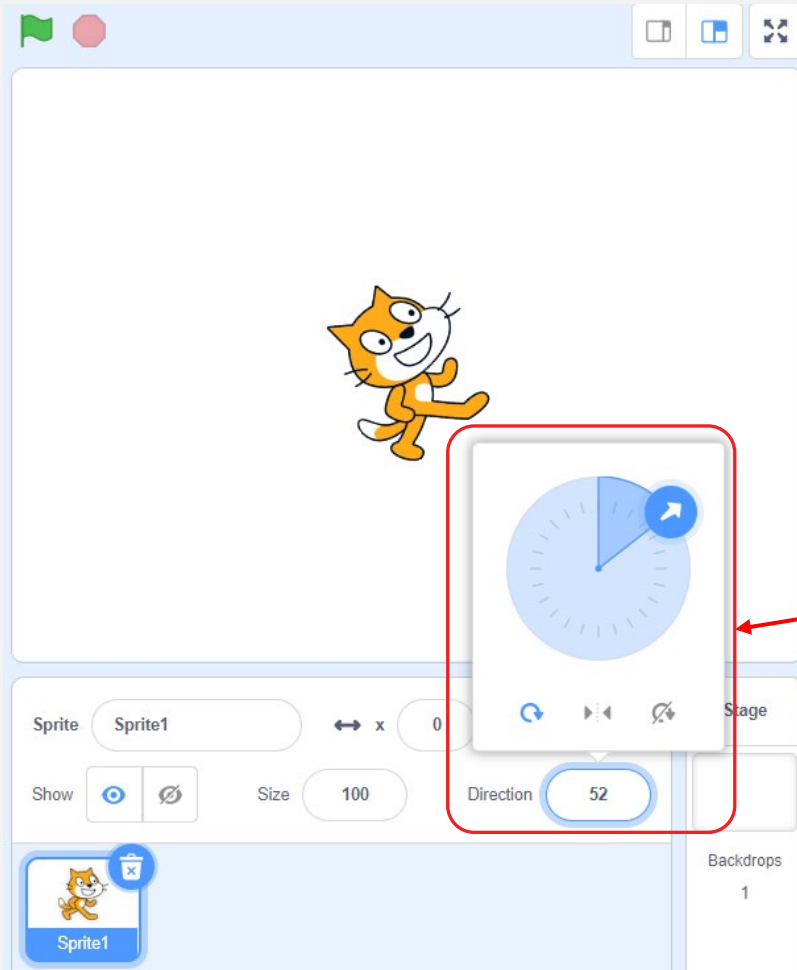


You can set the size of the sprite by changing the value here.
100 means the original size of the sprite, which is represented in %.

The higher the value, the bigger the size your sprite is, same goes to smaller value with smaller size.






Scratch – Direction



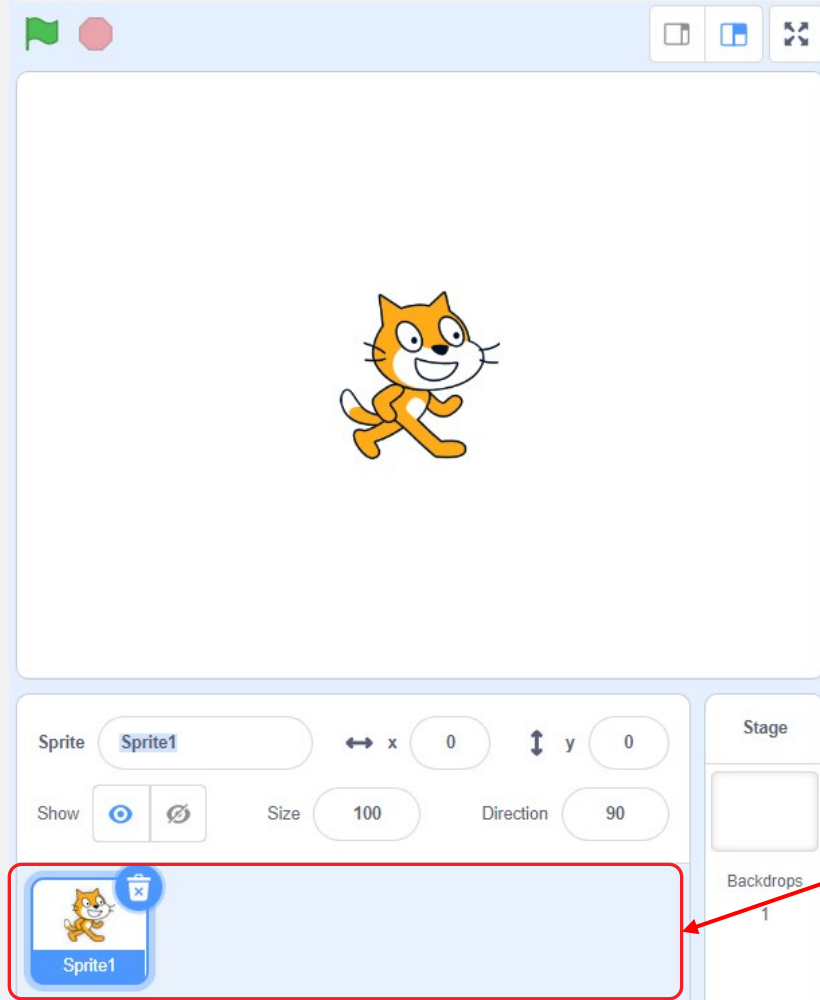
If you wish to rotate the cat, you can set the direction over here.

It also offers the options for rotation style:

-  -> Rotate All Around, your sprite can rotate in all direction
-  -> Rotate Left/Right only, Sprite either turn left or right only
-  -> Do not rotate at all, Sprite is fix without rotation



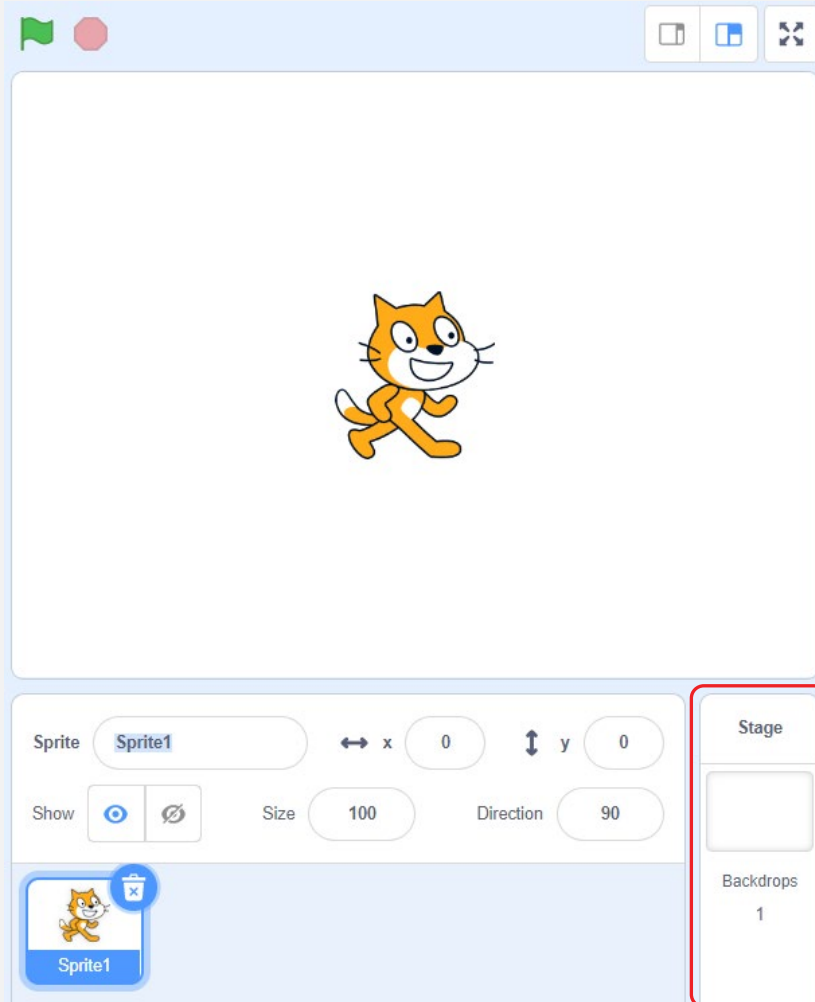
Scratch – Sprites



Whenever a new sprite is added, it will be shown in this section with the sprite name.



