Scratch Programming

Topic 1.1

Introduction

Presented by Advaspire Team

Today's Topic

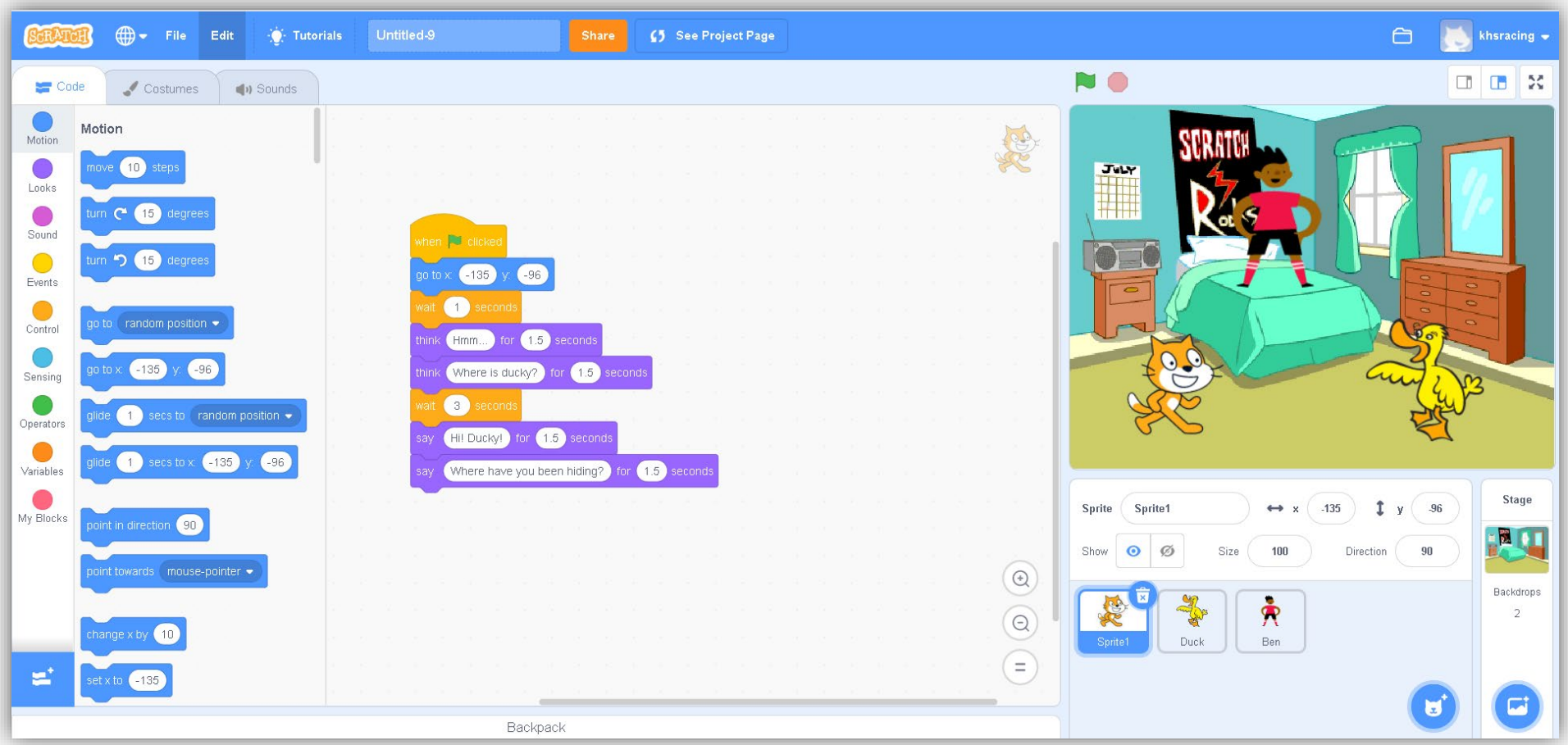
1. What is Scratch?
2. Why learn Scratch Programming?
3. Create an account for Scratch
4. Scratch User Interface
5. Make the cat move in square

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

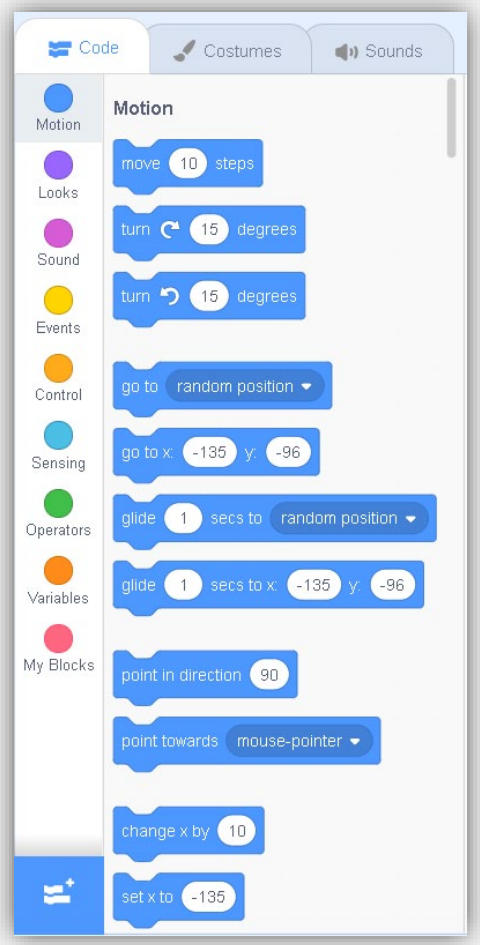
What is Scratch Programming?

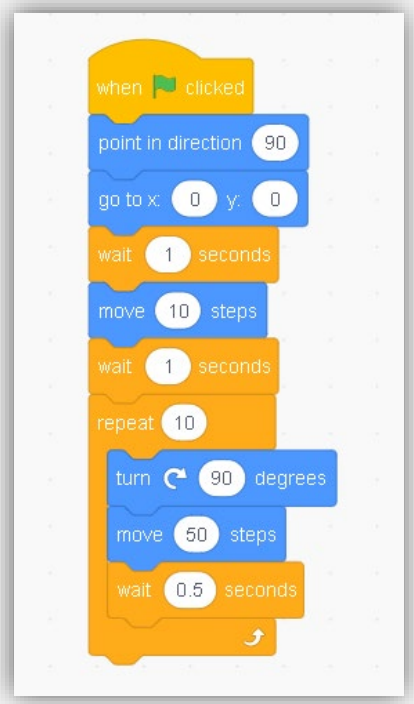
Scratch → Create Animation, Game, interactive stories, etc…

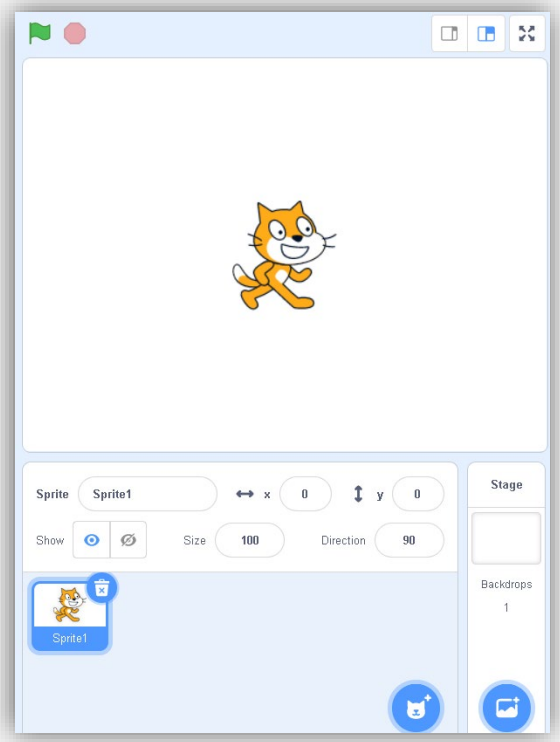


Why learn Scratch Programming?

Why learn Scratch Programming?



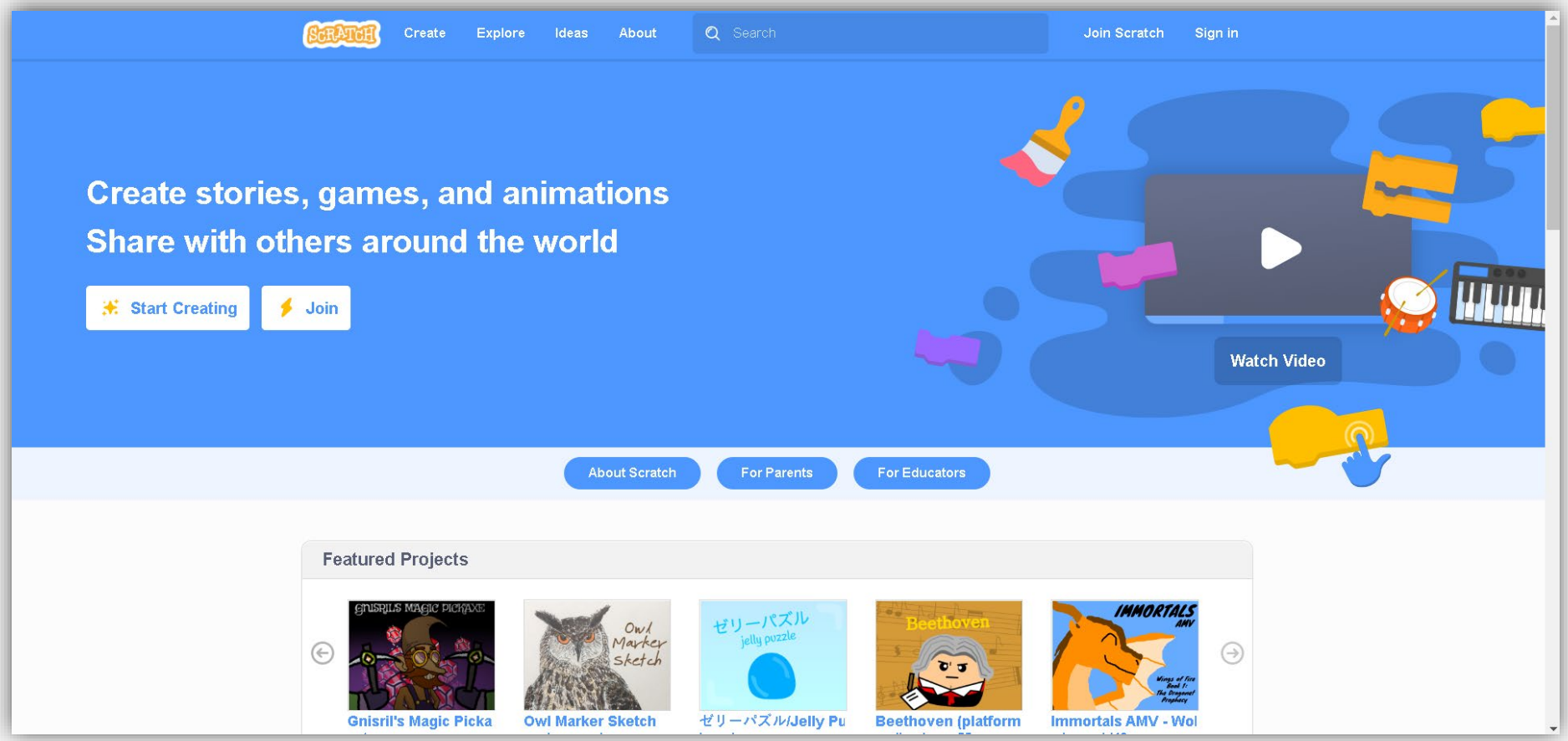




Scratch Programming is:

>> 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

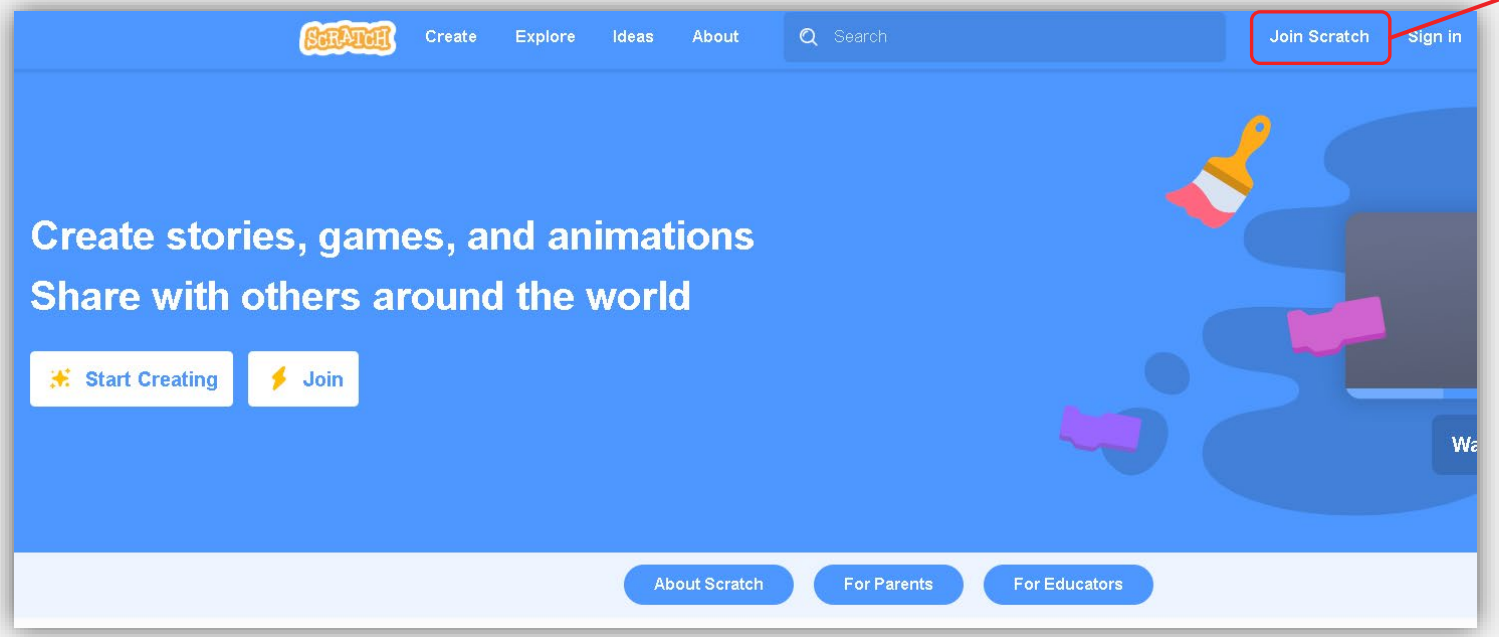
How to get yourself started?



