



Scratch Programming

Lesson 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. Basic Movement Program**



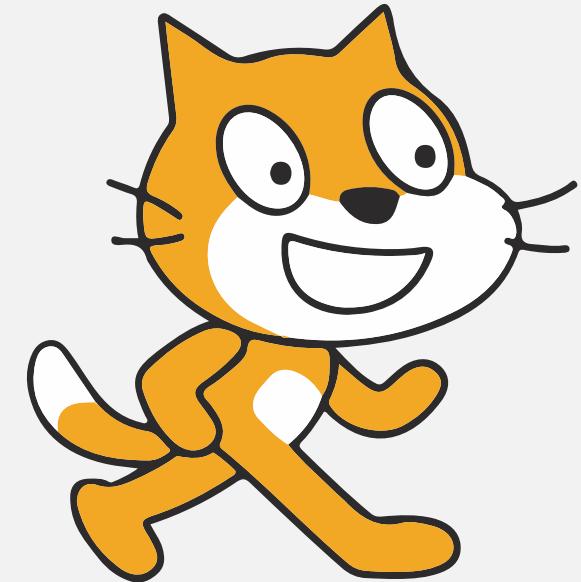
Learning Outcome

- 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**



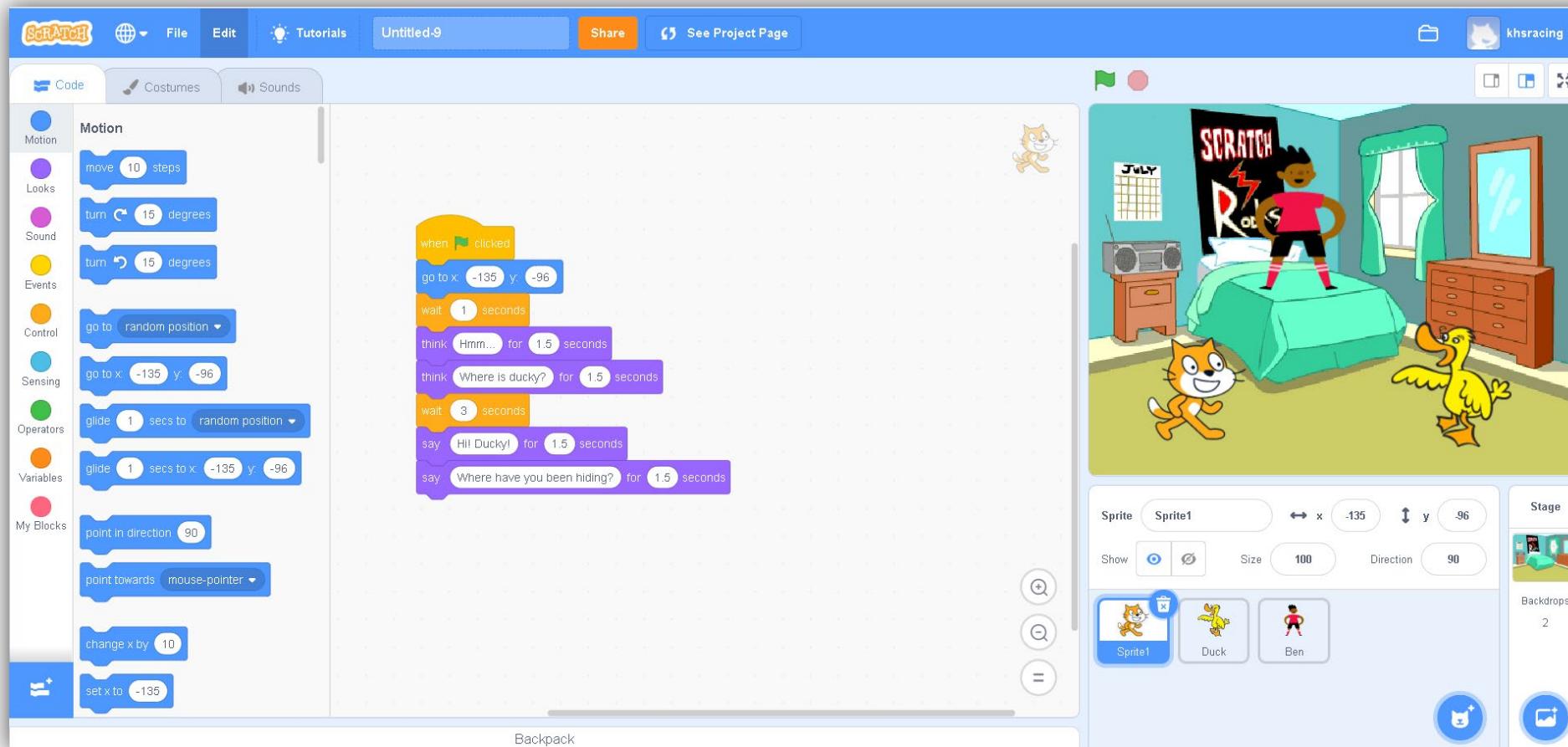
What is Scratch Programming?