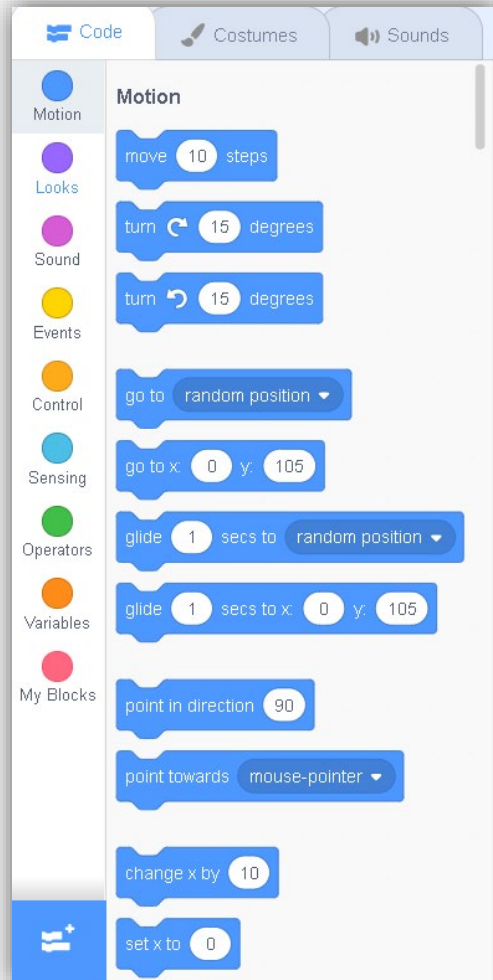
Scratch – Backdrops



You can also add backdrops to your stage, but the backdrop is not moveable, it will automatically fix on the screen.



Scratch Programming Blocks - Types



Programming Block Types >>

Motion – Control movement of the object

Looks – Control the appearance of everything

Sound – Control sound(s)

Events – Set up something to trigger the action(s)

Control – Function purpose (if ... else ..., wait, loop, repeat until)

Sensing – Use like a sensor

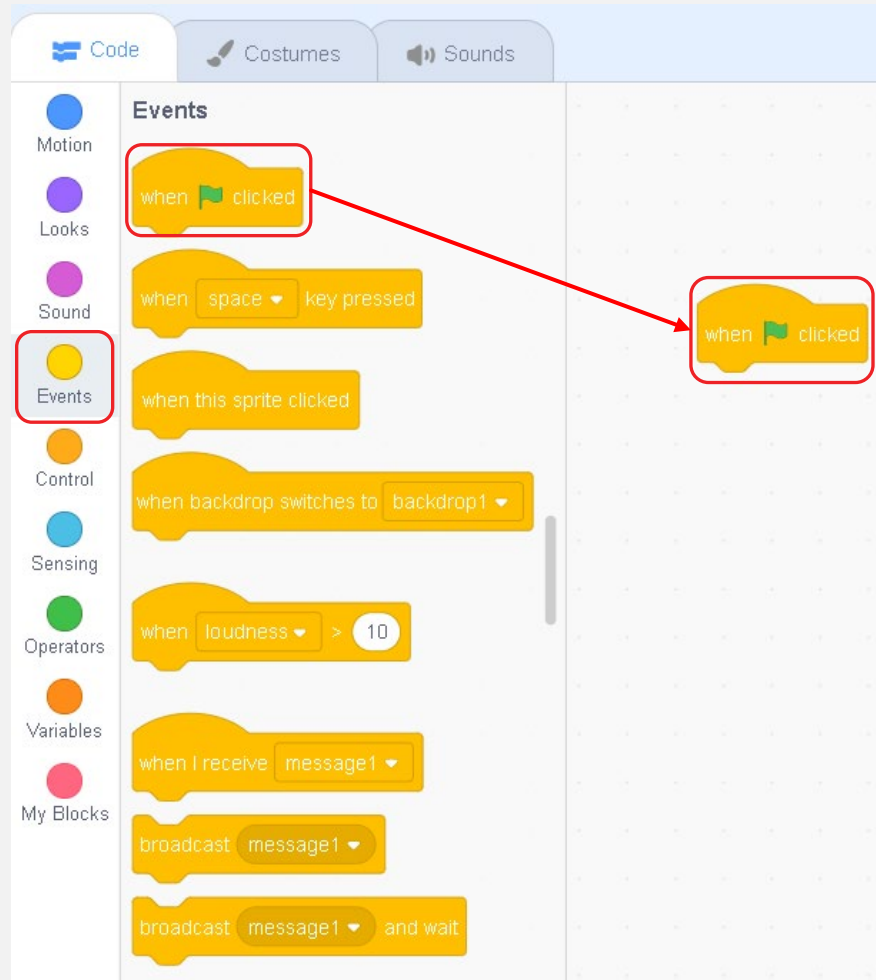
Operators – For mathematical Calculation

Variables – For variable settings

My Blocks – Customize your own blocks



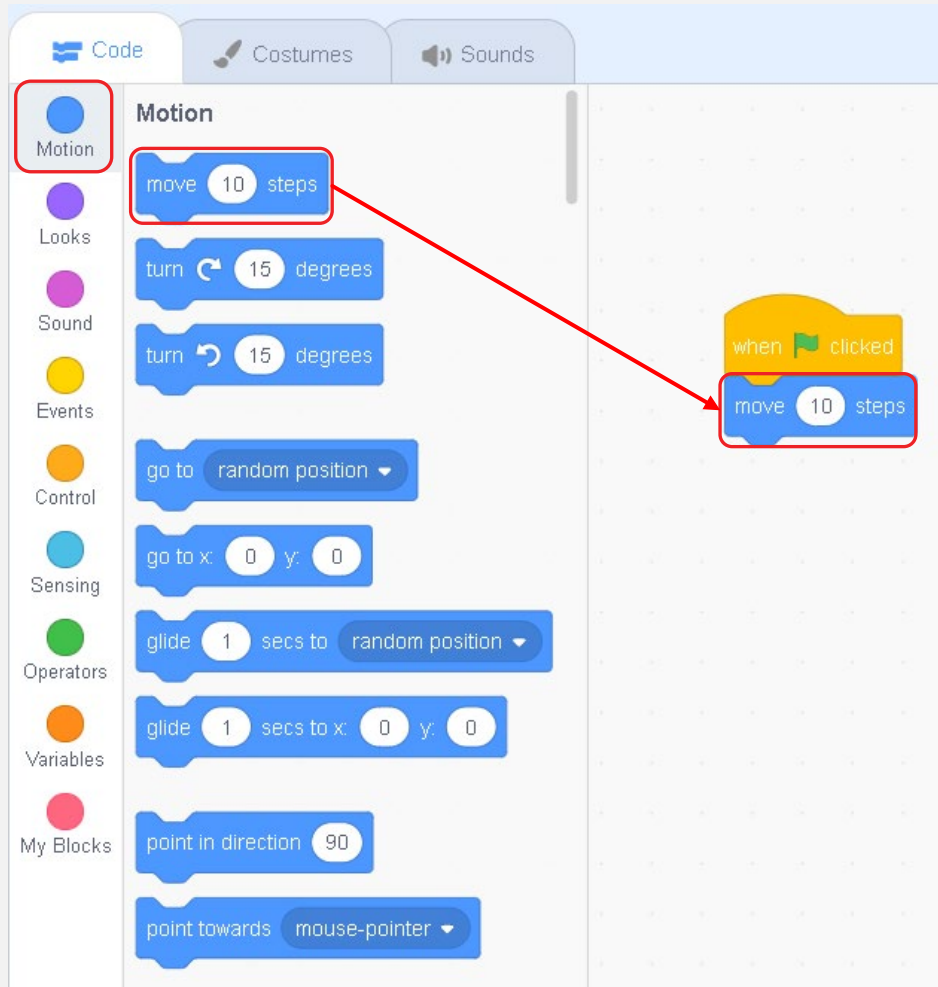
Scratch Programming Blocks - Move



Go to “Events” category and drag “when flag clicked” to the script.