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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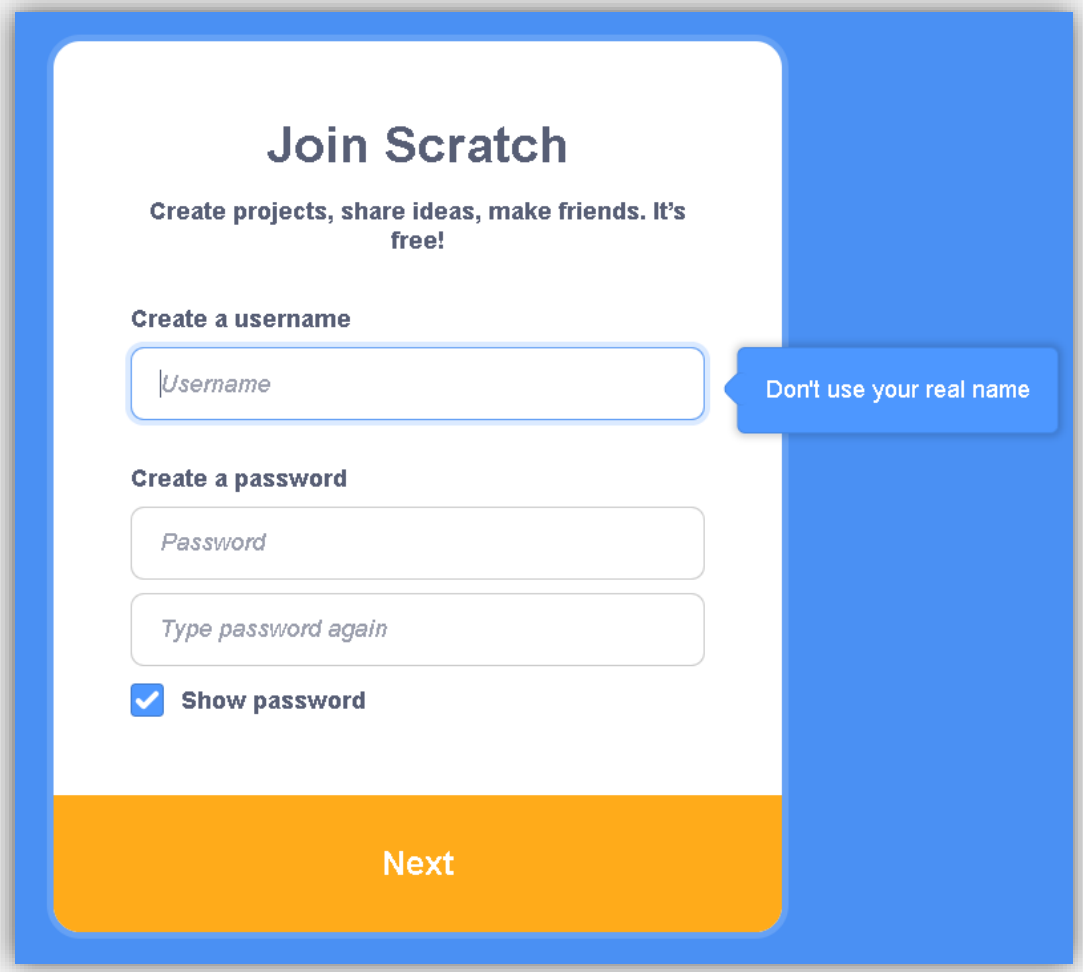
Click "Join Scratch" to create your own Scratch account.

>> 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?

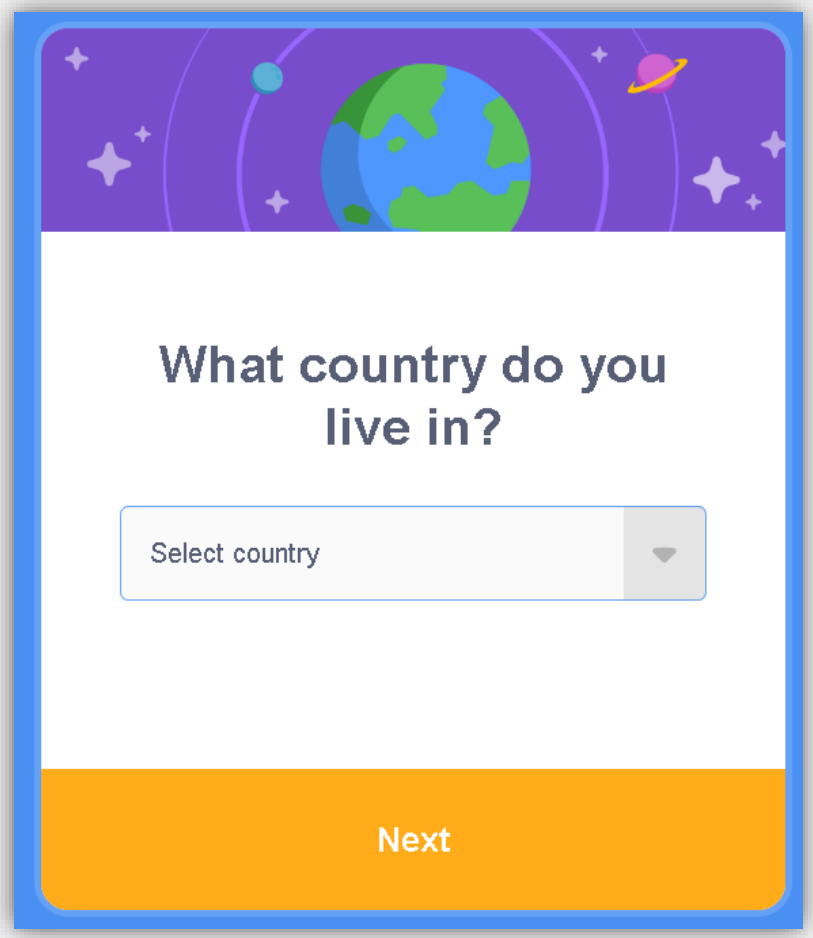


At first, you will need to set up your own account:

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

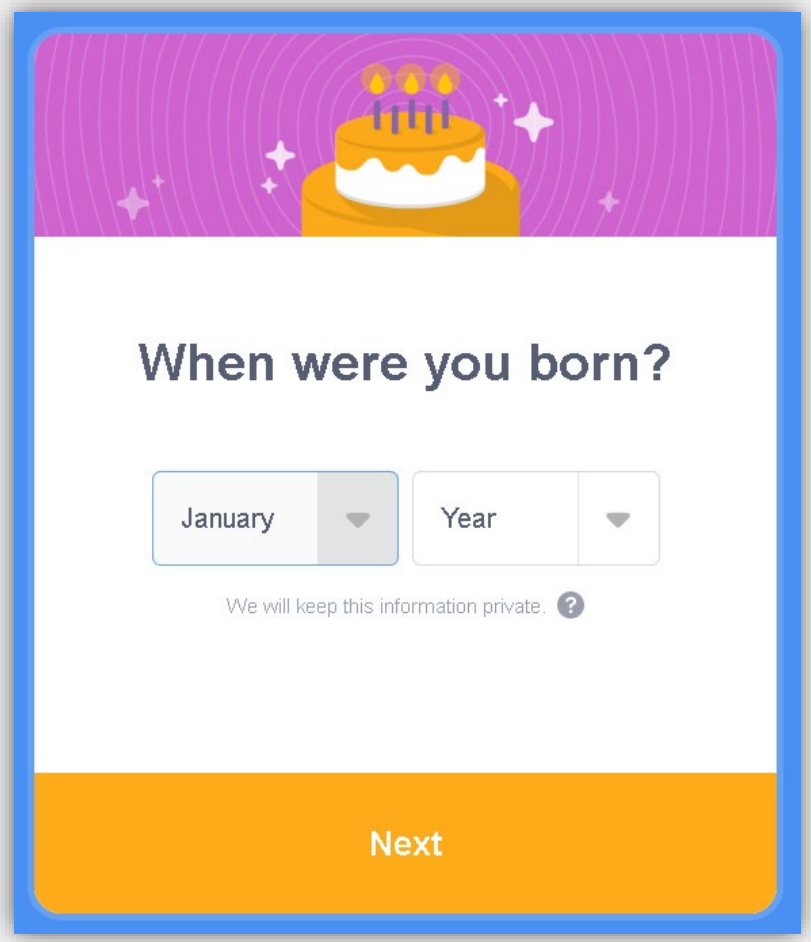
How to get yourself started?



Choose your country:

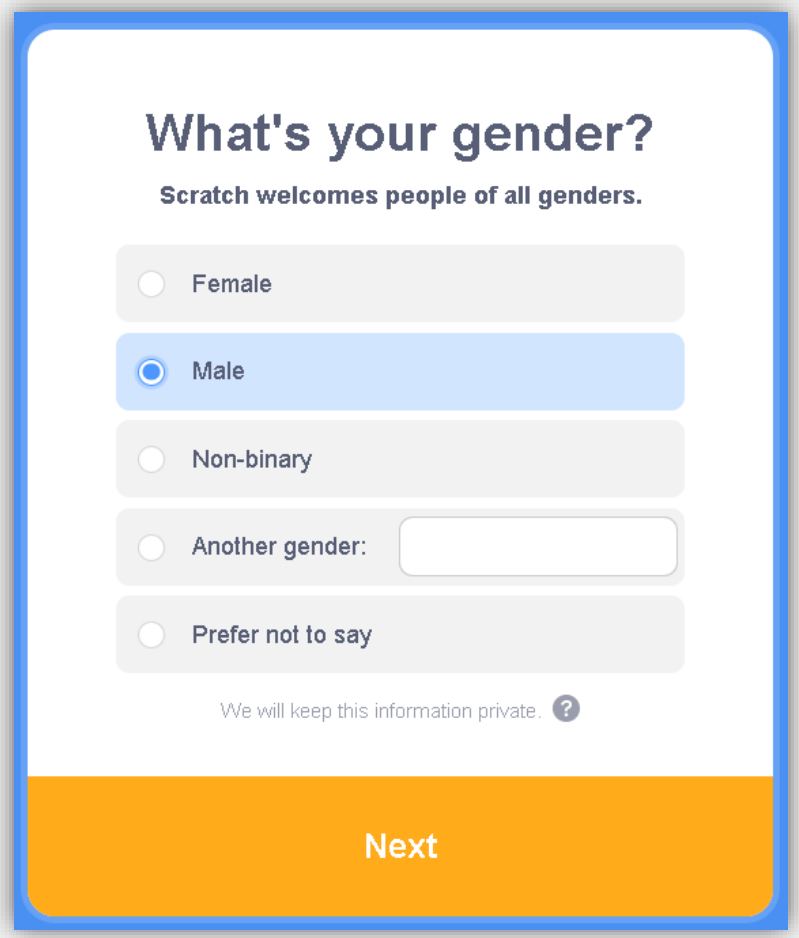
>> I would choose “Malaysia”

How to get yourself started?



Select the month and year when you were born.

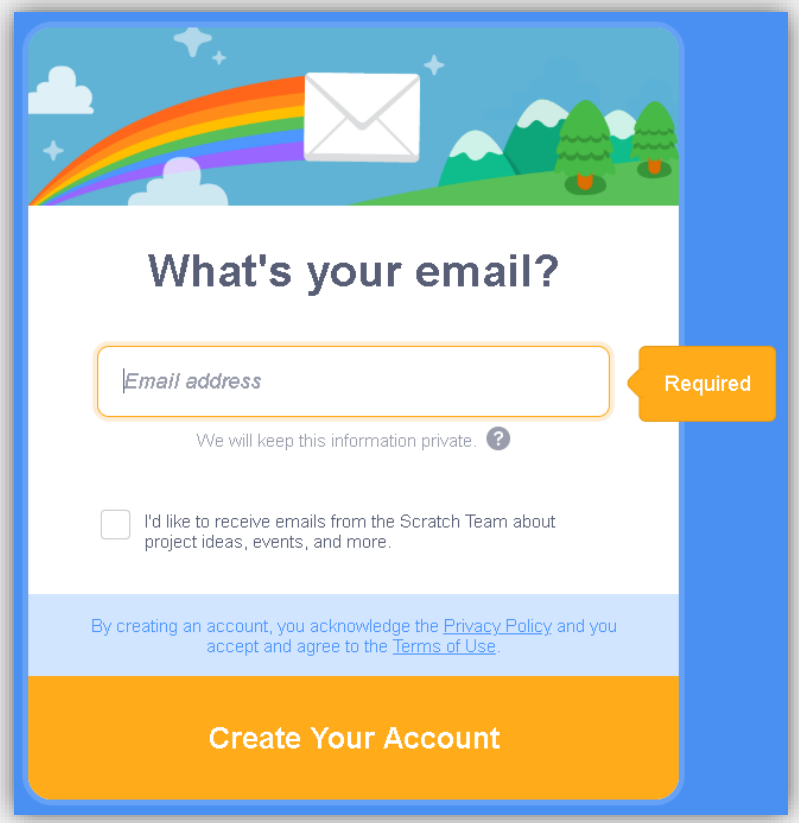
How to get yourself started?



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?

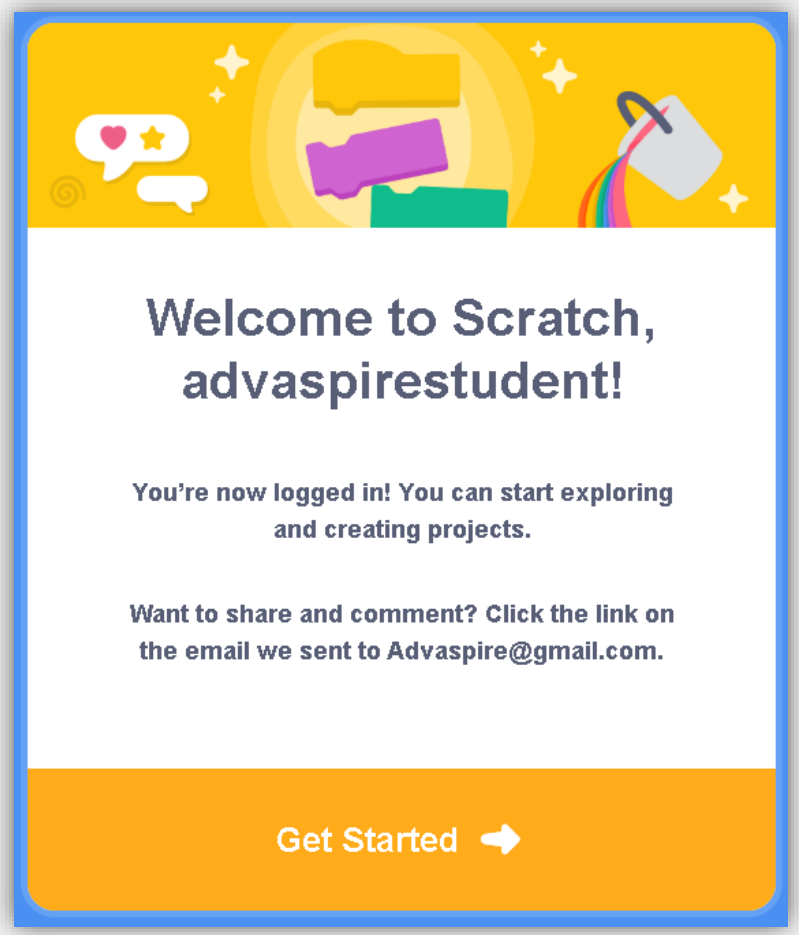


At last, you will need to type in your email address, then click “Create Your Account”.
you can use your school’s email (edu account) to register

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?