SCRATCH





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



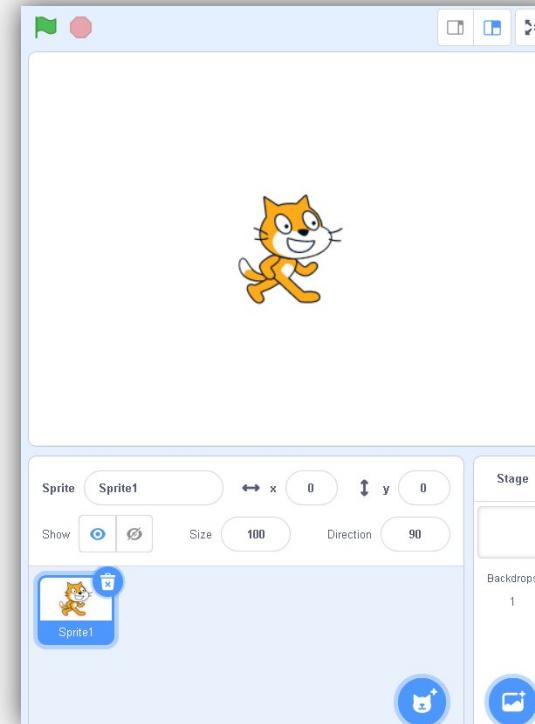
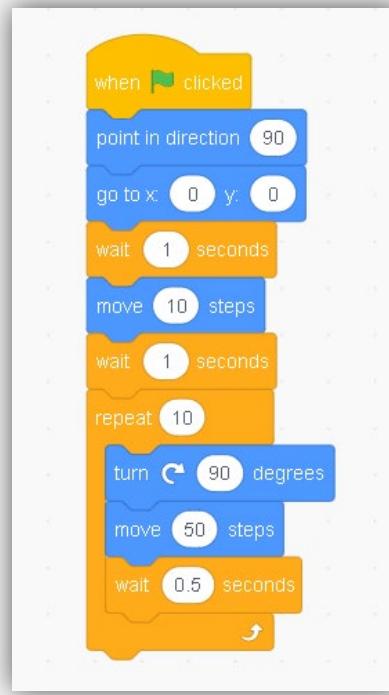
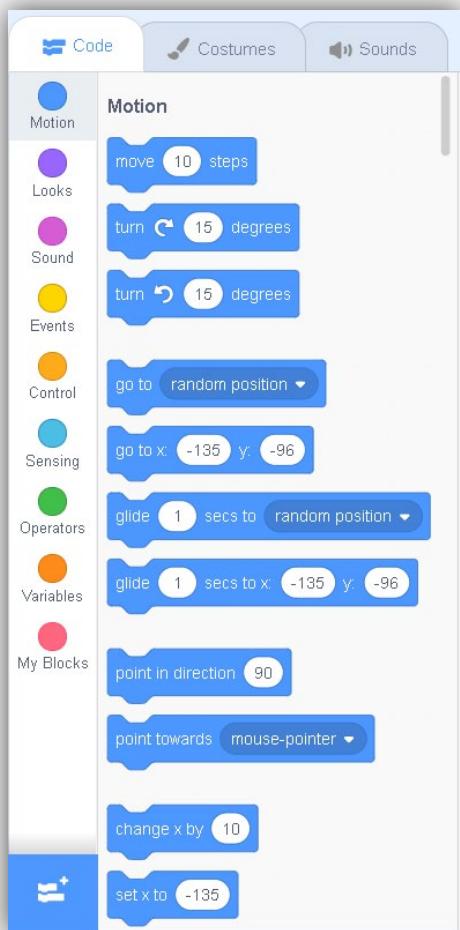


Why learn Scratch Programming?





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



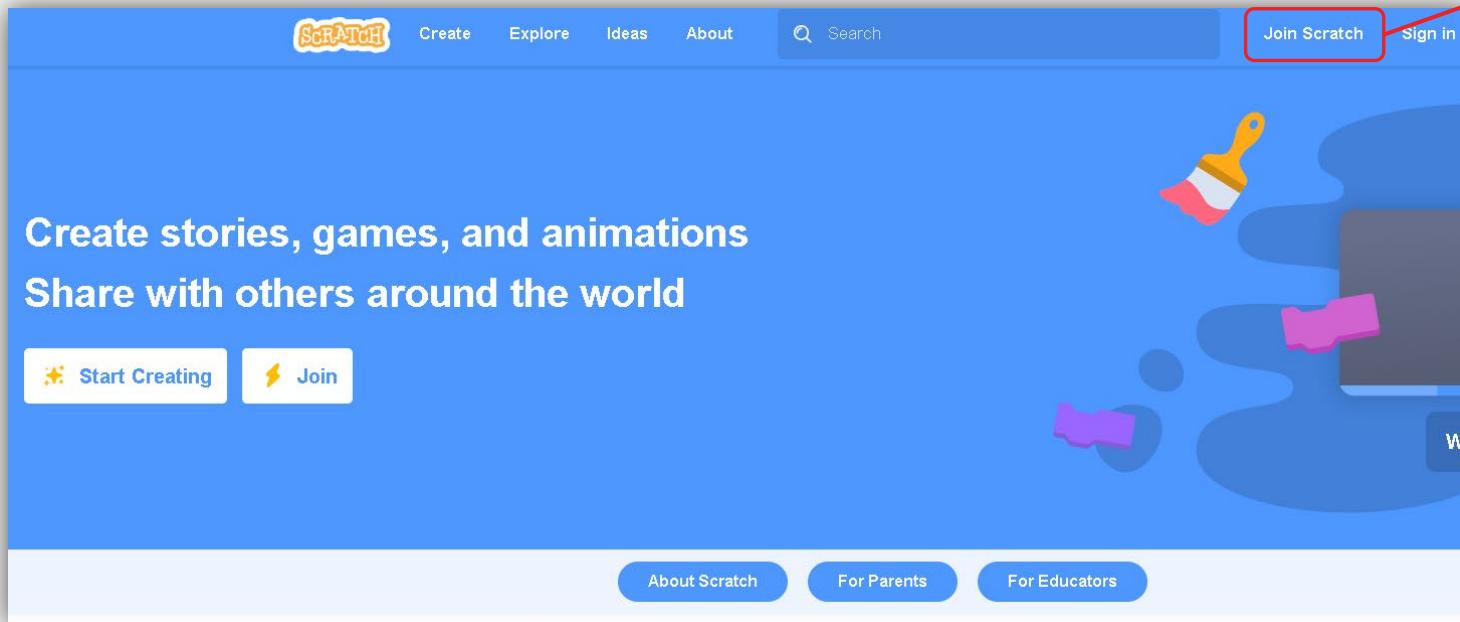
How to get yourself started?