Scratch Programming Blocks - Move

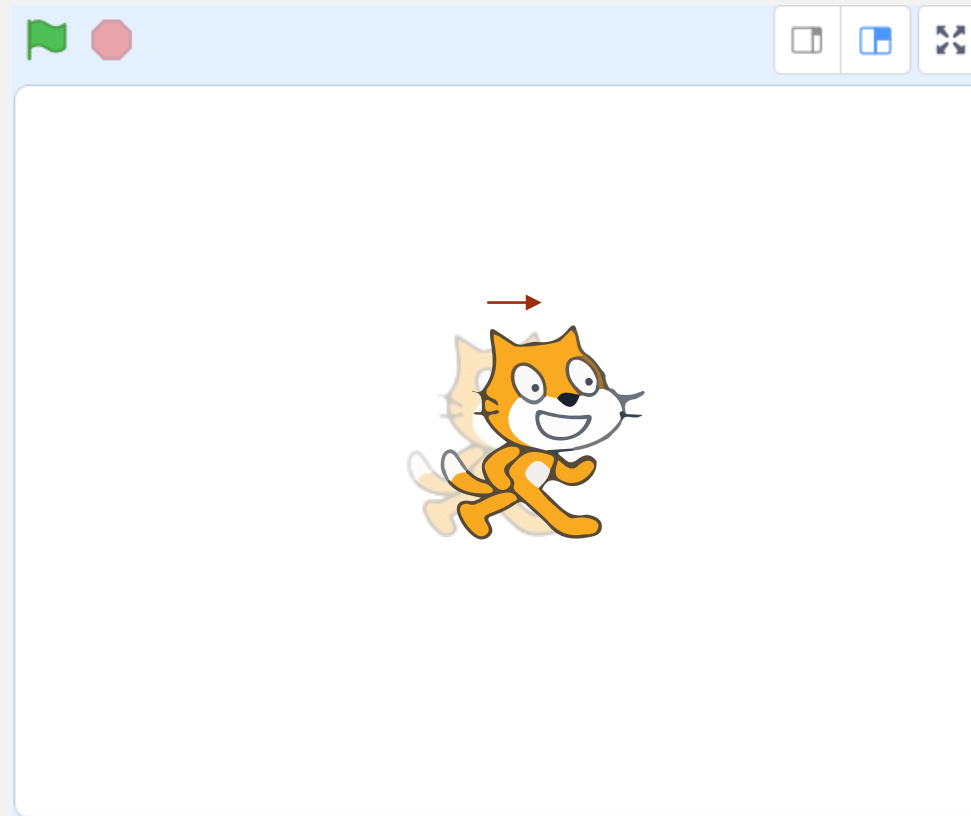
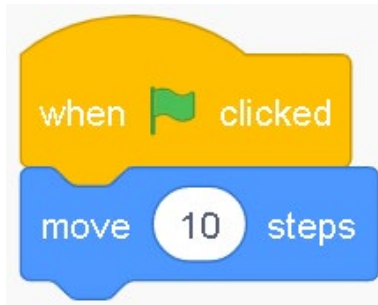


Go to “Motion” category and drag “move 10 steps” and attach it below the “when flag clicked” block.



Scratch Programming Blocks - Move

Script:



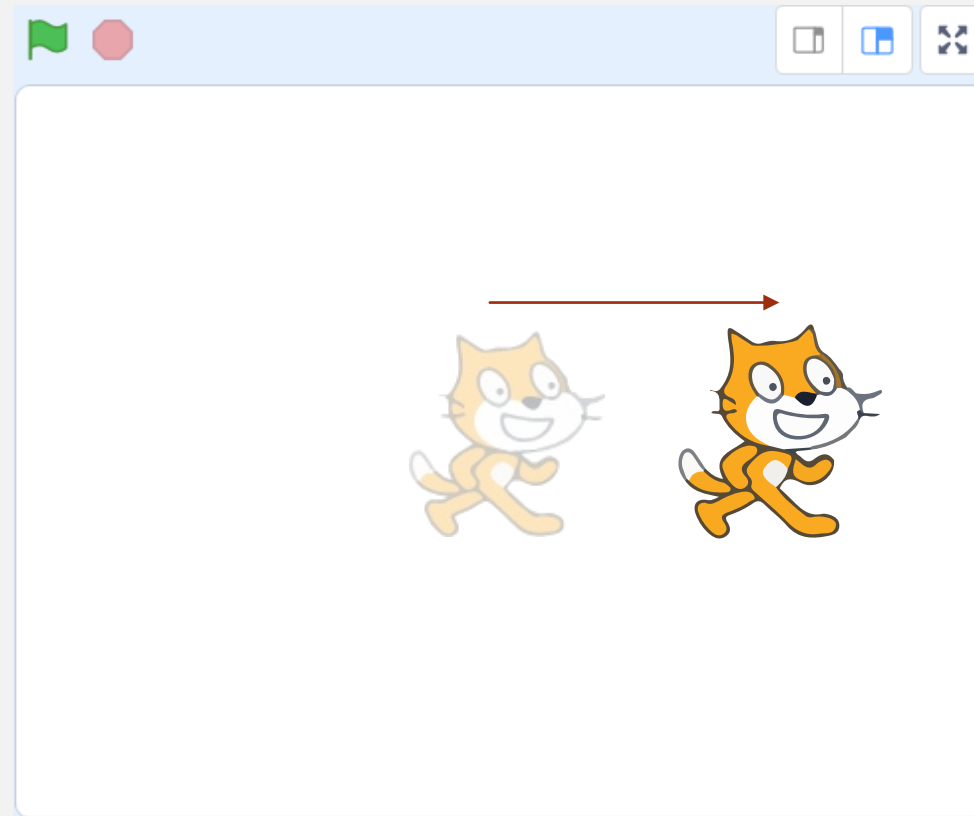
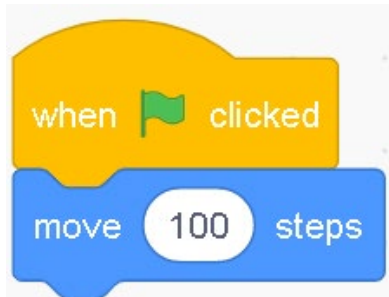
By giving a script as shown >>

The sprite (Cat) will move 10 steps forward at the pointing direction after “Flag” button is clicked.