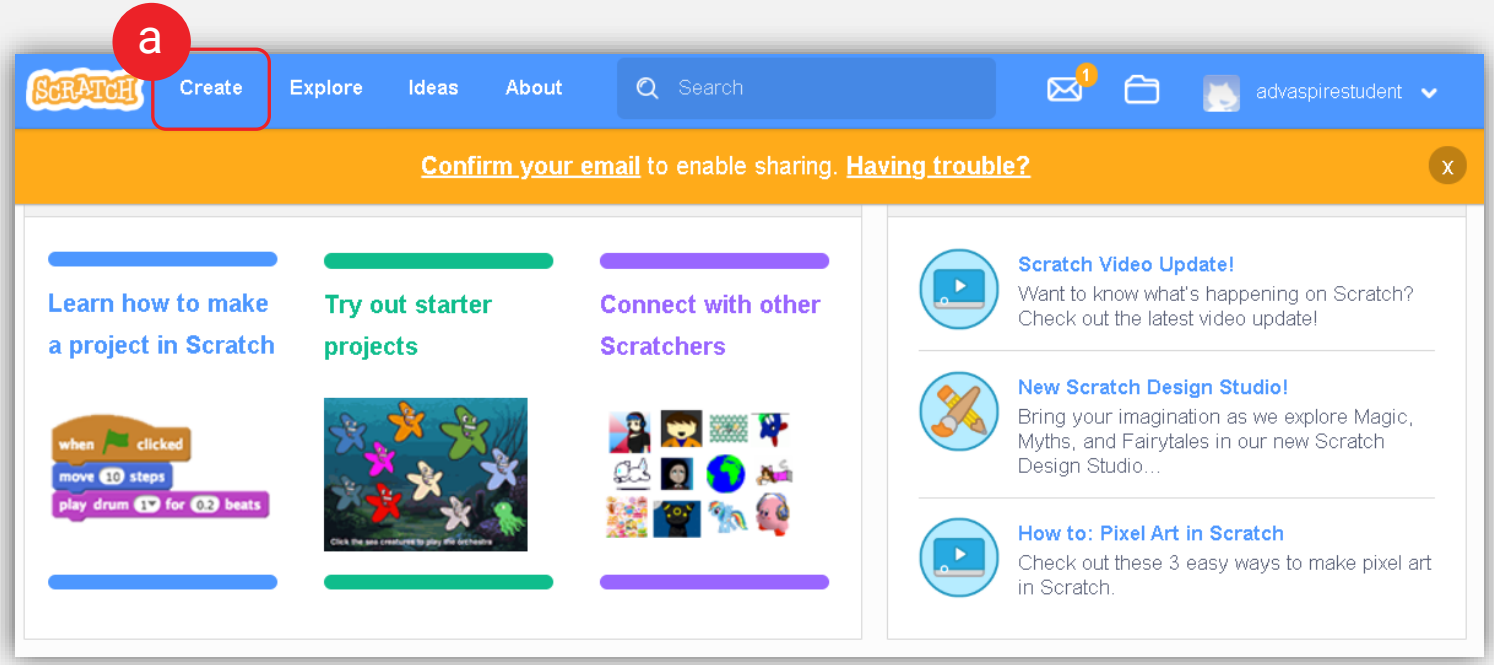
After everything's done, your account is set up successfully.

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



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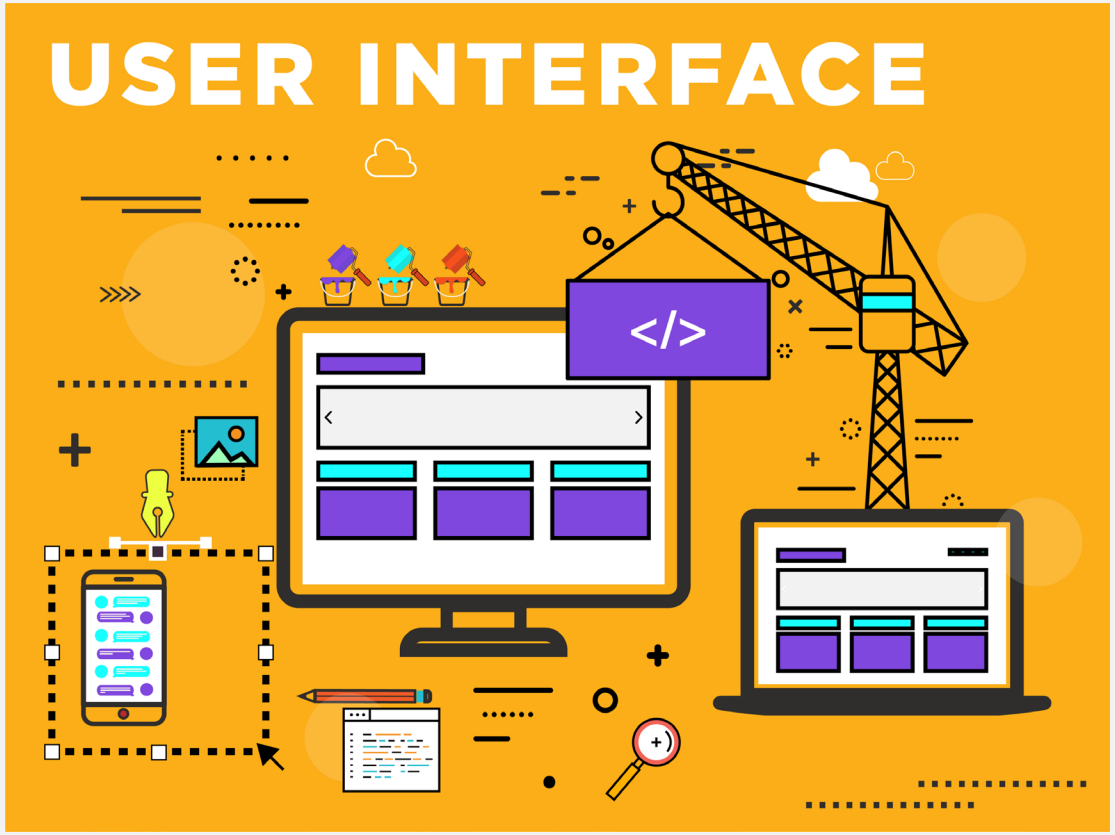
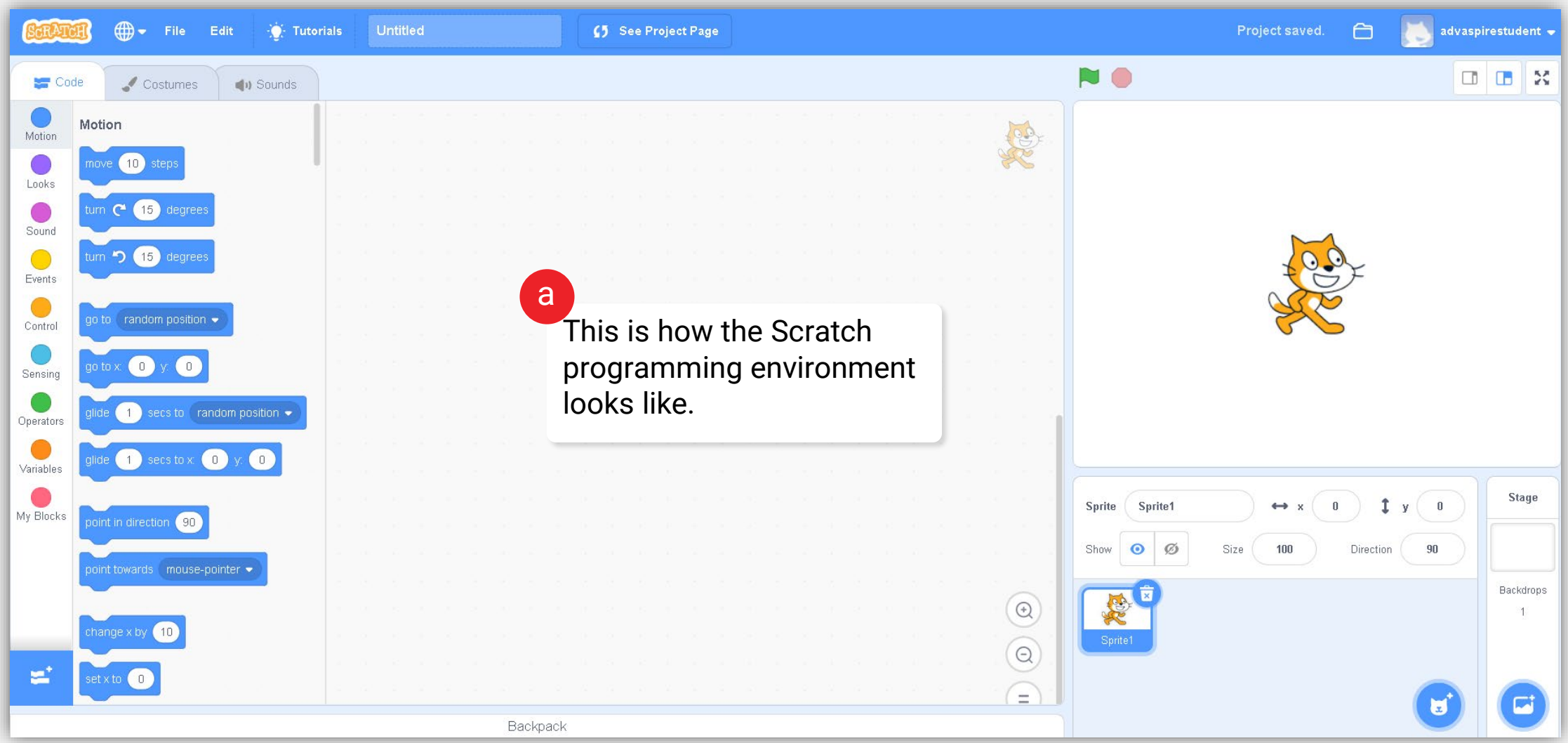
Logged back to your account.

Click "Create" to start your new project.

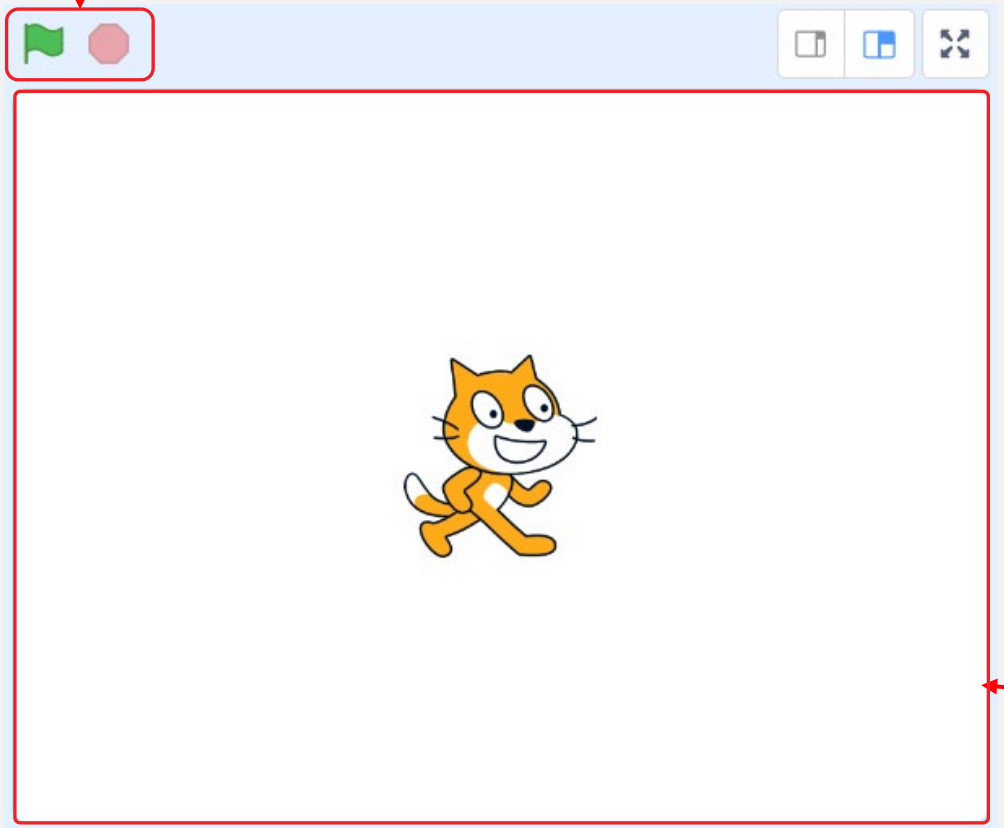
Scratch User Interface



Scratch Programming Environment



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

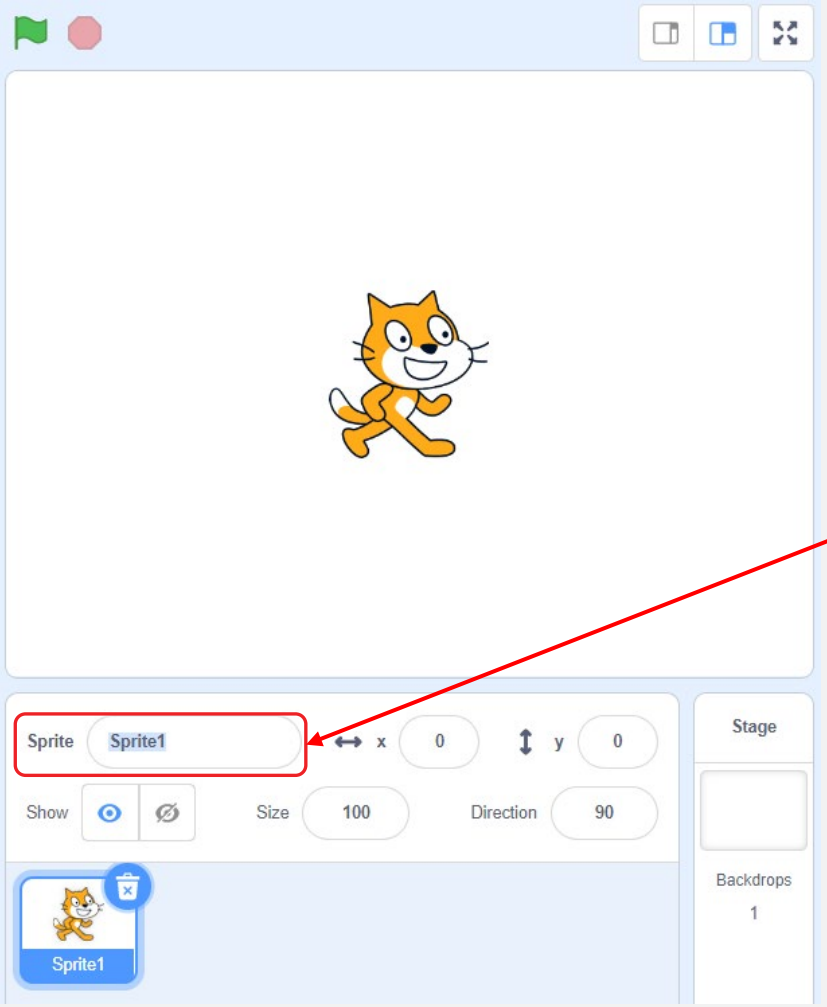
On the top right corner above the stage, there are 3 view mode to select:

-> Programming Space is **bigger**,
Stage is smaller

-> Programming Space is smaller,
Stage is **bigger**

-> No Programming View,
Stage is on Full Screen

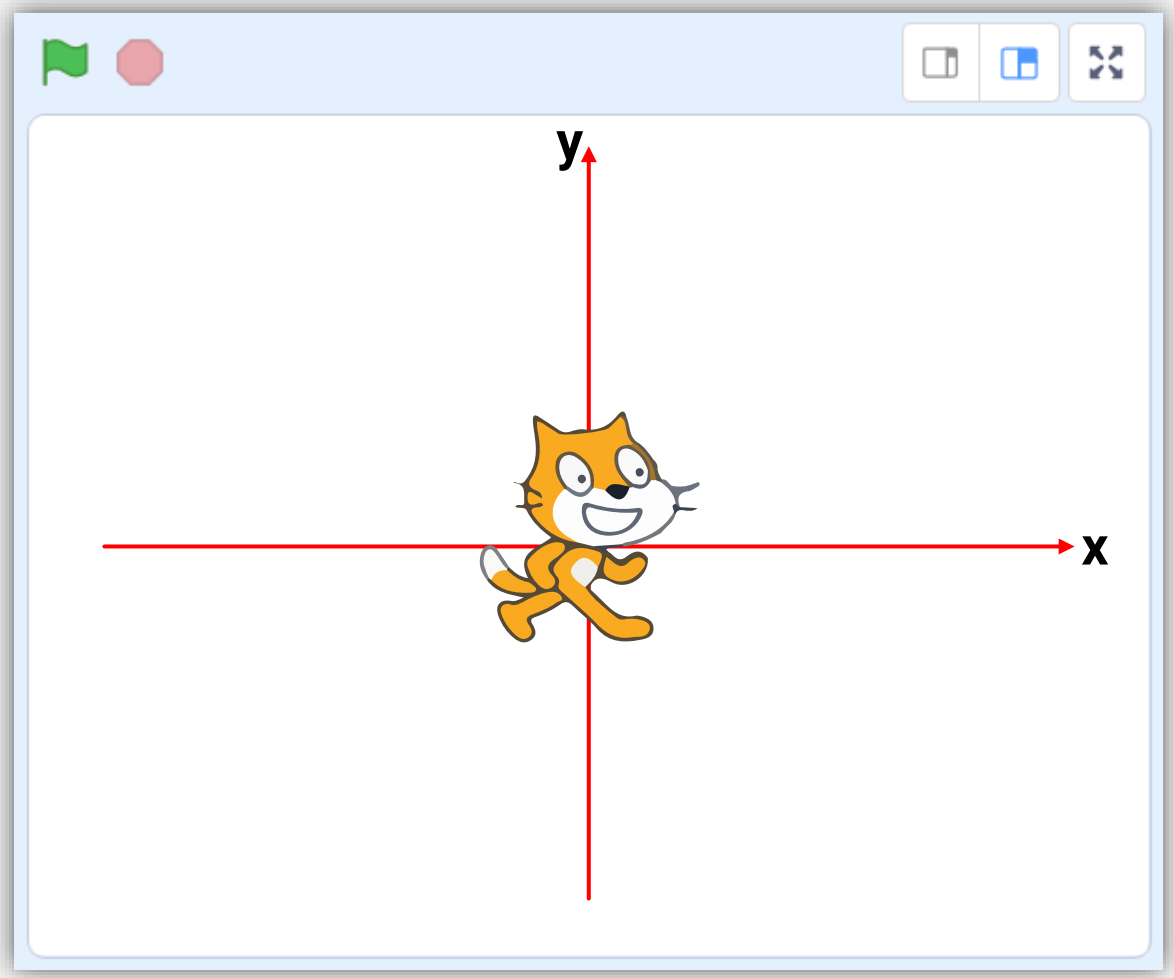
Scratch – Sprite Name



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)

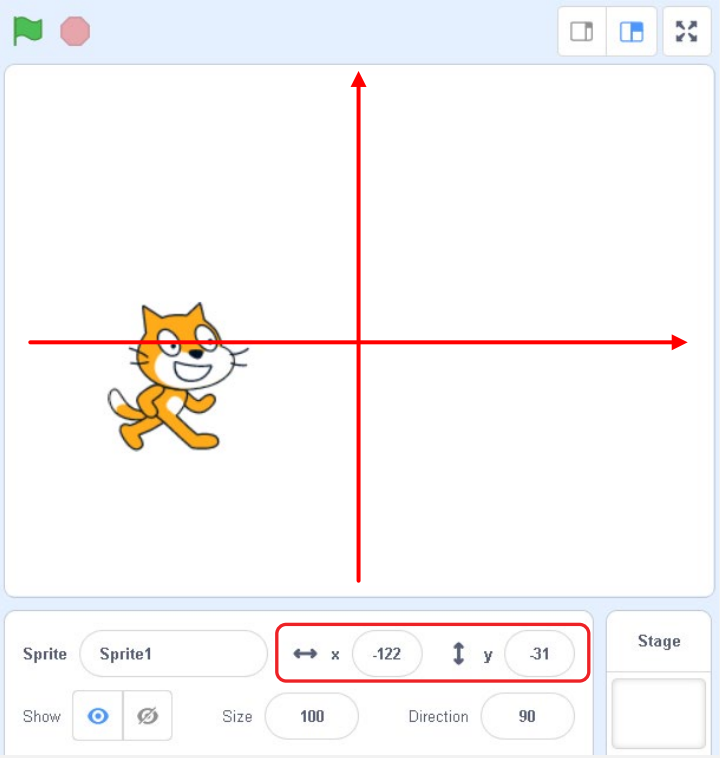
Centre = (0 , 0)

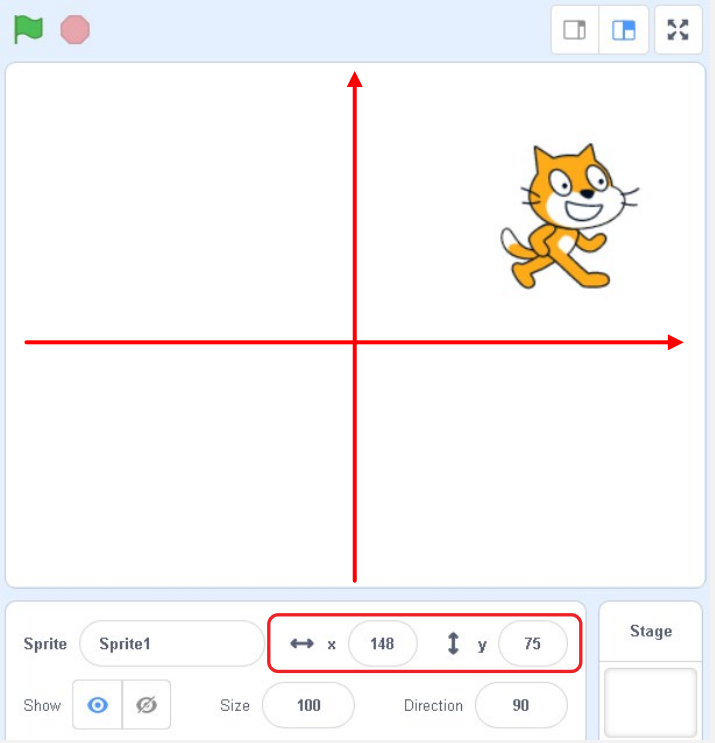
Coordination basically refers to the position of the Sprite.

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

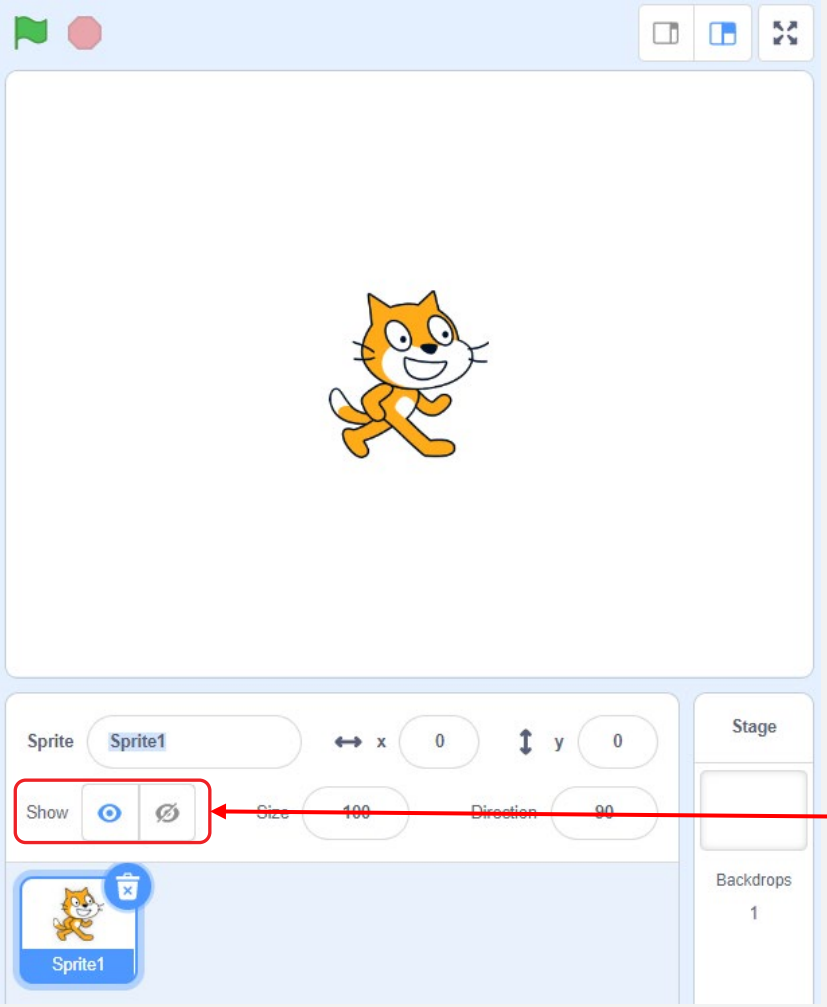
Scratch – Coordinates system





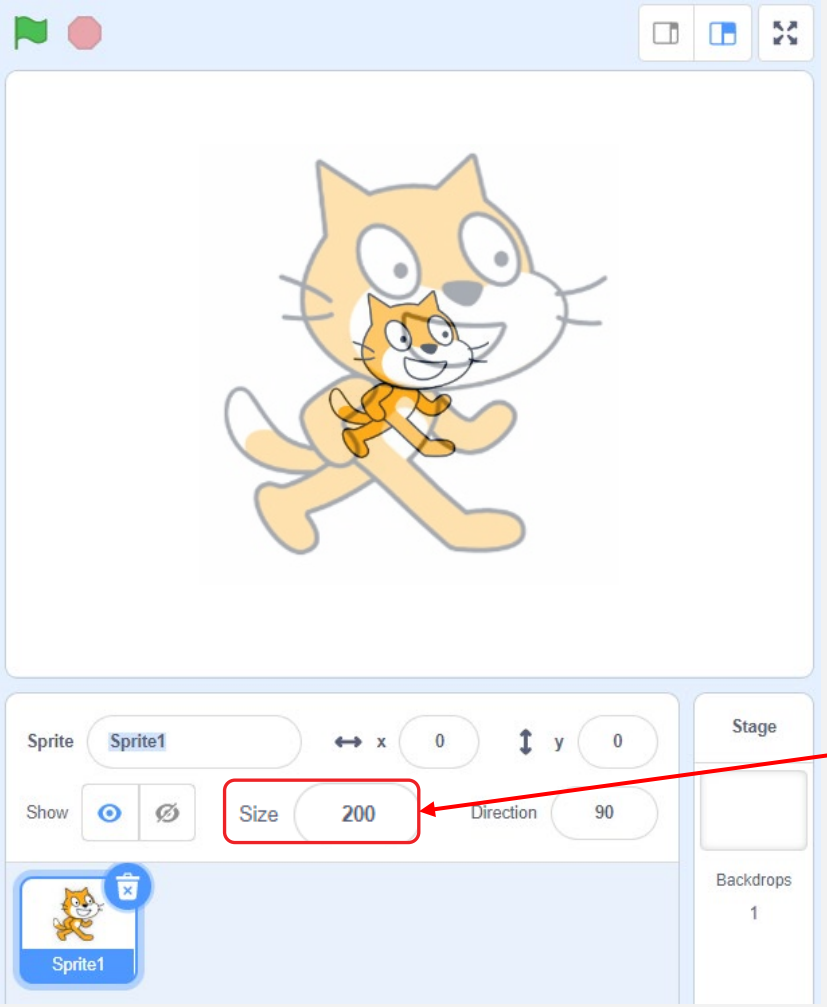
When your object is dragged to different point at the stage, it will show different coordination

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.

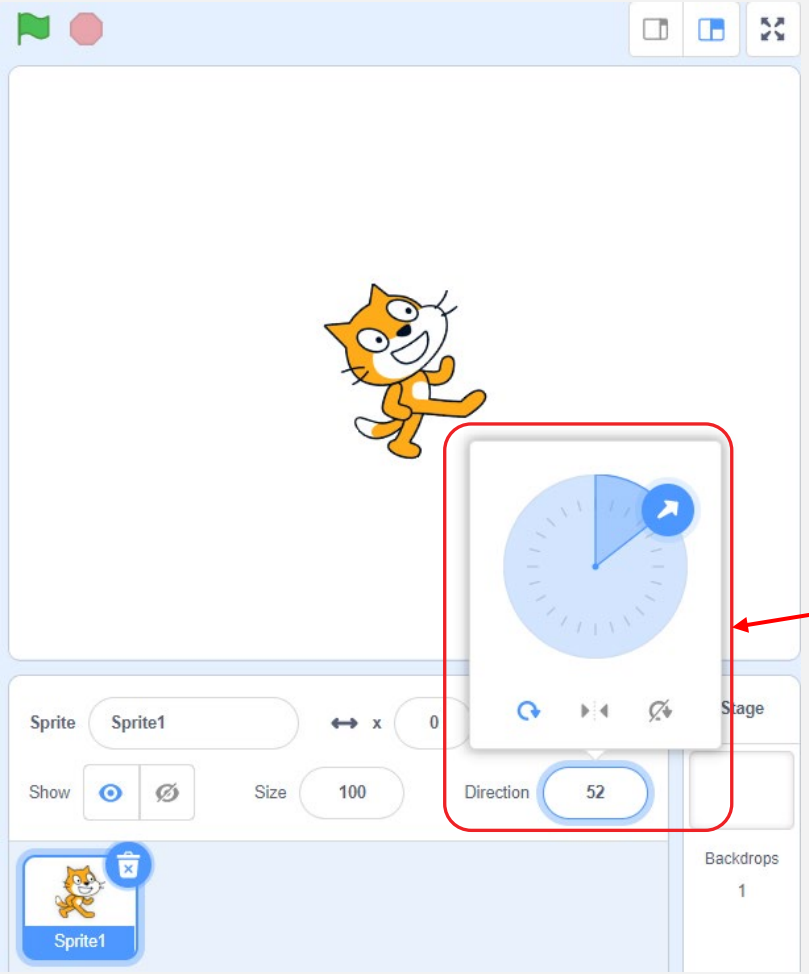
Scratch – Size



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.