The screenshot shows the Scratch website homepage. At the top, there's a navigation bar with links for 'Create', 'Explore', 'Ideas', 'About', 'Search', 'Join Scratch', and 'Sign in'. Below the navigation, a large central image features a hand pointing at a video player with a play button, surrounded by various icons like a paintbrush, a keyboard, and a drum. Text on the left side reads 'Create stories, games, and animations' and 'Share with others around the world'. Below this are two buttons: 'Start Creating' and 'Join'. At the bottom of the main section, there are three buttons for 'About Scratch', 'For Parents', and 'For Educators'. A 'Watch Video' button is also present. Below this, a 'Featured Projects' section displays five thumbnail images with titles: 'Gnisril's Magic Pickaxe', 'Owl Marker Sketch', 'ゼリーパズル/Jelly PU', 'Beethoven (platform)', and 'IMMORTALS AMV - Wol'. The URL <https://scratch.mit.edu/> is prominently displayed below the featured projects.

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?

Join Scratch

Create projects, share ideas, make friends. It's free!

Create a username

Don't use your real name

Create a password

Type password again

Show password

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?



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?

What's your email?

Email address

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

Required

I'd like to receive emails from the Scratch Team about project ideas, events, and more.

By creating an account, you acknowledge the [Privacy Policy](#) and you accept and agree to the [Terms of Use](#).

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

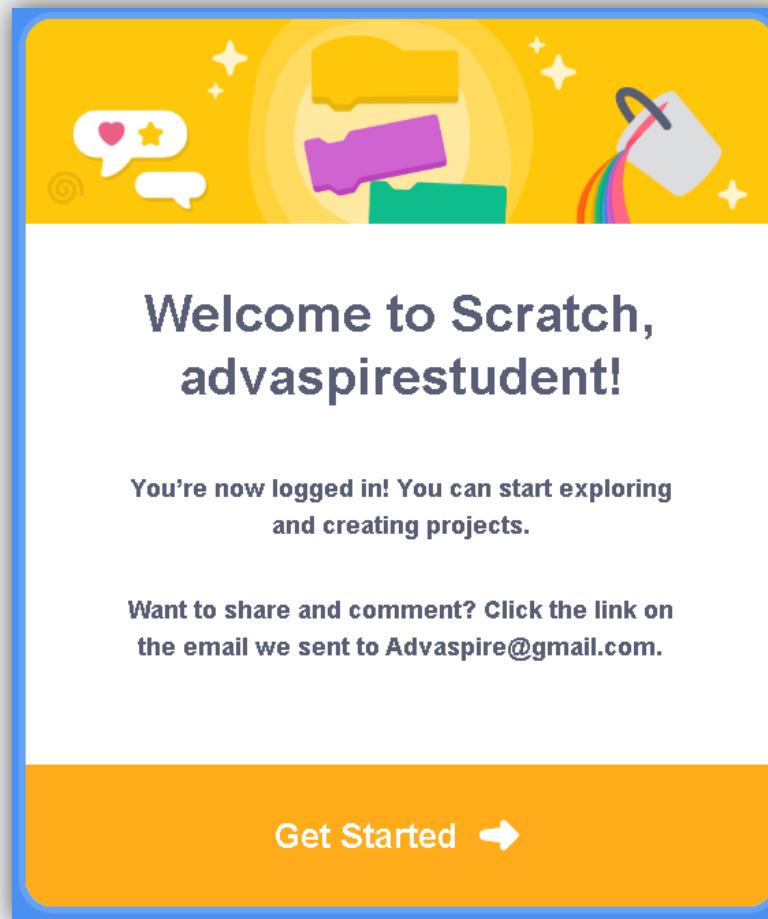
If you do not have email address, please request help from your parents.