Scratch Programming Blocks - Move

Script:

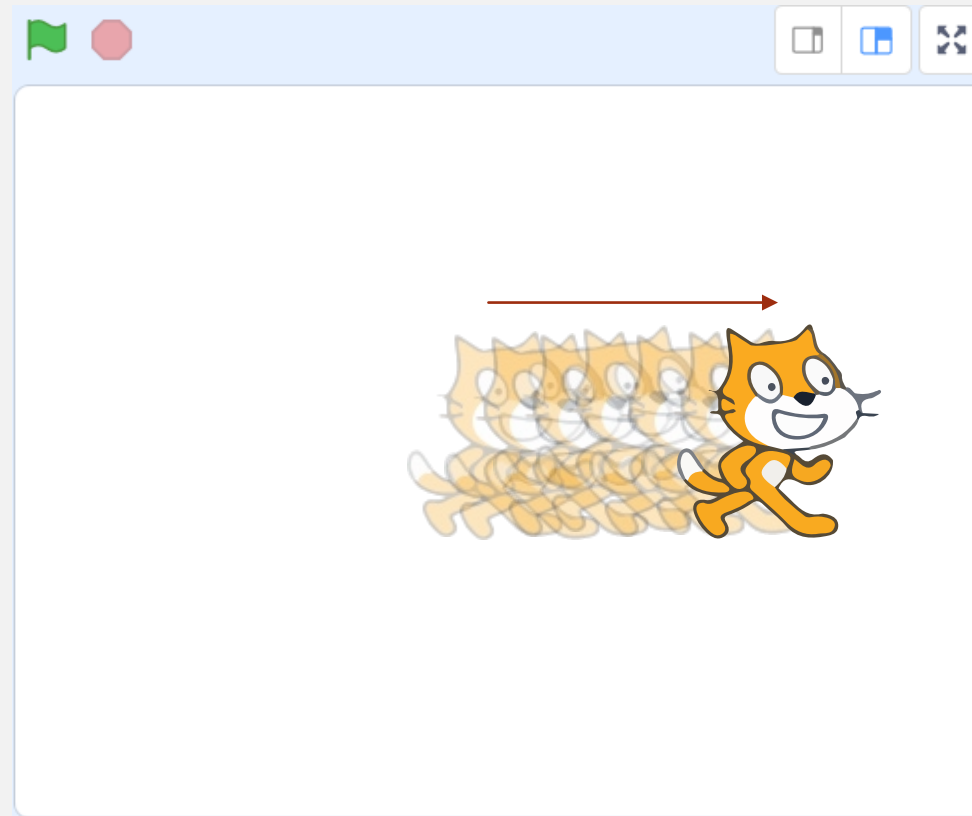
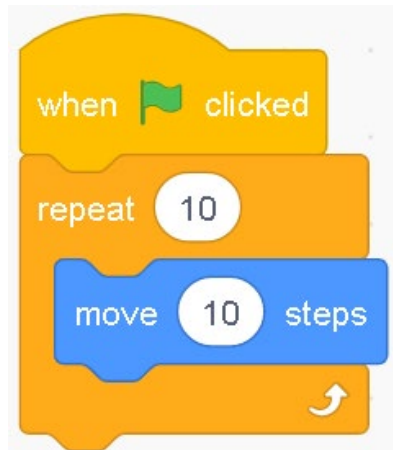


If you change "10" to "100",
You sprite (Cat) will straight
jump forward for 100 steps.



Animation Moves

Script:

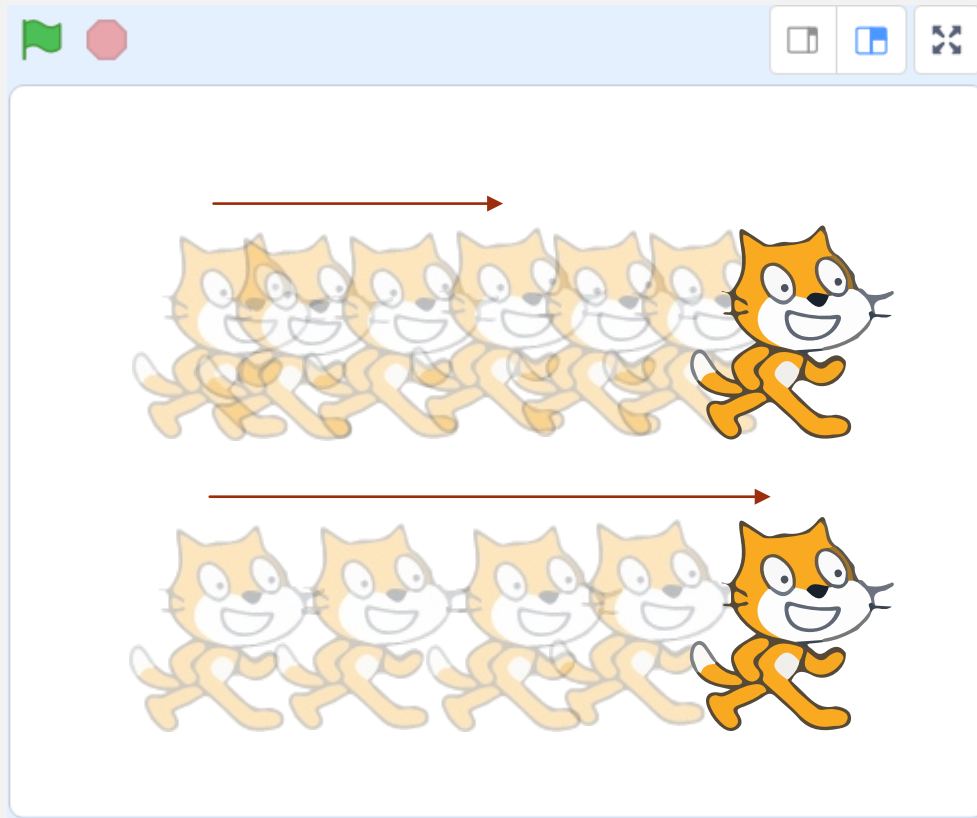


To make animation move, you need to make the steps repeat for few time.

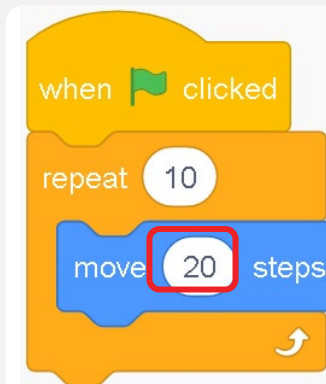
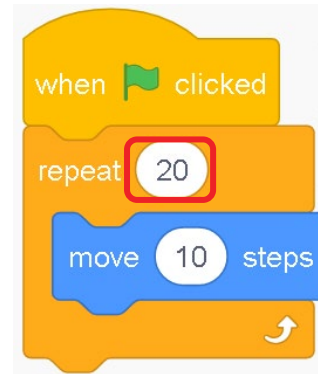
>> Move forward for 10 times, each time moving 10 steps. Total travelling distance = 100 steps.

1 repeat block processing time = 0.03 second

Faster or Further?



Script:



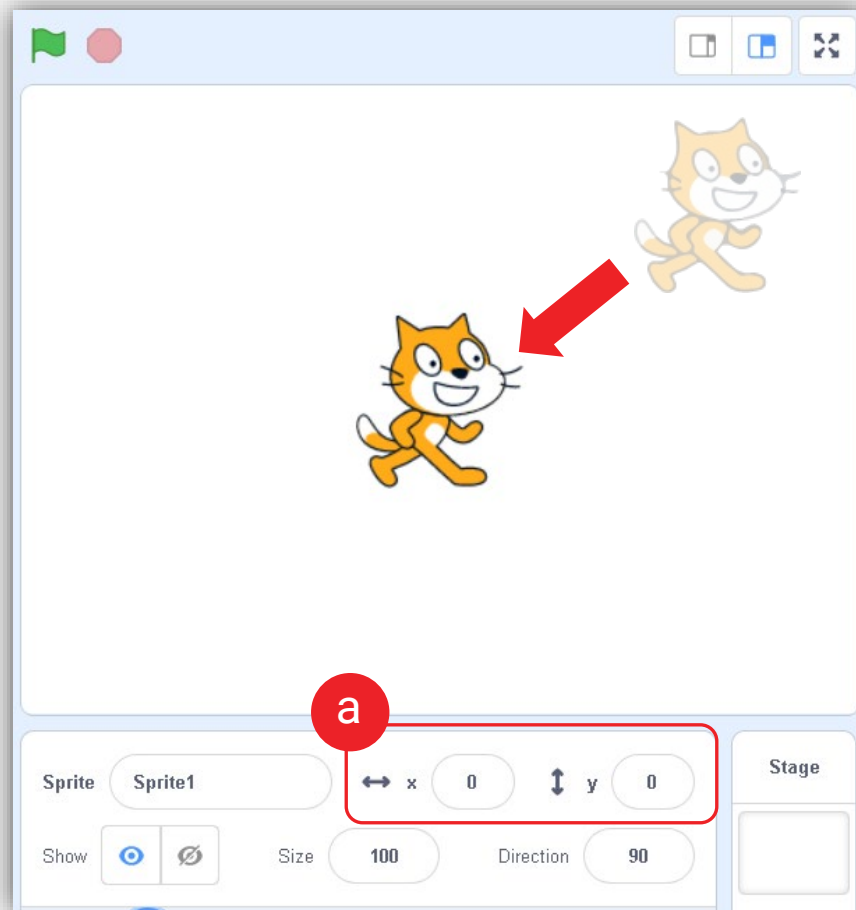
If you put higher value in repeat block (without changing the move steps), the cat should move further.