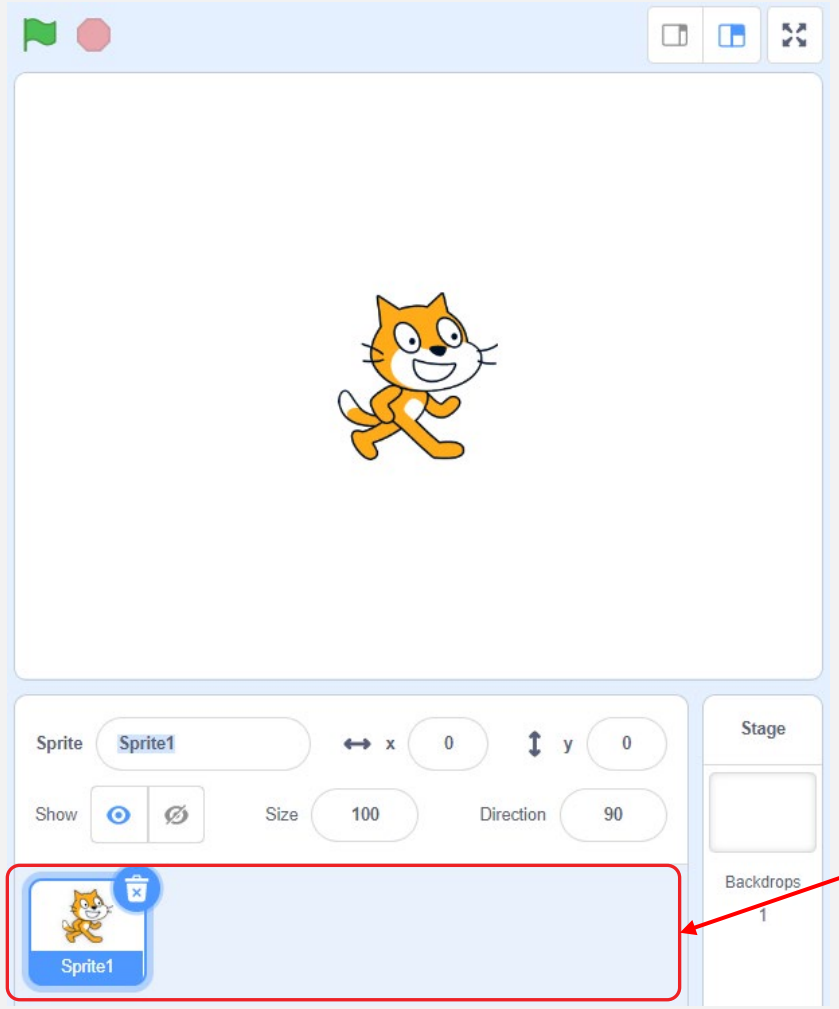
It also offers the options for rotation style:

-> Rotate All Around, your sprite can rotate in all direction

-> Rotate Left/Right only, Sprite either turn left or right only

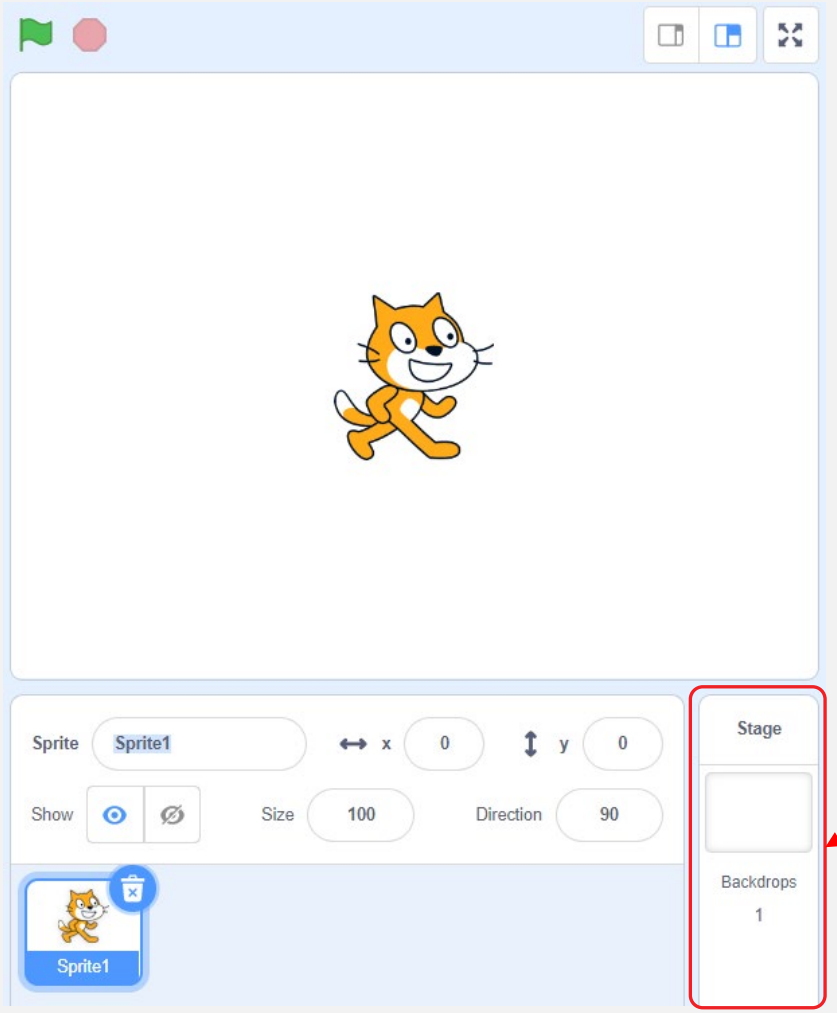
-> Do not rotate at all, Sprite is fix without rotation

Scratch – Sprites



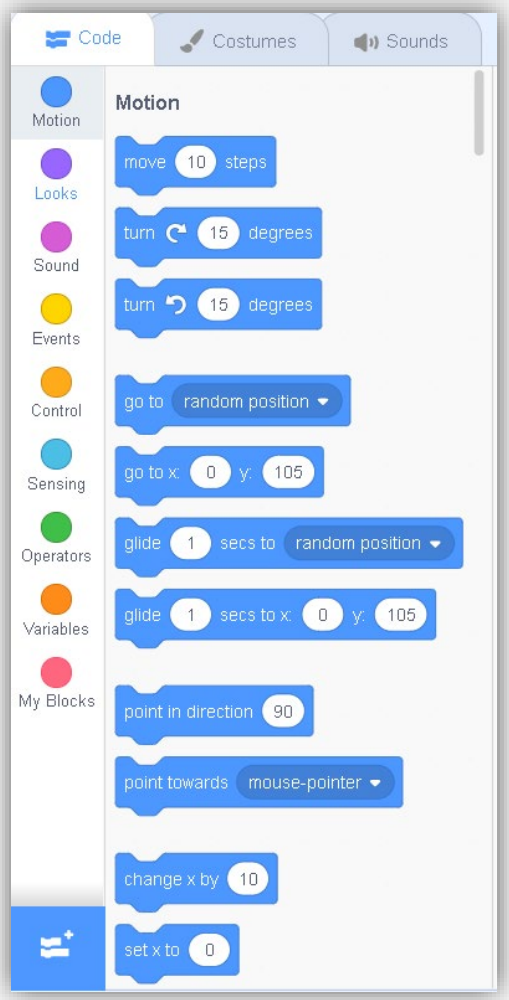
Whenever a new sprite is added, it will be shown in this section with the sprite name.

Scratch – Backdrops



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

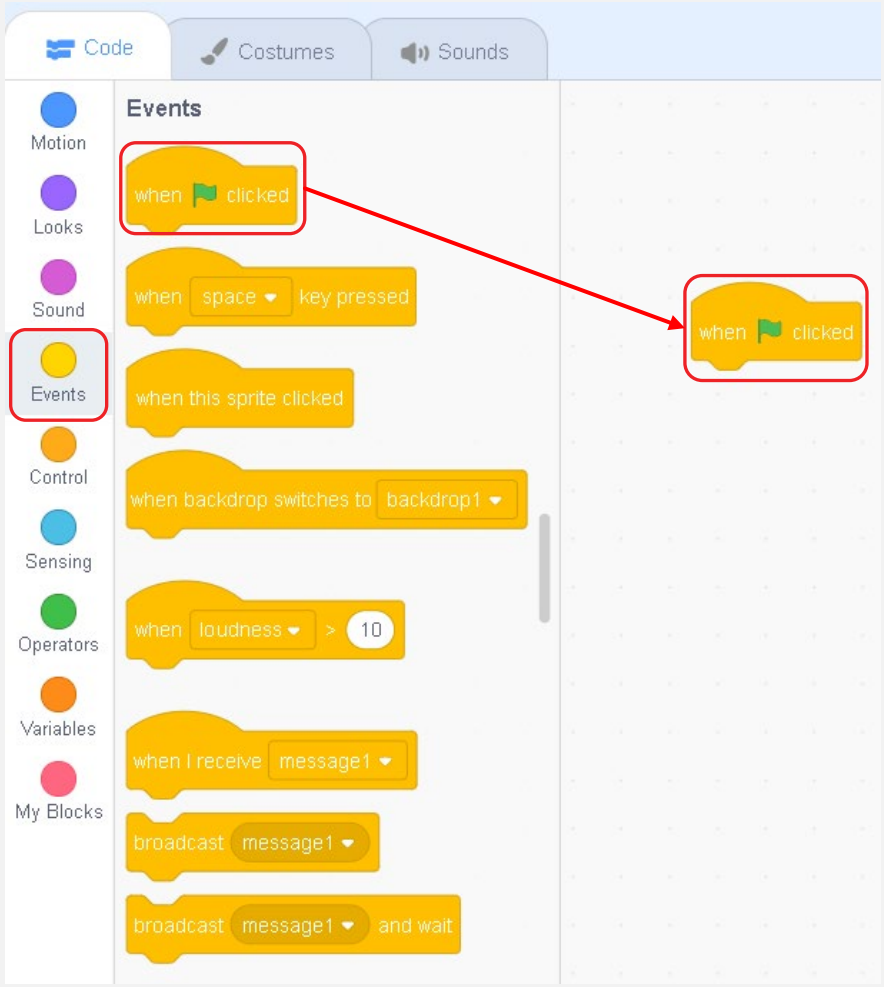
Scratch Programming Blocks - Types



Programming Block Types >>

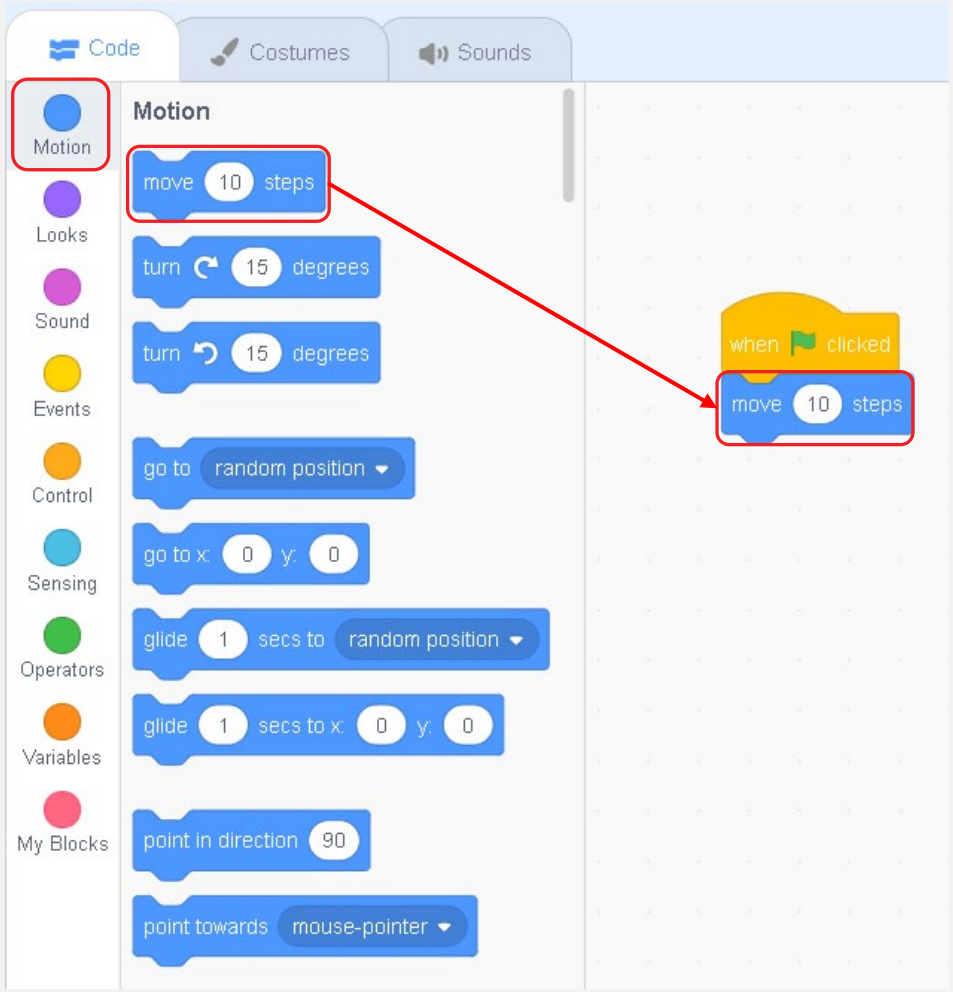
Motion – Control movement of the object
Looks – Control the appearance of everything
Sound – Control sound(s)
Events – Set up something to trigger the action(s)
Control – Function purpose (if … else …, wait, loop, repeat until)
Sensing – Use like a sensor
Operators – For mathematical Calculation
Variables – 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.

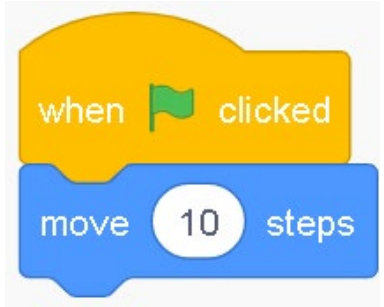
Scratch Programming Blocks - Move

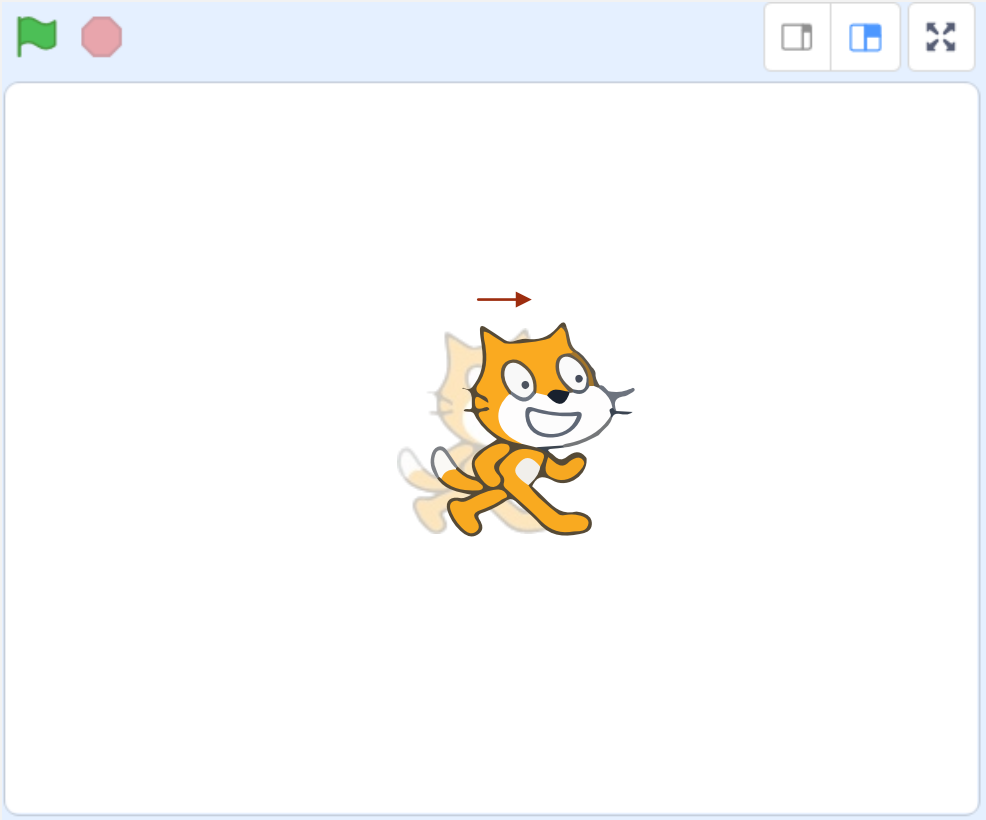


Go to “Motion” category and drag “move 10 steps” and attach it below the “when flag clicked” block.