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

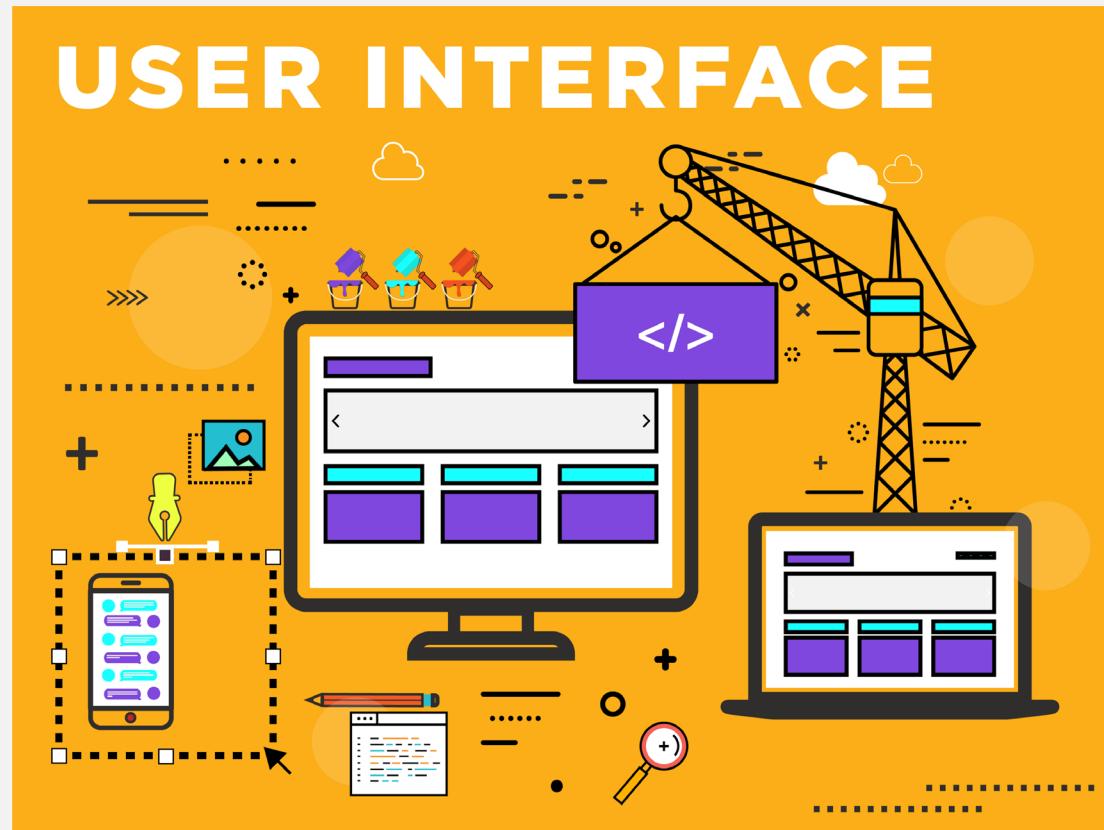
The screenshot shows the Scratch website interface. At the top, there's a blue header with the Scratch logo, a 'Create' button (which is highlighted with a red box and a white letter 'a'), 'Explore', 'Ideas', and 'About' links, a search bar, and a user account dropdown. Below the header is a yellow banner with the text 'Confirm your email to enable sharing. Having trouble?'. The main content area has three main sections: 'Learn how to make a project in Scratch' (with a thumbnail of a script), 'Try out starter projects' (with a thumbnail of a sea creature project), and 'Connect with other Scratchers' (with a grid of user icons). To the right, there are three promotional cards: 'Scratch Video Update!', 'New Scratch Design Studio!', and 'How to: Pixel Art in Scratch'.

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Logged back to your account.

Click “Create” to start your new project.



Scratch User Interface





Scratch Programming Environment

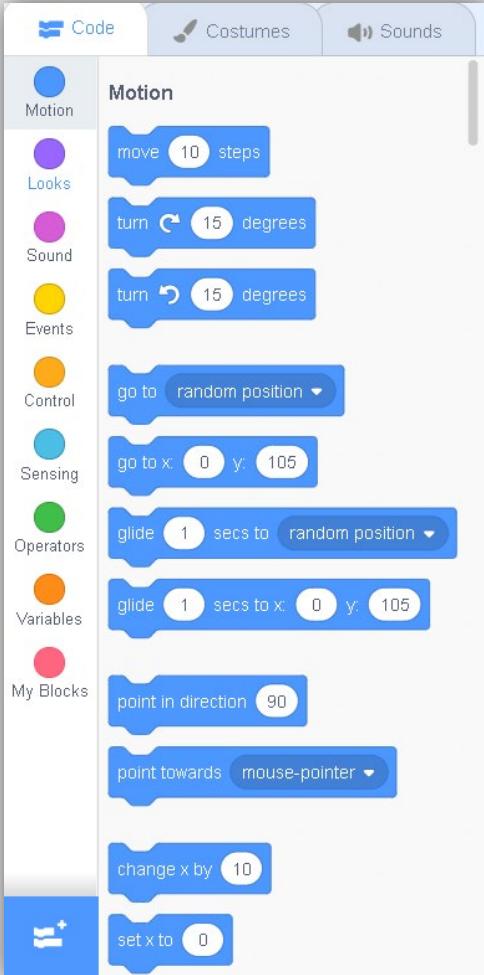
The image shows the Scratch programming environment. On the left, the script editor displays a list of blocks categorized by color: Motion (blue), Looks (purple), Sound (pink), Events (yellow), Control (orange), Sensing (teal), Operators (green), Variables (orange), and My Blocks (red). In the center, the stage features a cat sprite running towards the right. On the right, the sprite editor shows details for "Sprite1": Show (selected), Size (100), Direction (90), and a thumbnail of the cat sprite. The bottom of the screen shows the word "Backpack". A callout bubble with a red border and white background contains the text "This is how the Scratch programming environment looks like." and a small red letter "a" in a circle.

This is how the Scratch programming environment looks like.