If you put in higher value for move steps, the cat will move faster. Lower value will make it move slower.

***Let's put your hands on and test the effect on this.**



Adjust your position



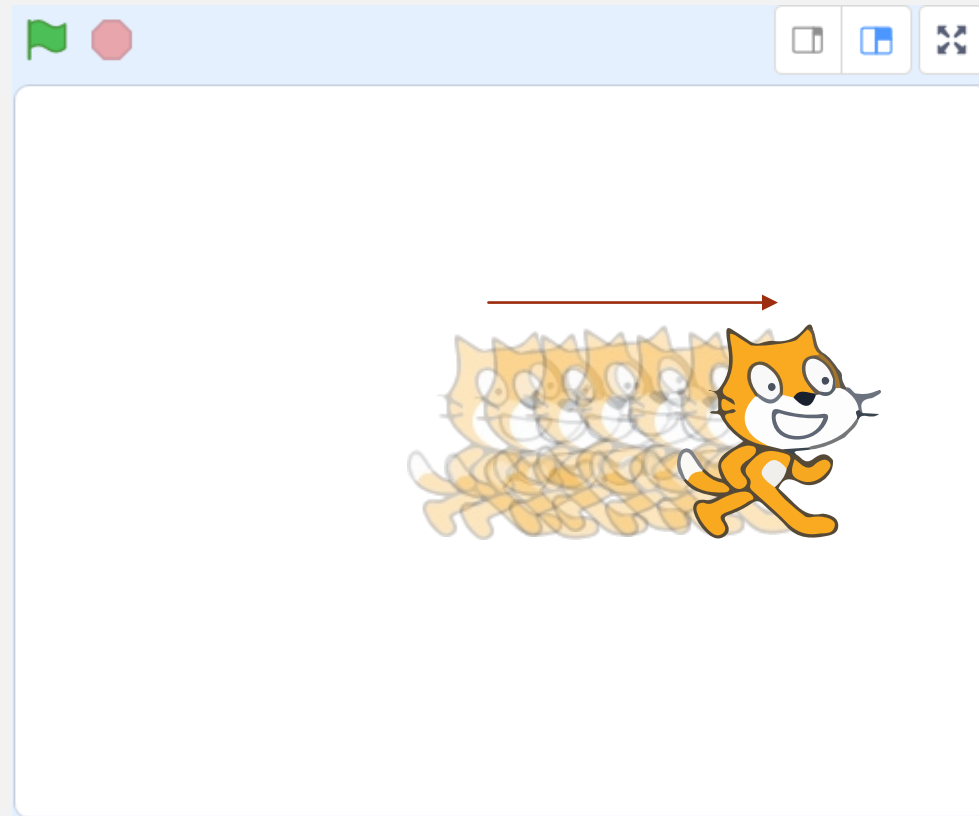
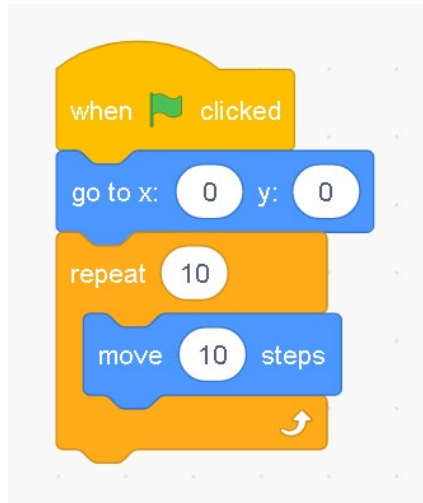
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When you want your cat to go back to the center position before you click the “flag” button, you can adjust directly by changing the value of x and y to zero.



Set your starting position

Script:



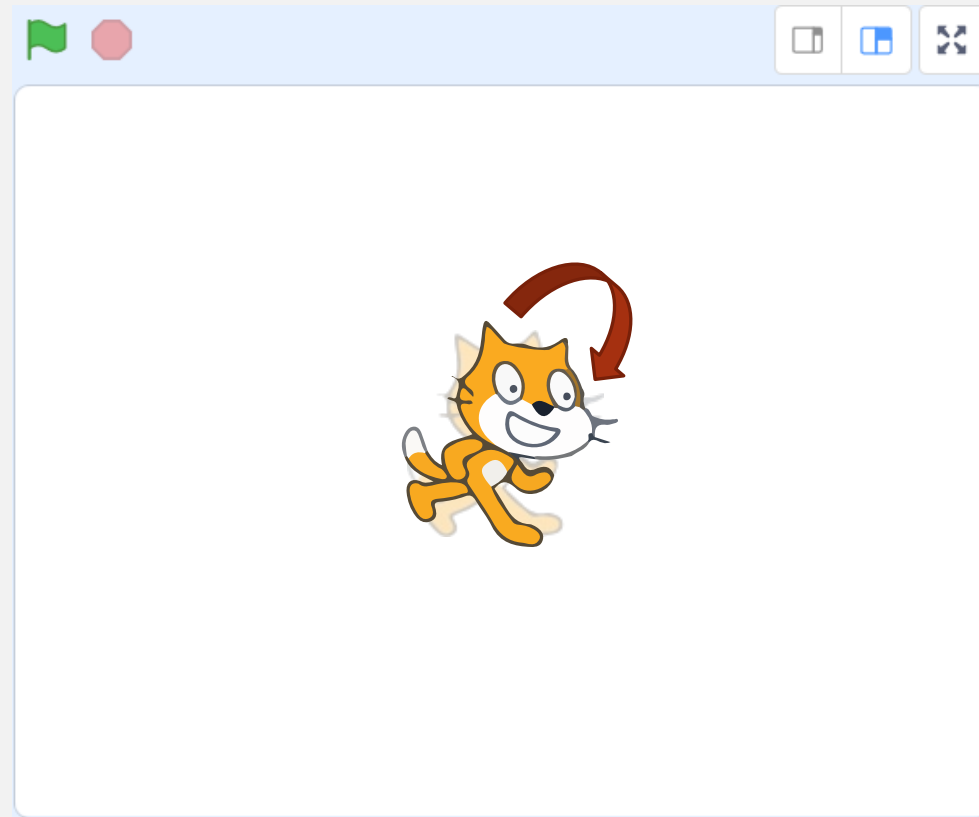
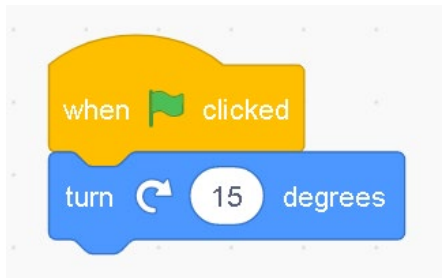
To make your object always starts from the center (0,0), you need to:

>> Set “go to x: 0 y: 0” after you click the “flag”.