Scratch Programming Blocks - Move

Script:



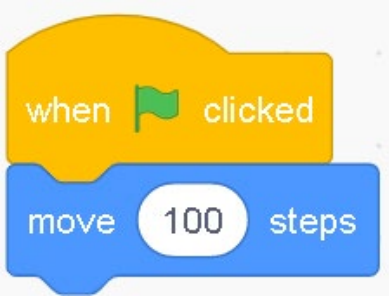


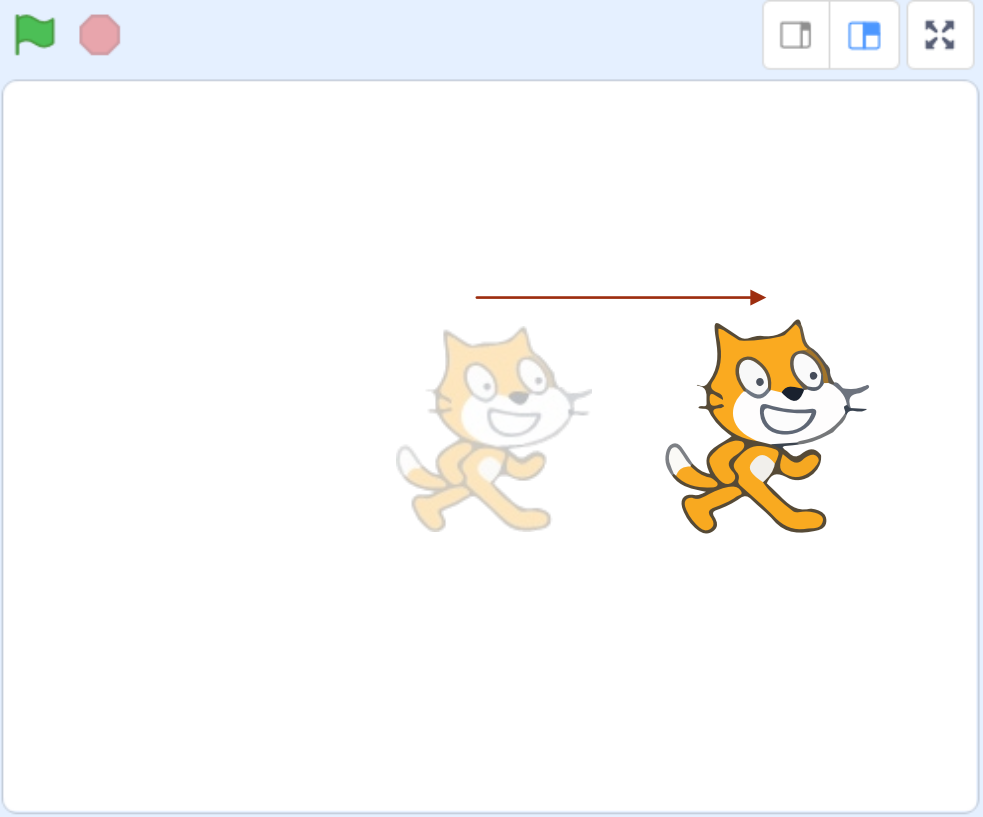
By giving a script as shown >>

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

Scratch Programming Blocks - Move

Script:

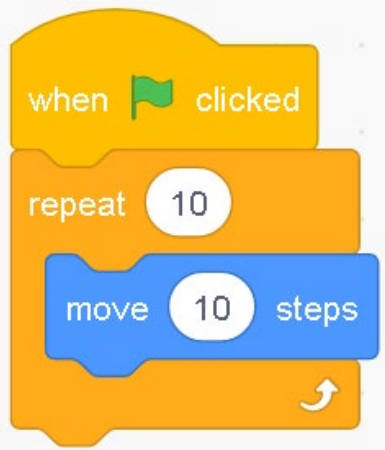


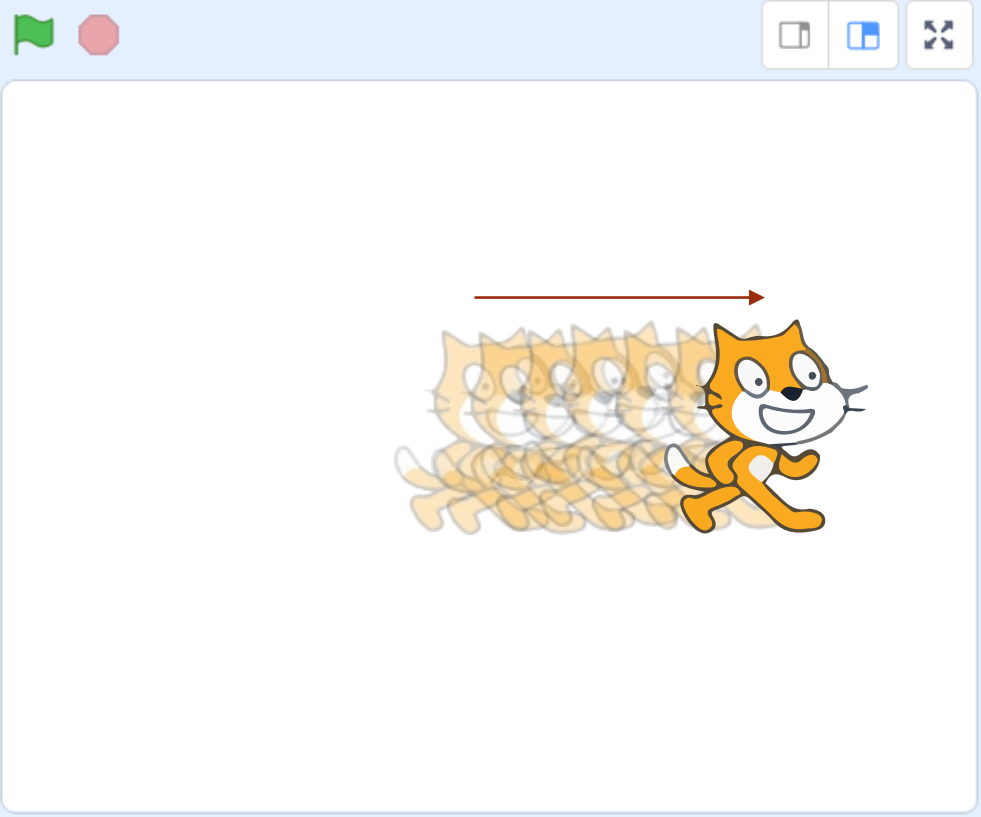


If you change “10” to “100”, You sprite (Cat) will straight jump forward for 100 steps.

Animation Moves

Script:



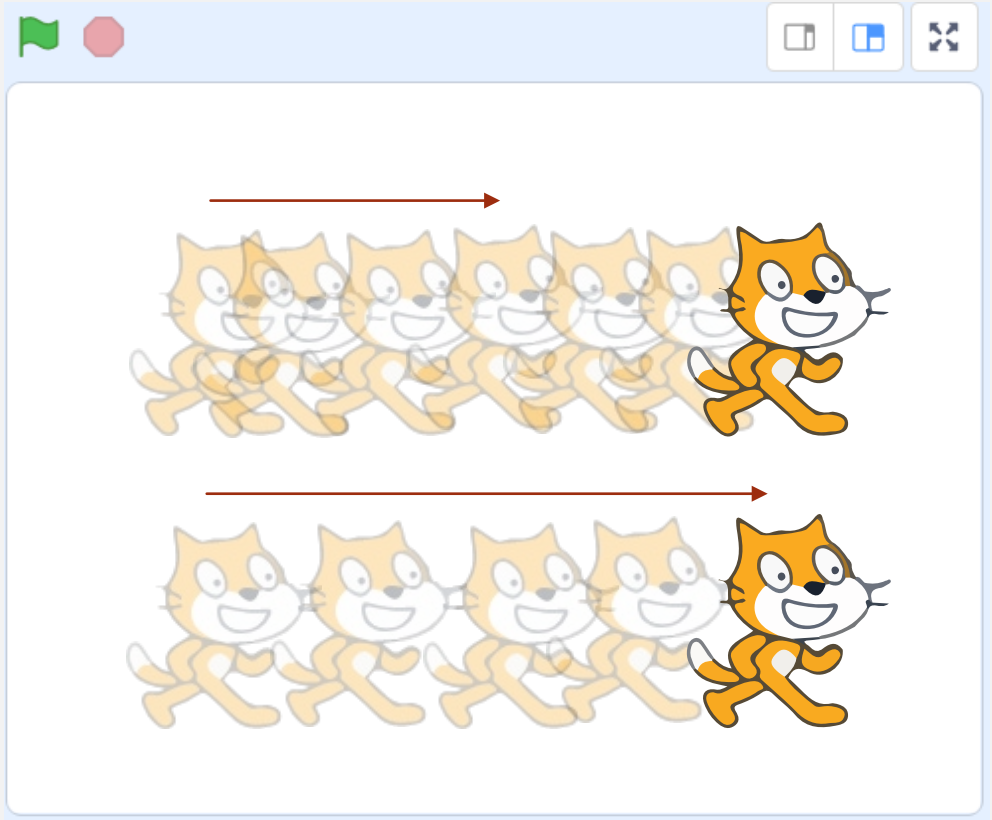


To make animation move, you need to make the steps repeat for few time.

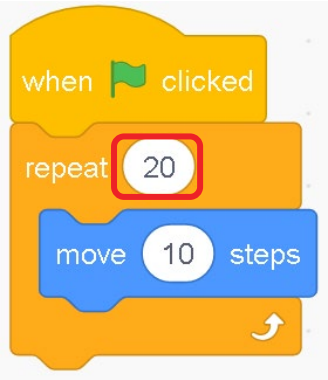
>> Move forward for 10 times, each time moving 10 steps. Total travelling distance = 100 steps.

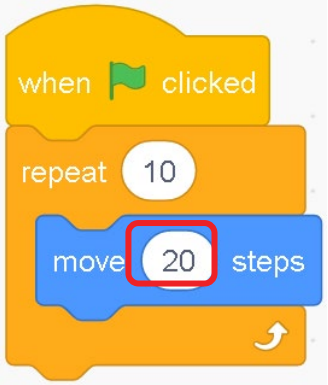
1 repeat block processing time = 0.03 second

Faster or Further?



Script:



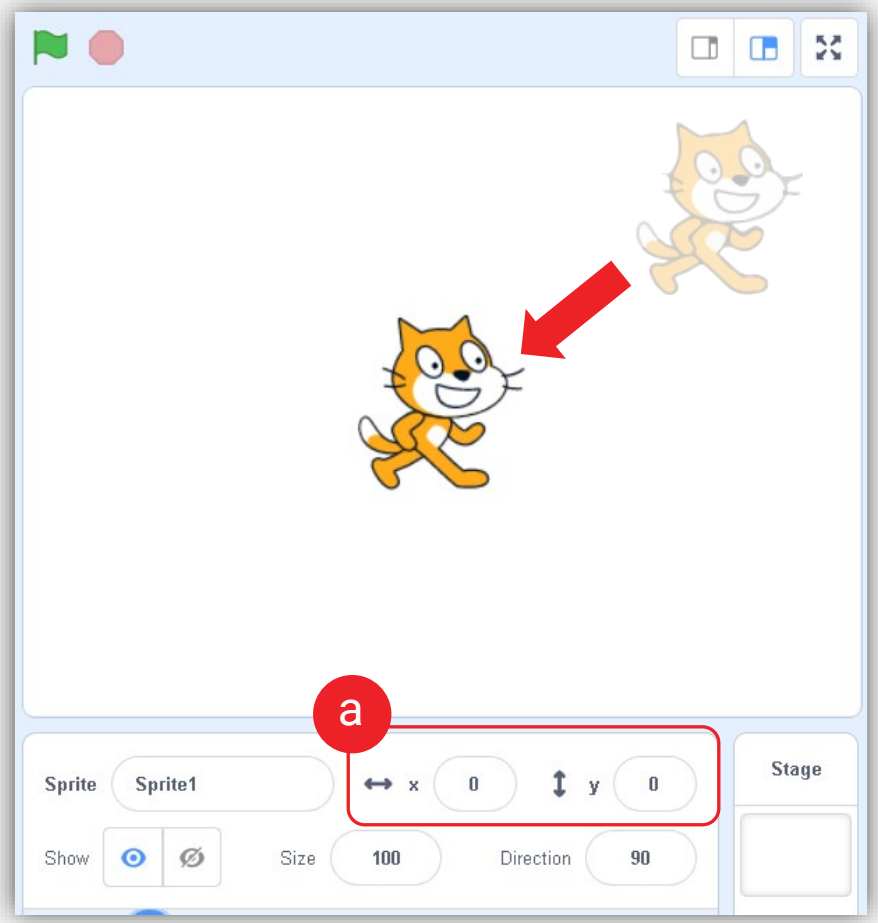


If you put higher value in repeat block (without changing the move steps), the cat should move further.