a



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

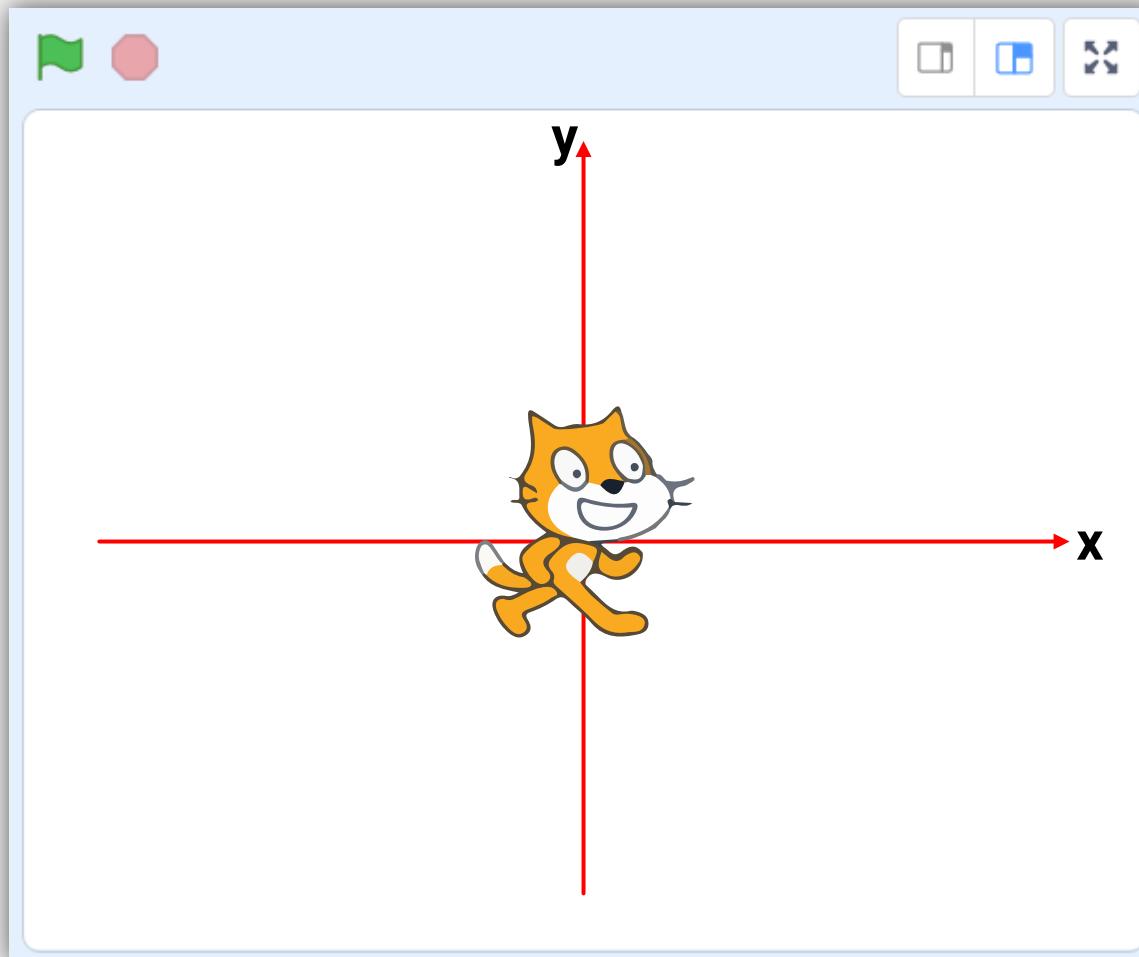
Operators – For mathematical Calculation

Variables – For variable settings

My Blocks – Customize your own blocks



Scratch Programming Blocks - Move



Coordination: (x, y)

Centre = $(0, 0)$

Coordination basically refers to the position of the Sprite.

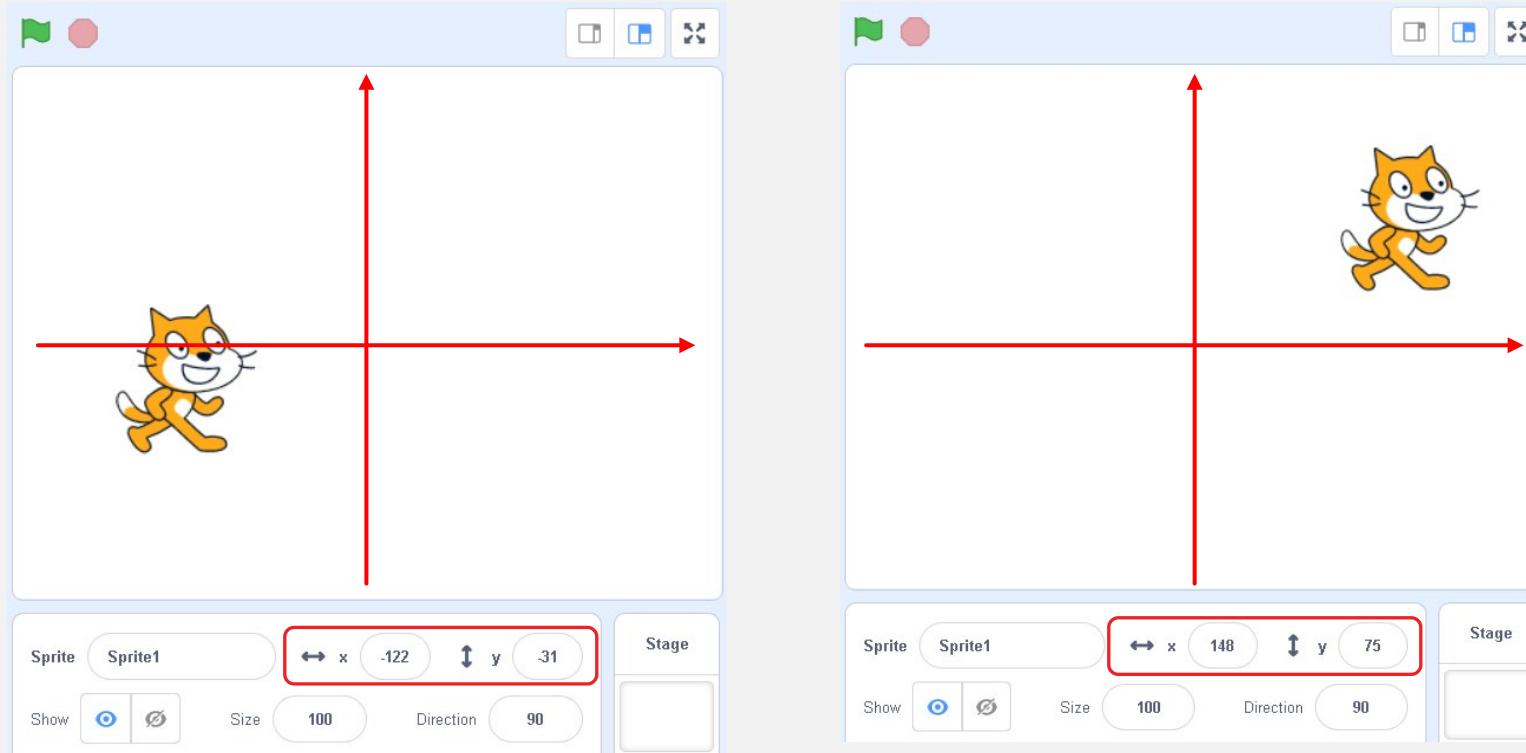
x coordinate >> left and right
y coordinate >> up and down