Turning Direction

Script:



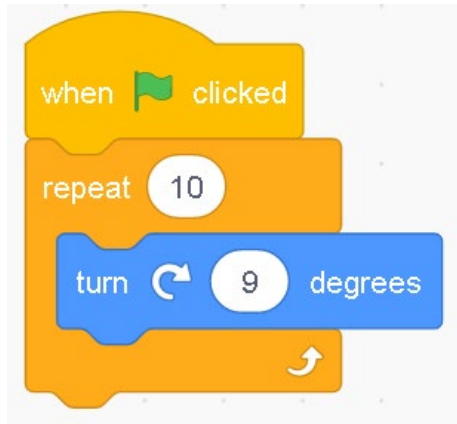
From start, your object will face 90°.

You can add a turn block and make it turn to a certain degree.



Turning Direction

Script:

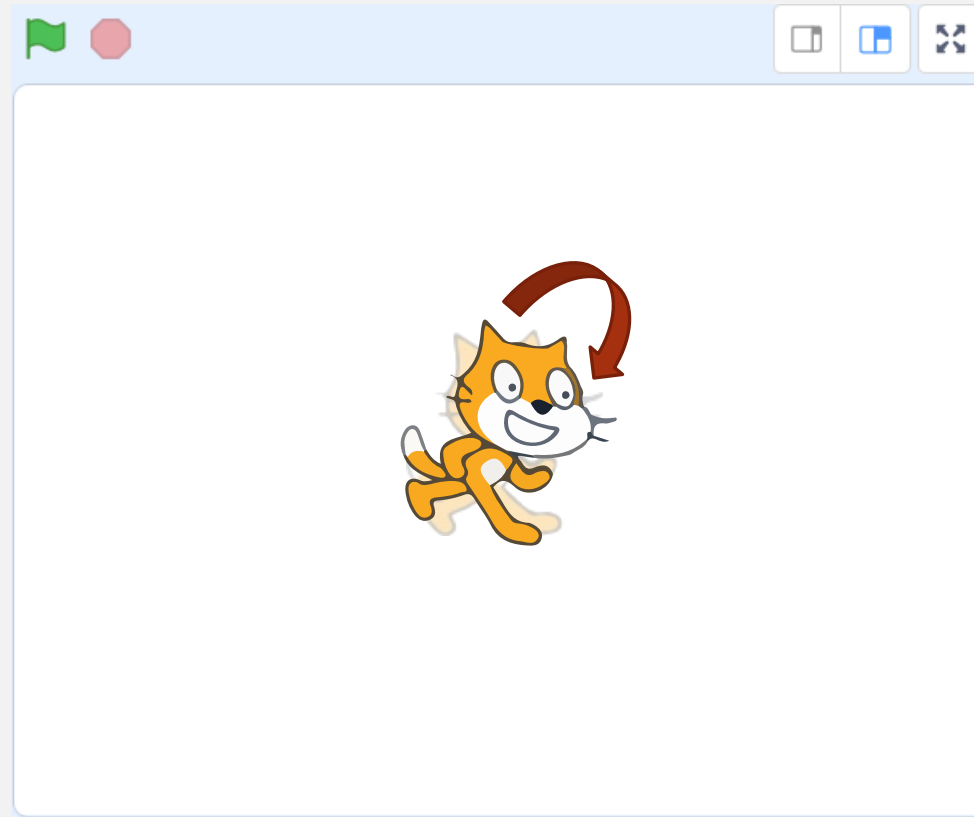


If you want to make like a motion when doing 90° turn, you can add the repeat block and repeat 10° for 9 times.



Set Starting Direction

Script:

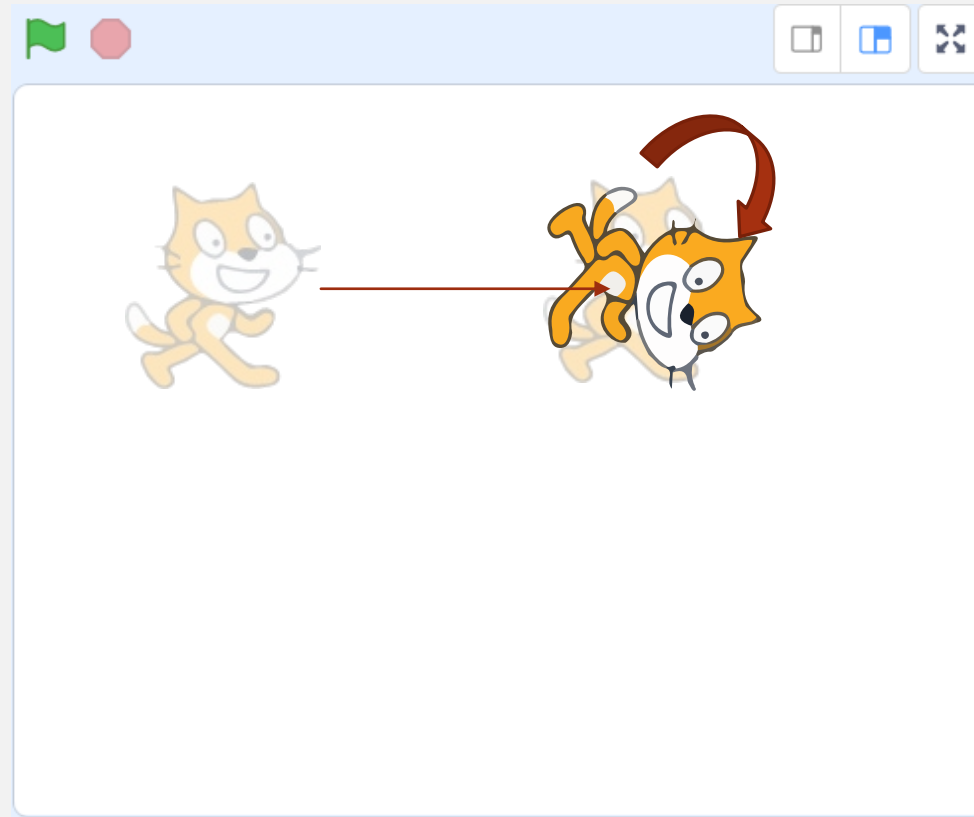
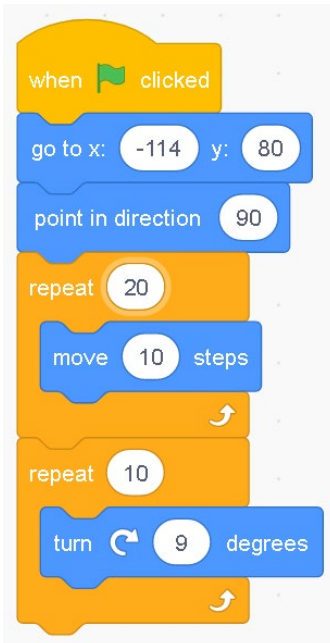


To set your starting direction, you can place a “**point in direction**” block before you start the turning motion.