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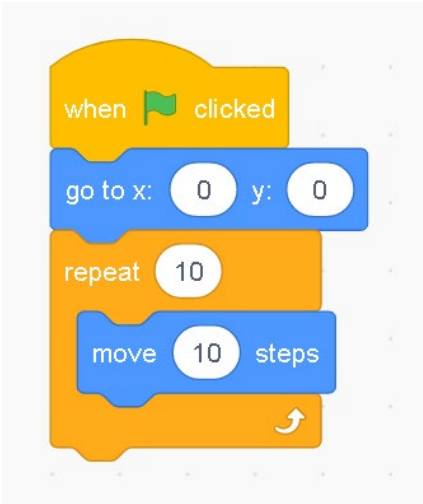
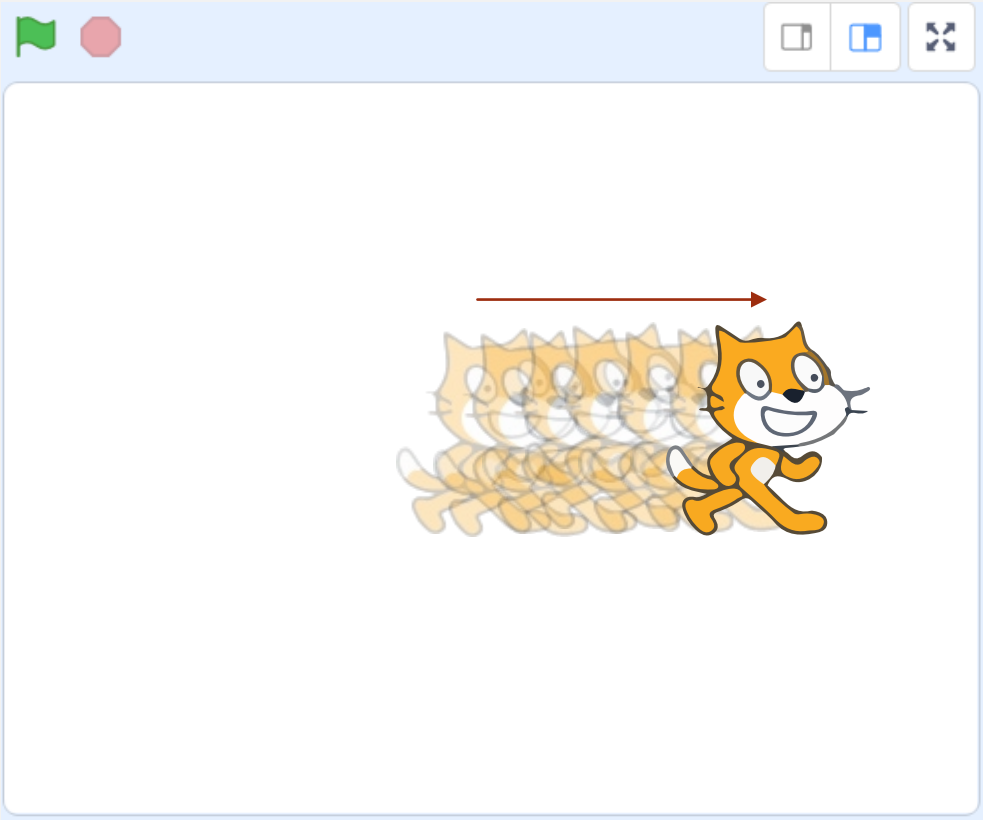
When you want your cat to go back to the center position before you click the "flag" button, you can adjust directly by changing the value of x and y to zero.

Set your starting position

Script:



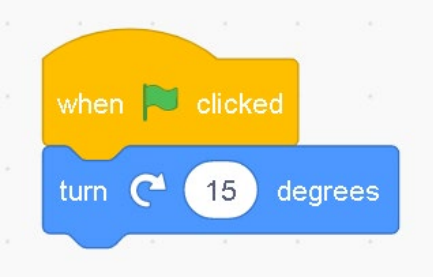


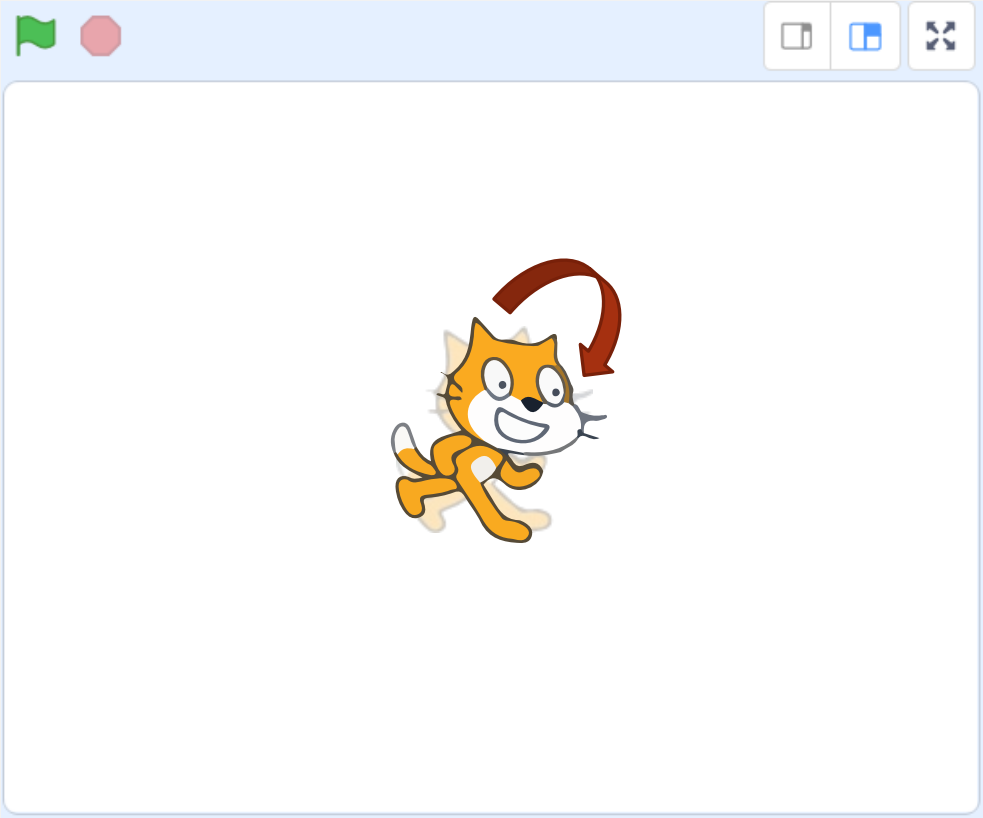
To make your object always starts from the center (0,0), you need to:

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

Turning Direction

Script:



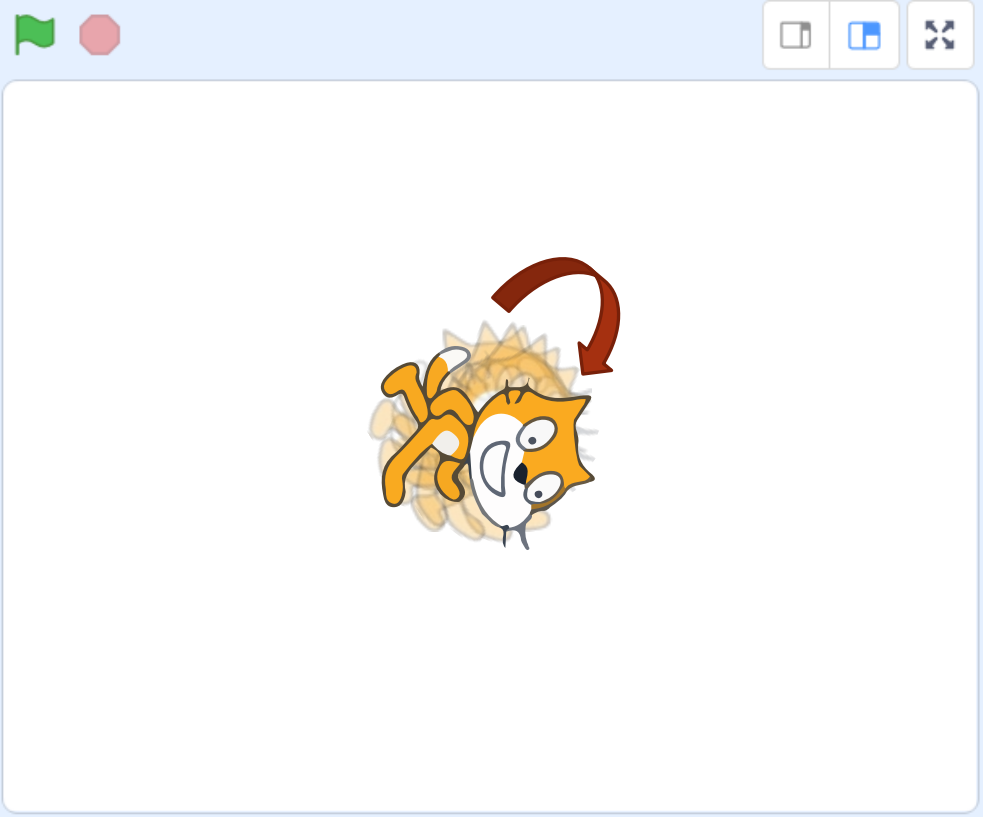


From start, your object will face
90°.

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

Turning Direction

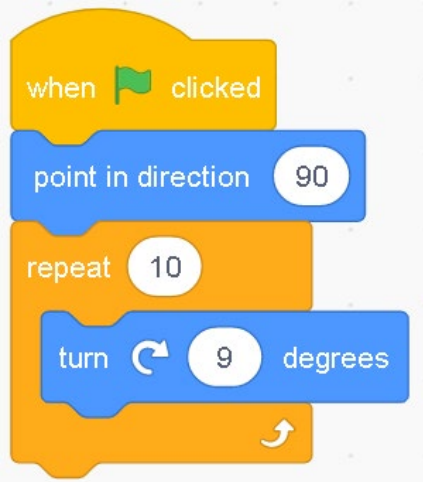
Script:

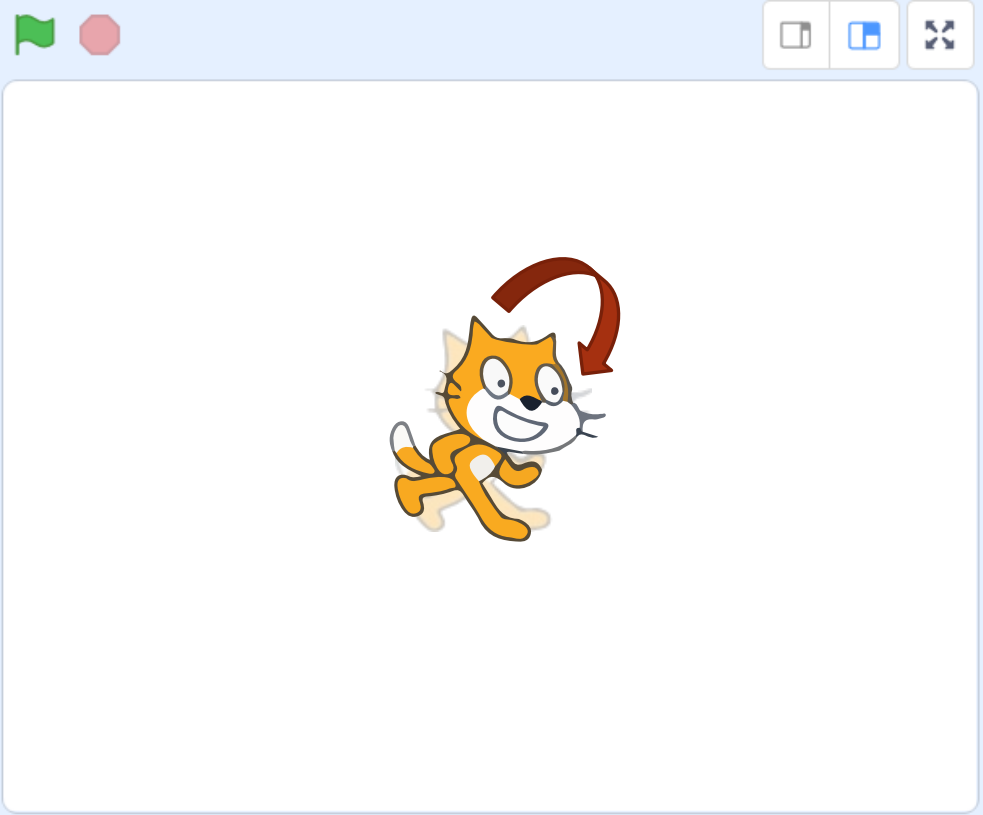


If you want to make like a motion when doing 90° turn, you can add the repeat block and repeat 10°for 9 times.

Set Starting Direction

Script:

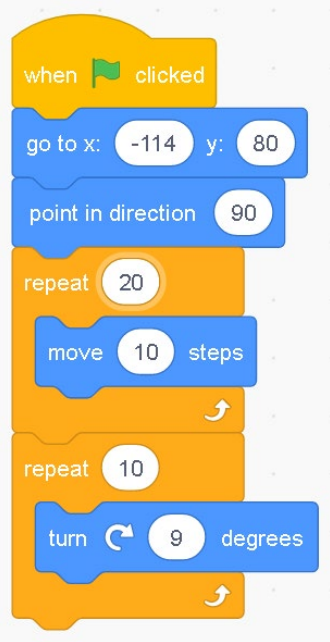


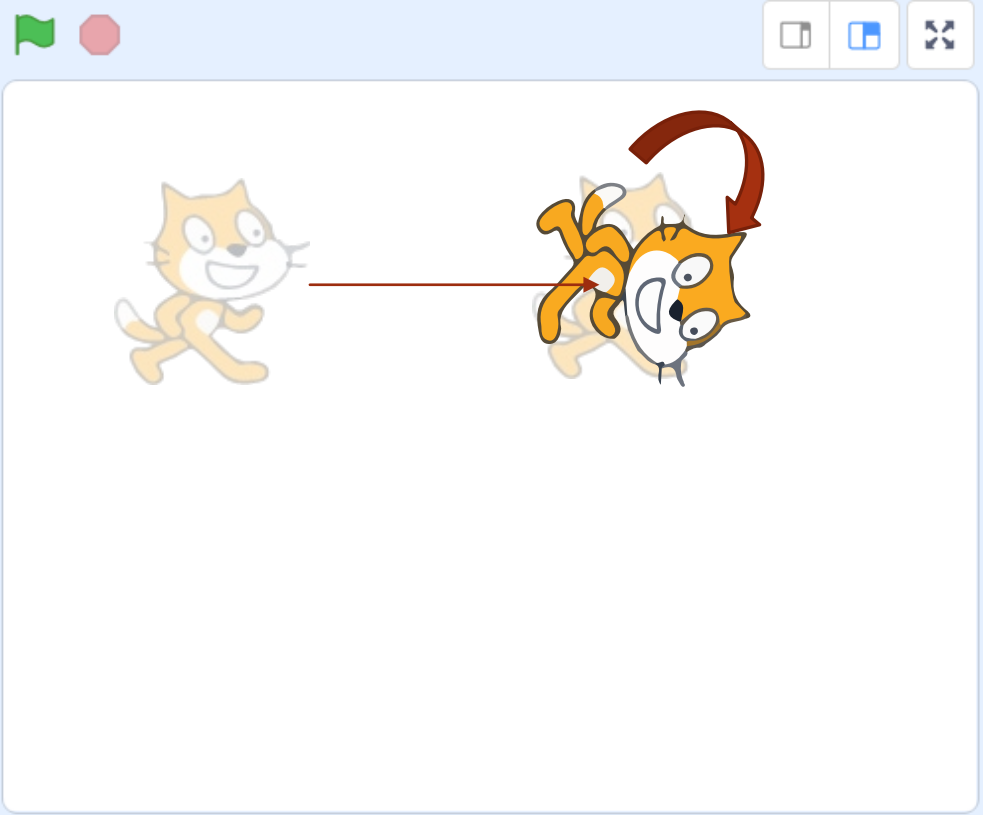


To set your starting direction, you can place a "point in direction" block before you start the turning motion.