Change in coordination:

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



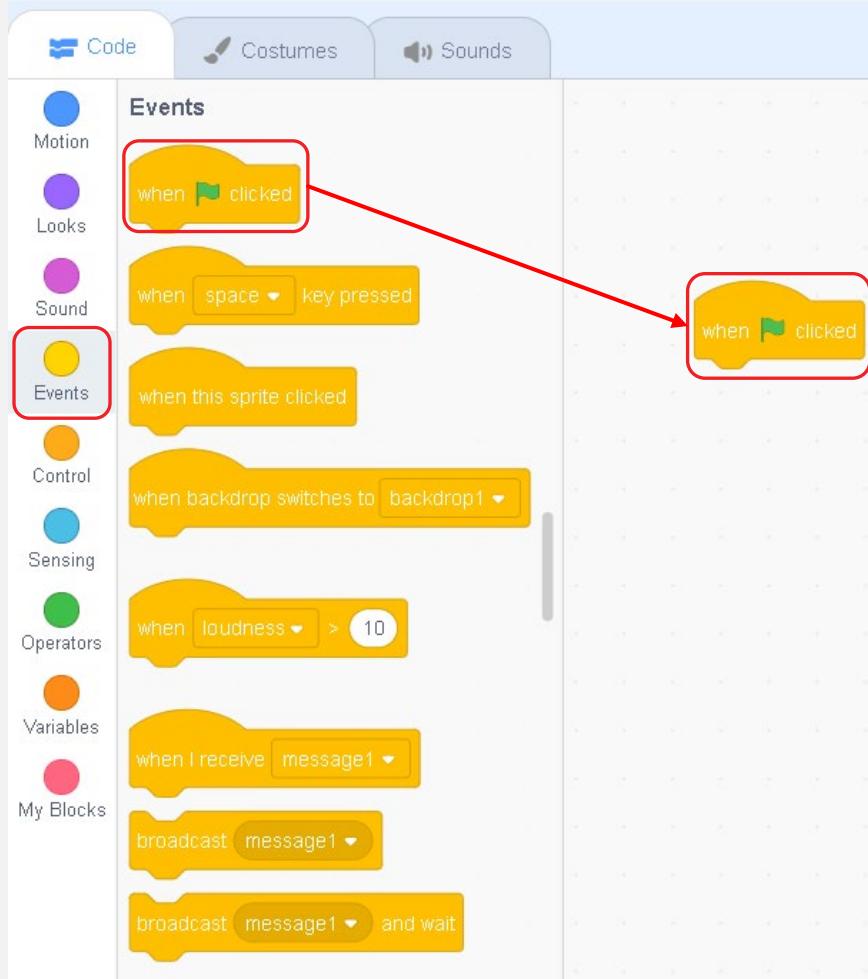
Scratch Programming Blocks - Move



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



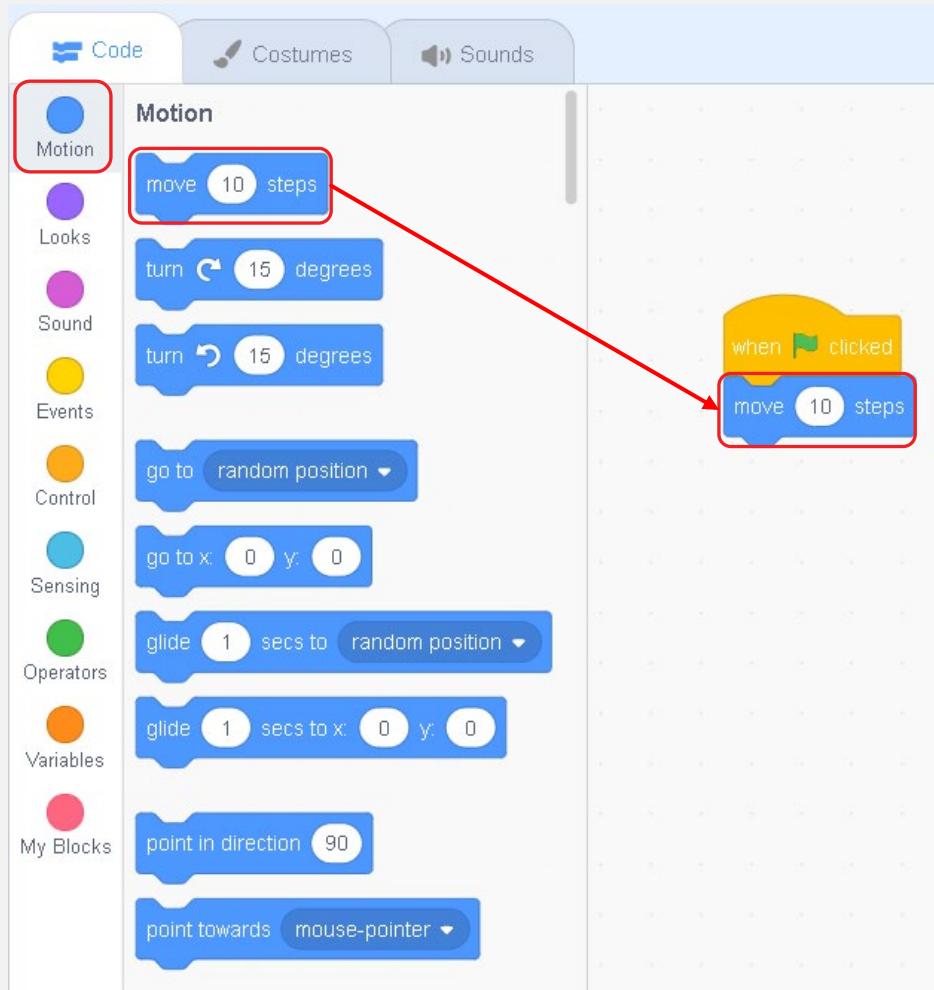
Scratch Programming Blocks - Move



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:

The Scratch script editor window shows a script for a cat sprite. The script consists of two blocks: a yellow "when green flag clicked" hat block and a blue "move (10) steps" control block.

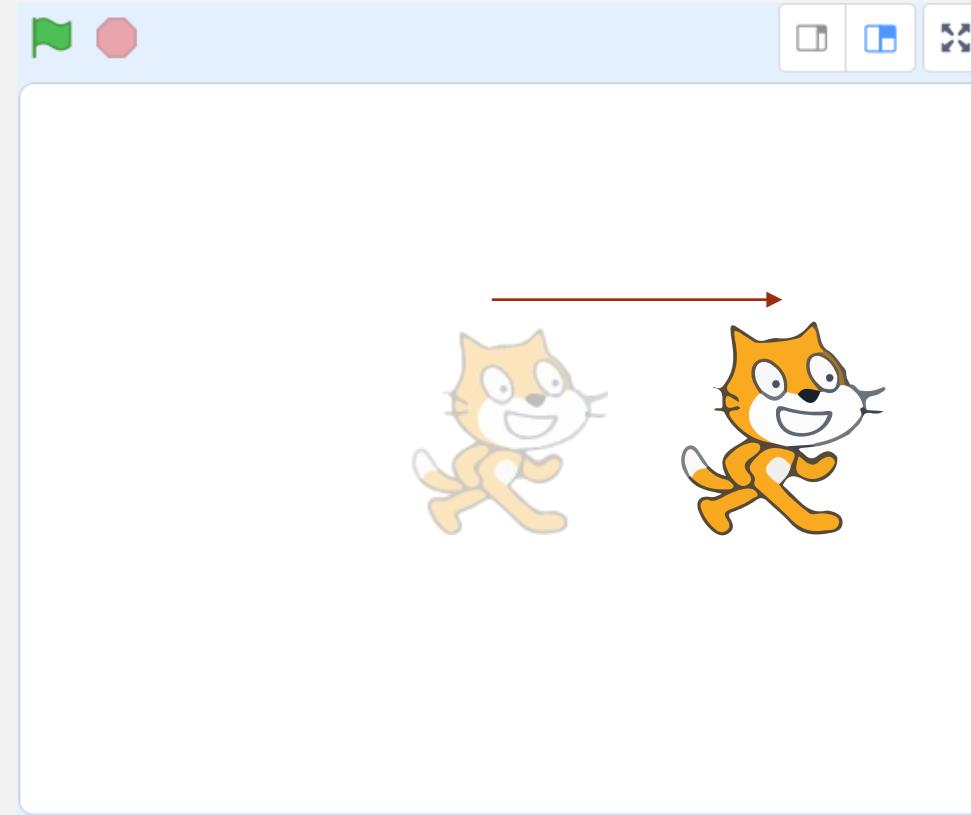
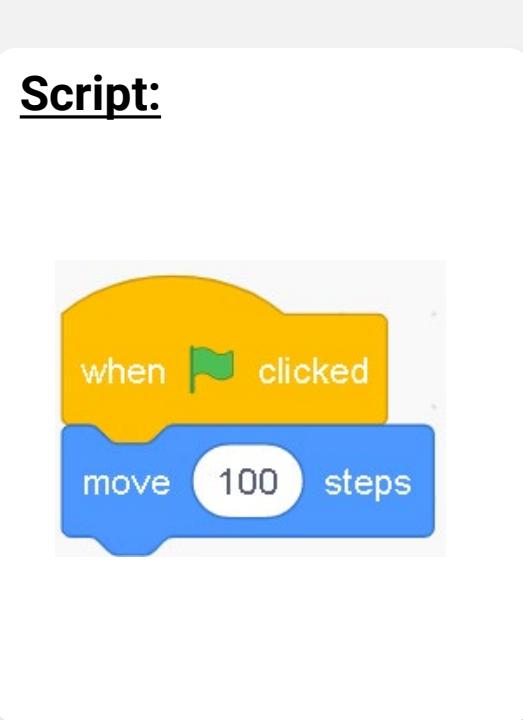
When the green flag is clicked, the cat sprite moves forward 10 steps in the direction it is facing.