Combining Actions

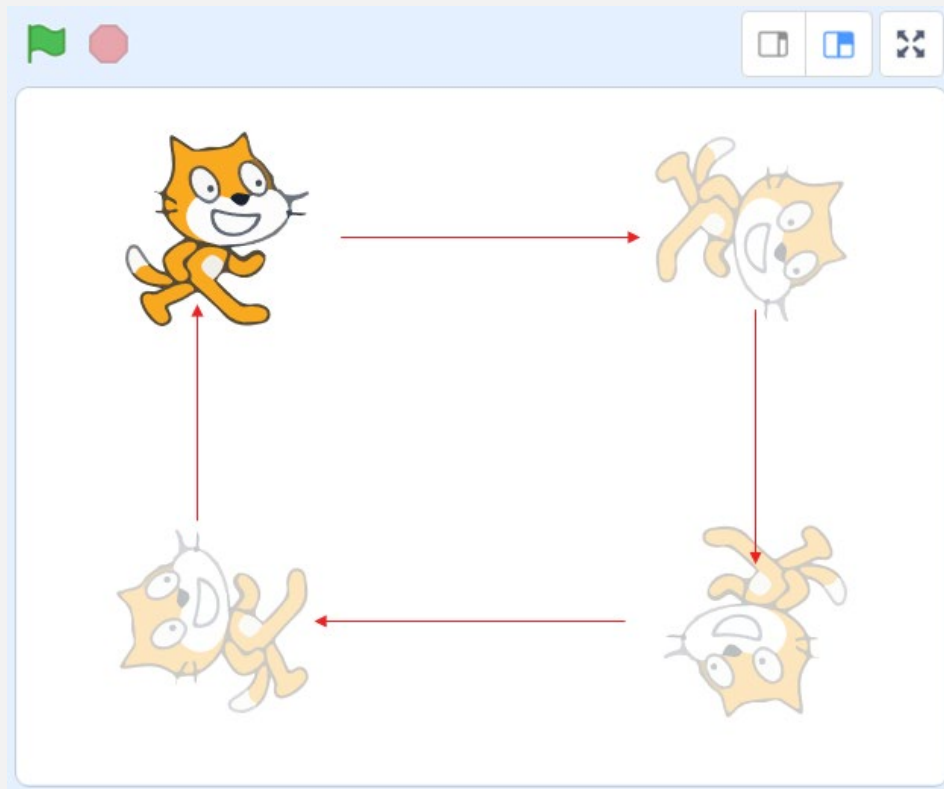
Script:



You can combine the blocks together to make the motions.
This is to make the cat move front 200 steps from the starting position then turn 90°



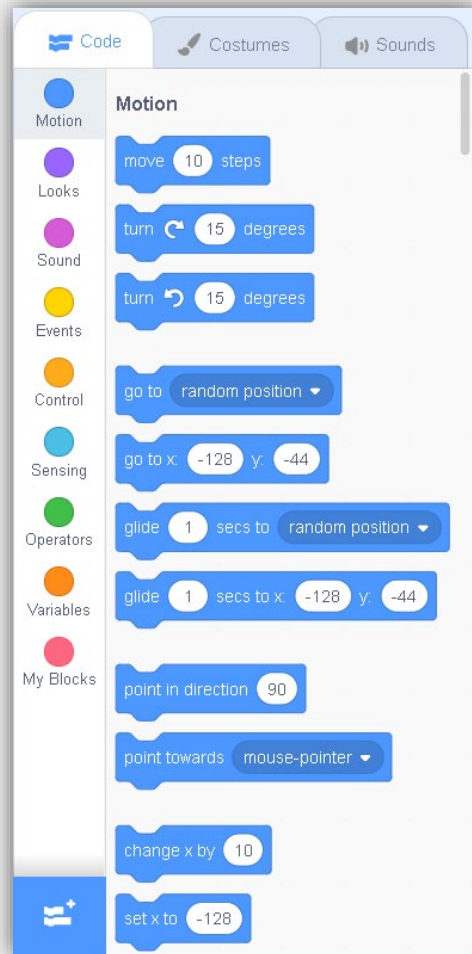
Challenge - Move in Square



I would like to make the cat to move in a square shape, do you know how to do it?



Test out other blocks

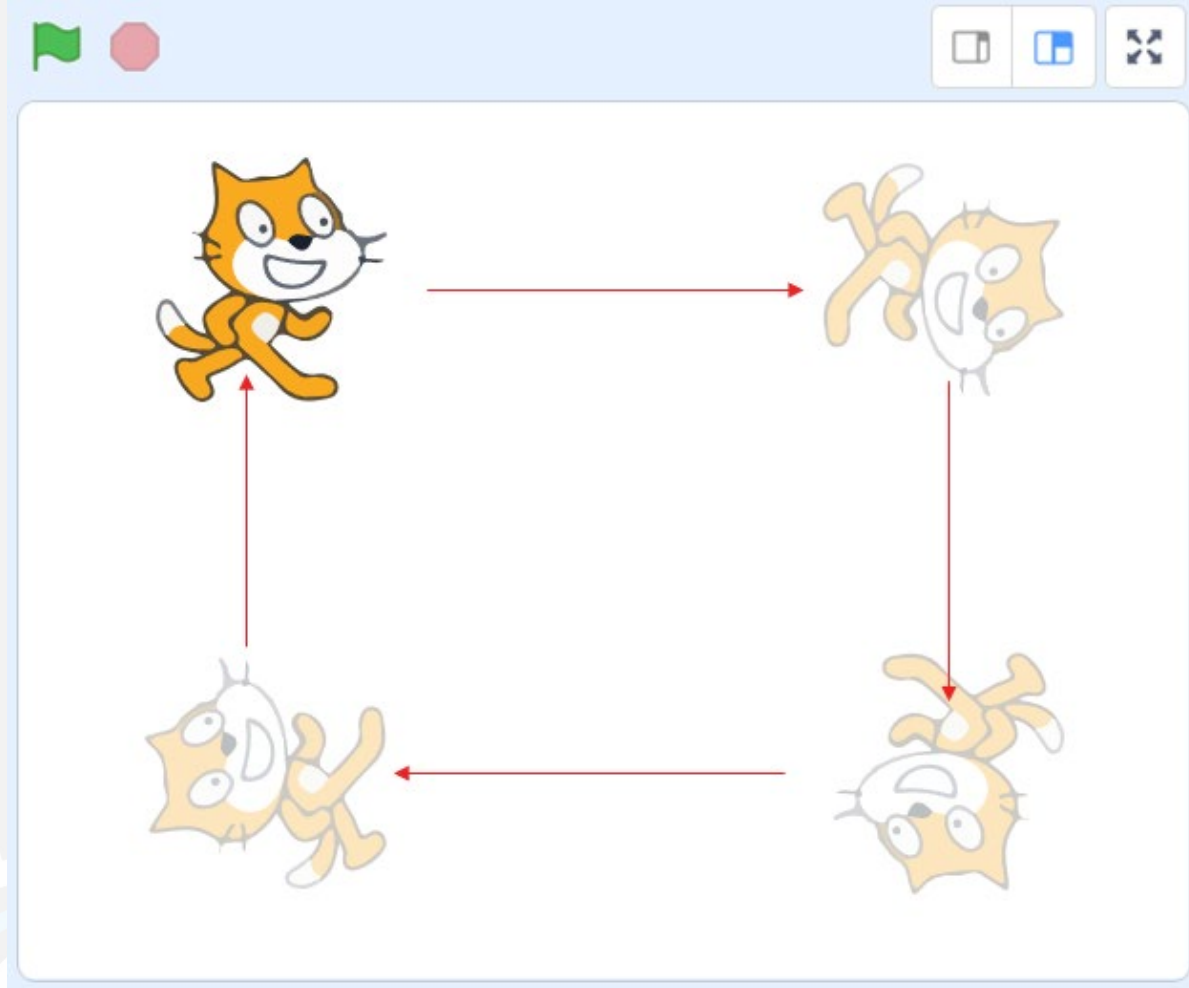


There are plenty of block types and motion for you to test out. I will cover how to change the look and make conversation in the animation.