Combining Actions

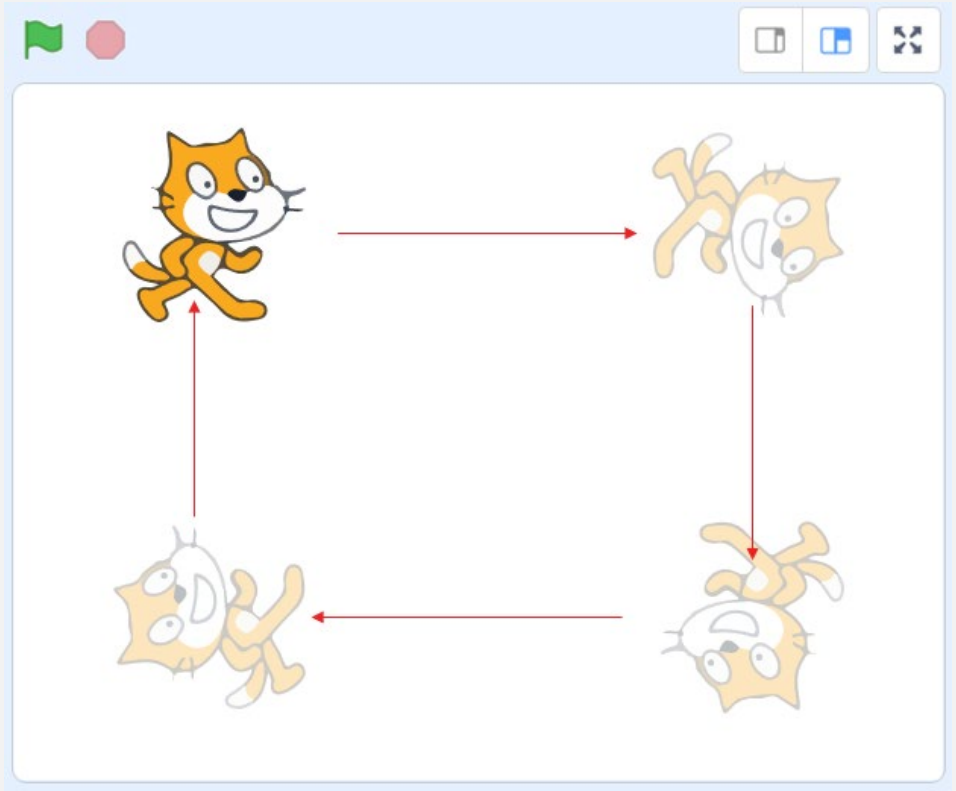
Script:





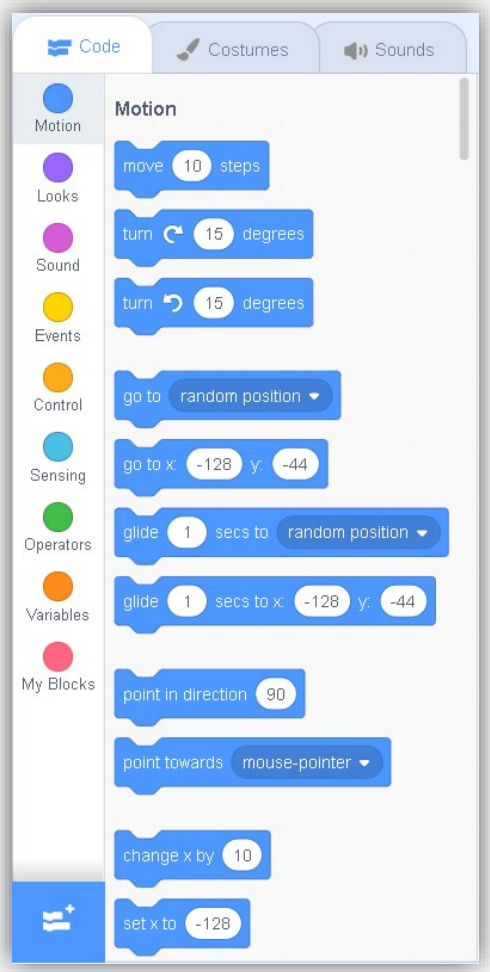
You can combine the blocks together to make the motions.
This is to make the cat move front 200 steps from the starting position then turn 90°

Challenge - Move in Square



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

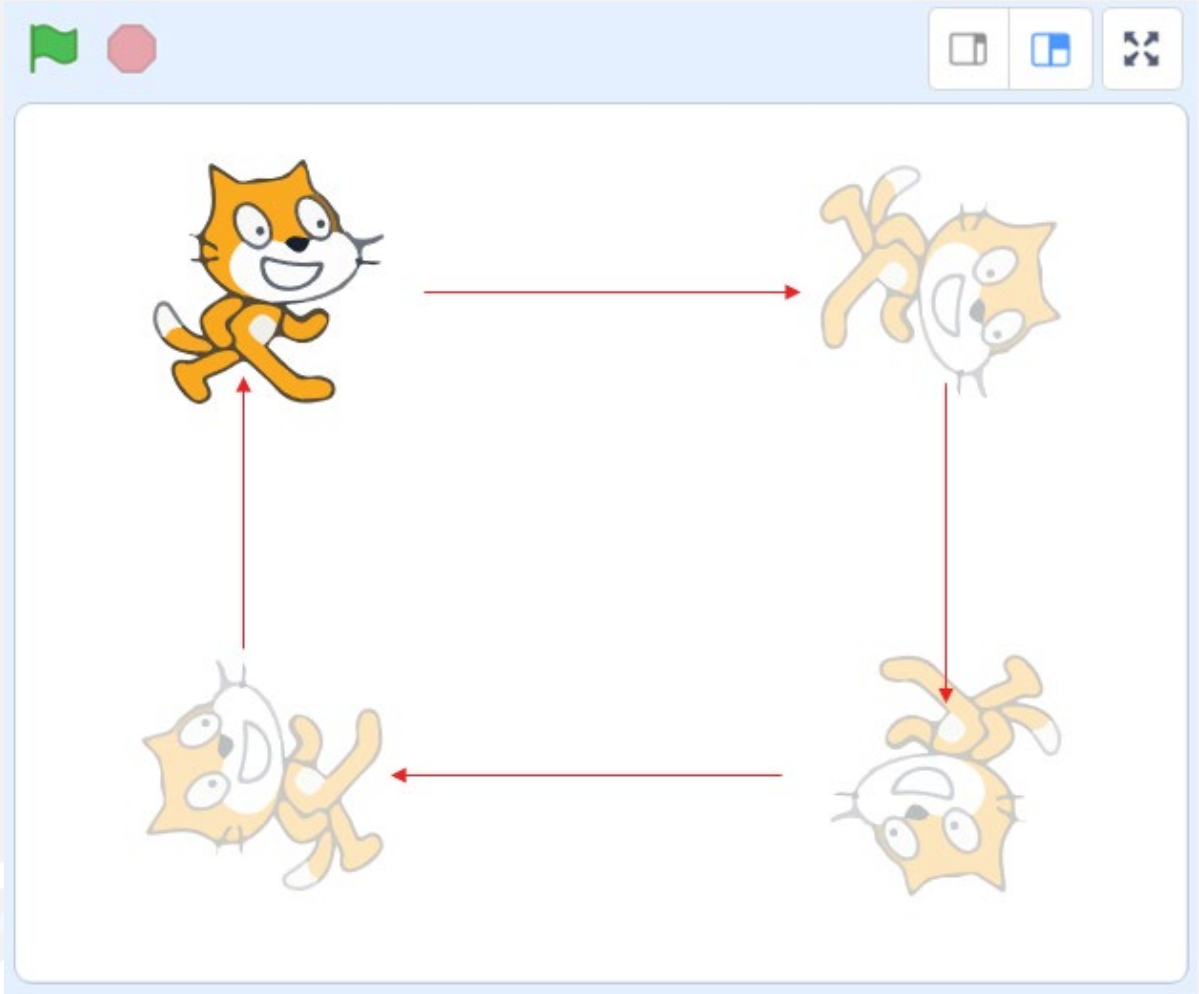
Test out other blocks



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.

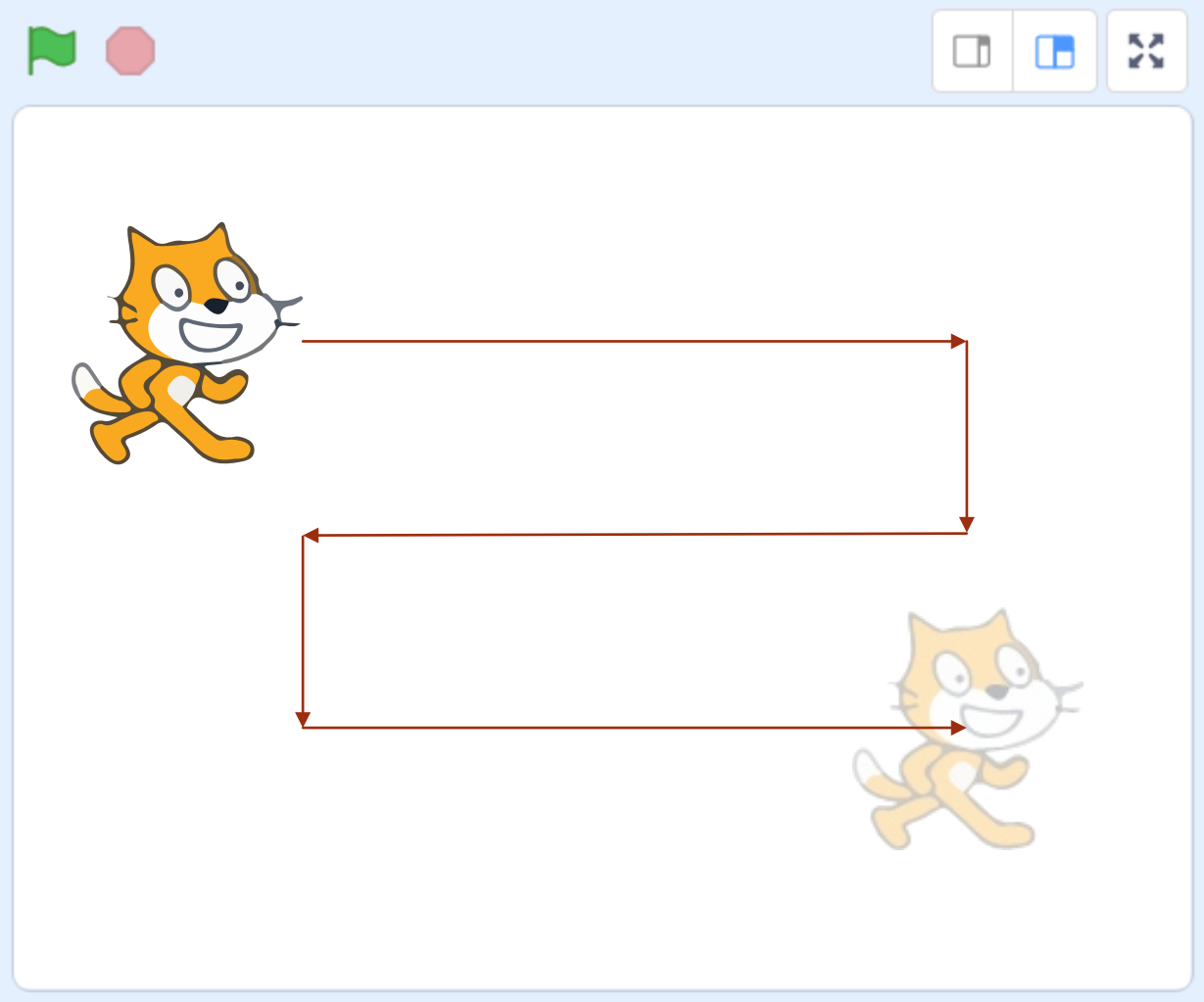
Mission *for*

Topic 1.1



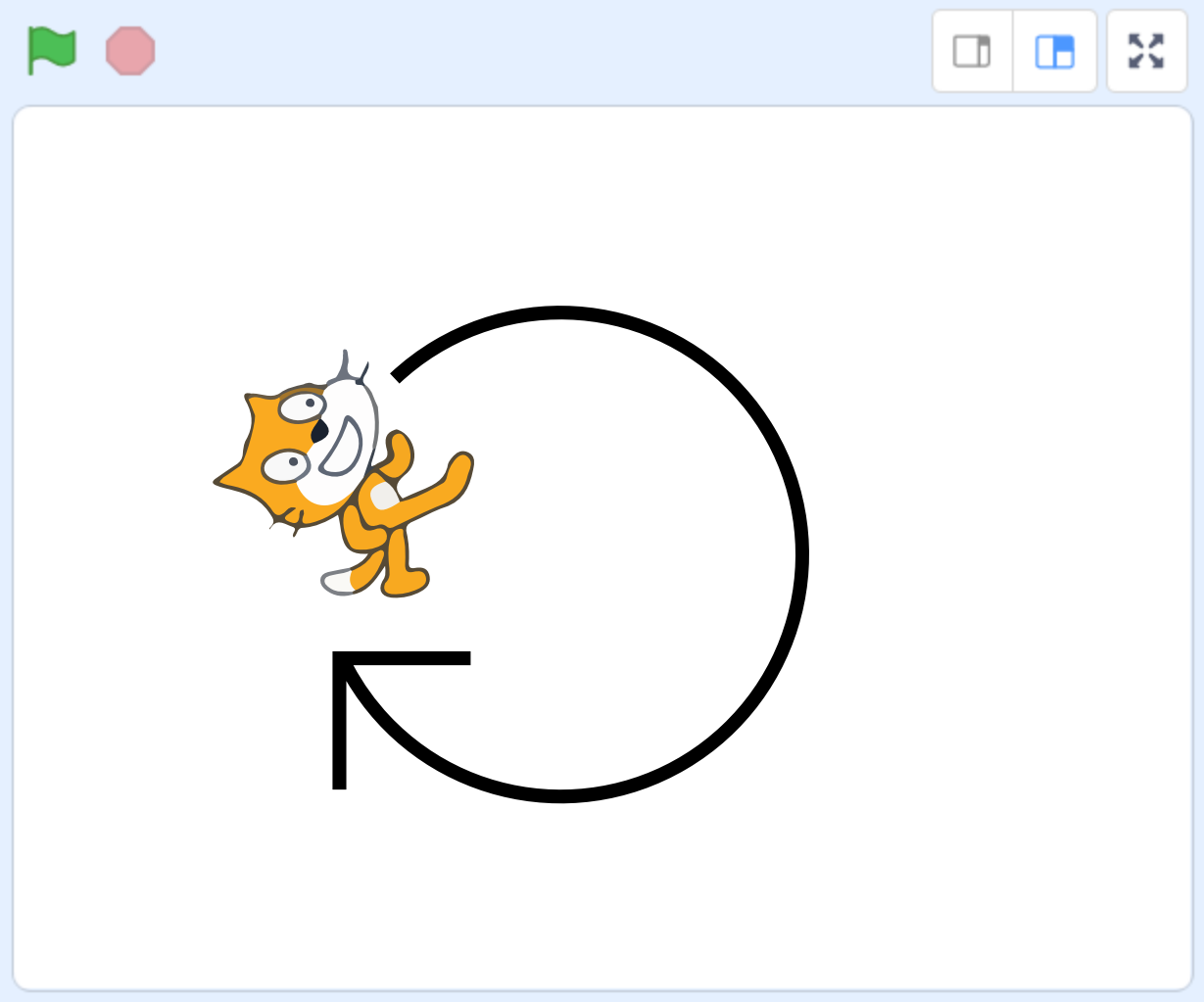
T1.1 – Mission 1

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 :)