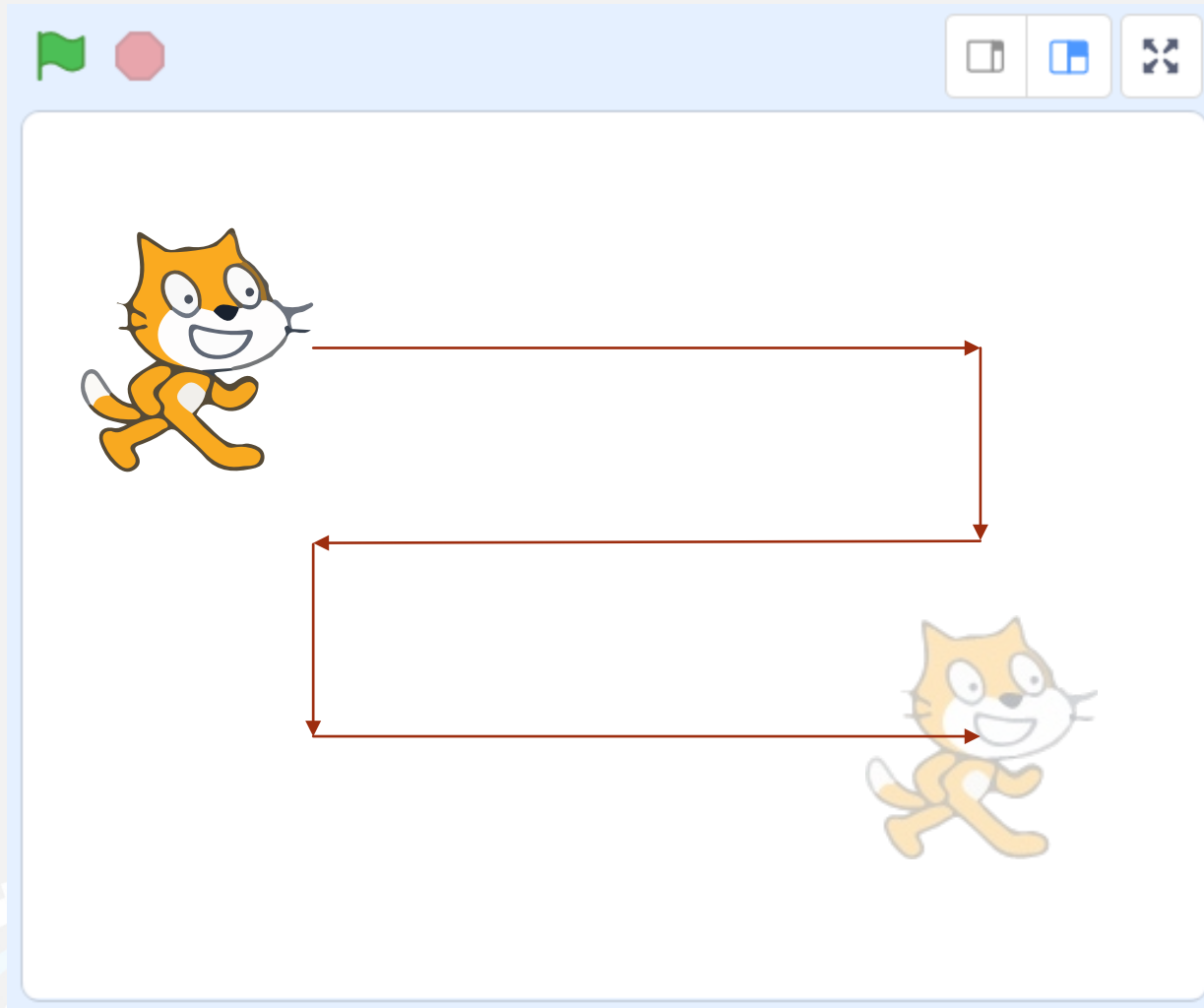
Mission *for*

Topic 1.1



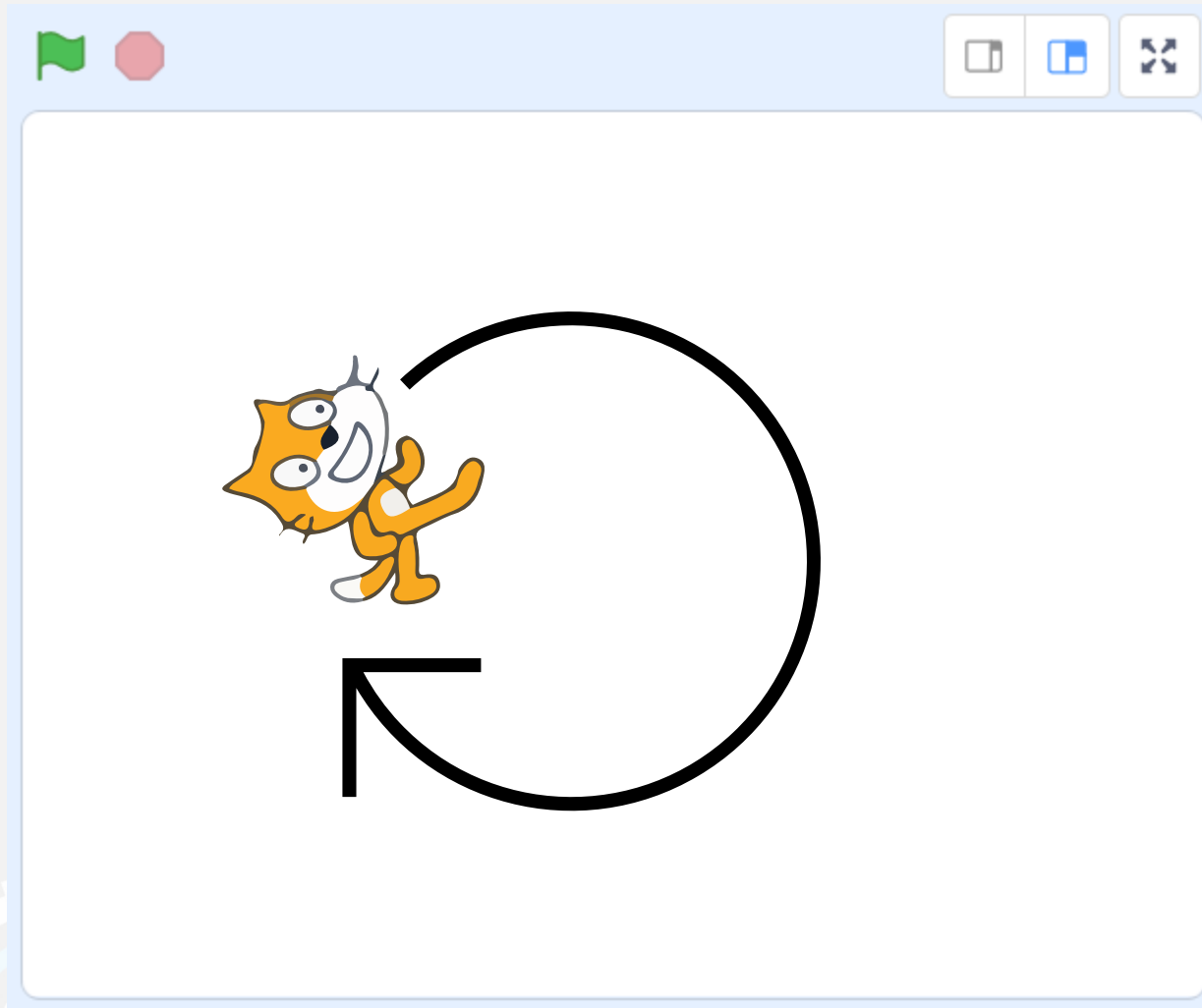
T1.1 – Mission 1

I would like to make the cat to move in a square shape, do you know how to do it?



T1.1 – Mission 2

Can you do an “S” shape?



T1.1 – Mission 3

How to make your cat to keep moving in a circle?



Summary

1. We had learnt how to create our scratch account.
2. Scratch programming is Free to use coding software and very suitable for coding beginner to learn coding and create their first animation story and game.
3. Scratch user interface introduction.
4. Use motion blocks and control blocks to make the sprite moves.



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 :)