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

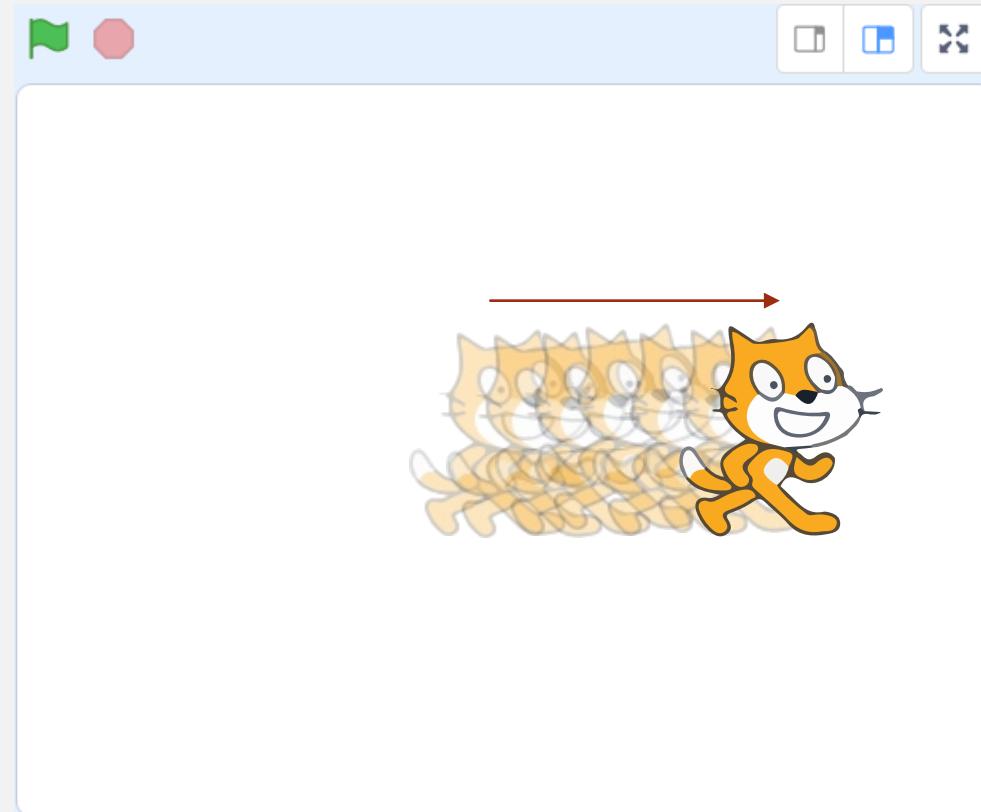
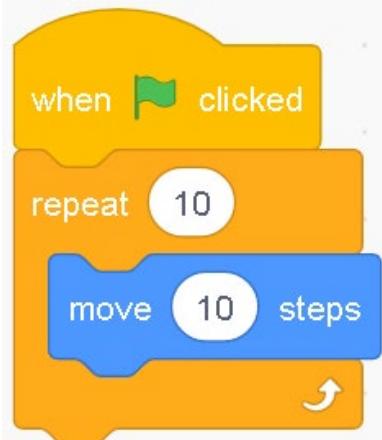


If you change “10” to “100”,
Your sprite (Cat) will straight
jump forward for 100 steps.



Animation Moves

Script:



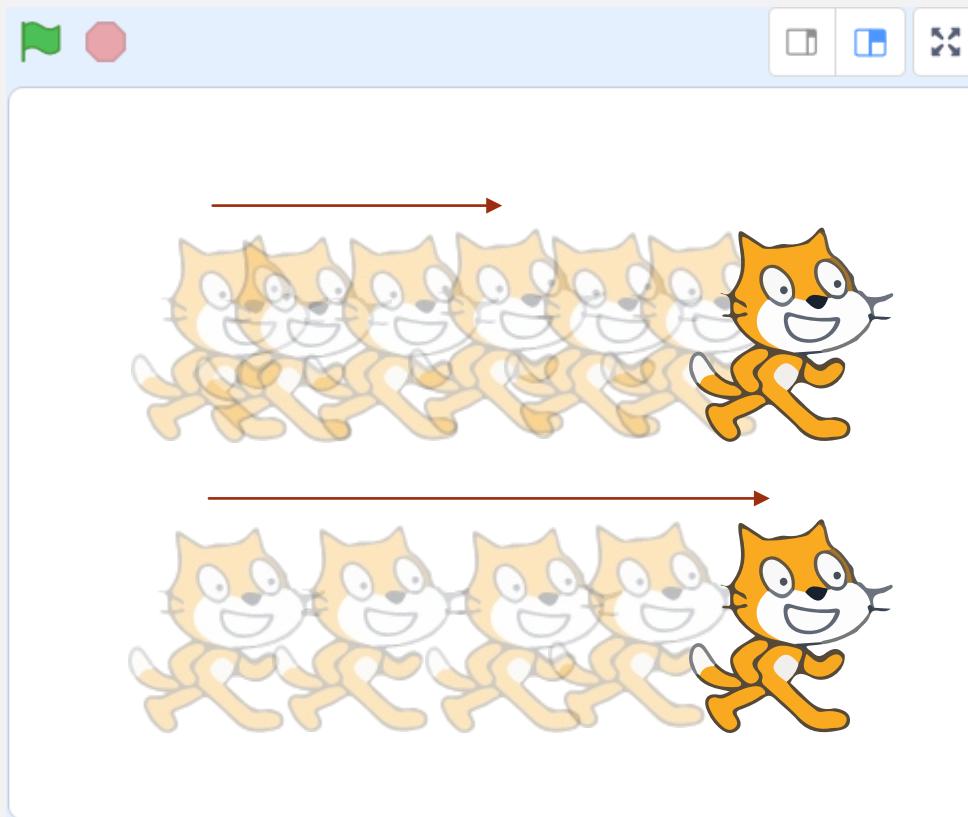
To make animation move, you need to make the steps repeat for few time.

>> 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:

```
when green flag clicked
repeat (20)
  move (10) steps
end
```

```
when green flag clicked
repeat (10)
  move (20) steps
end
```

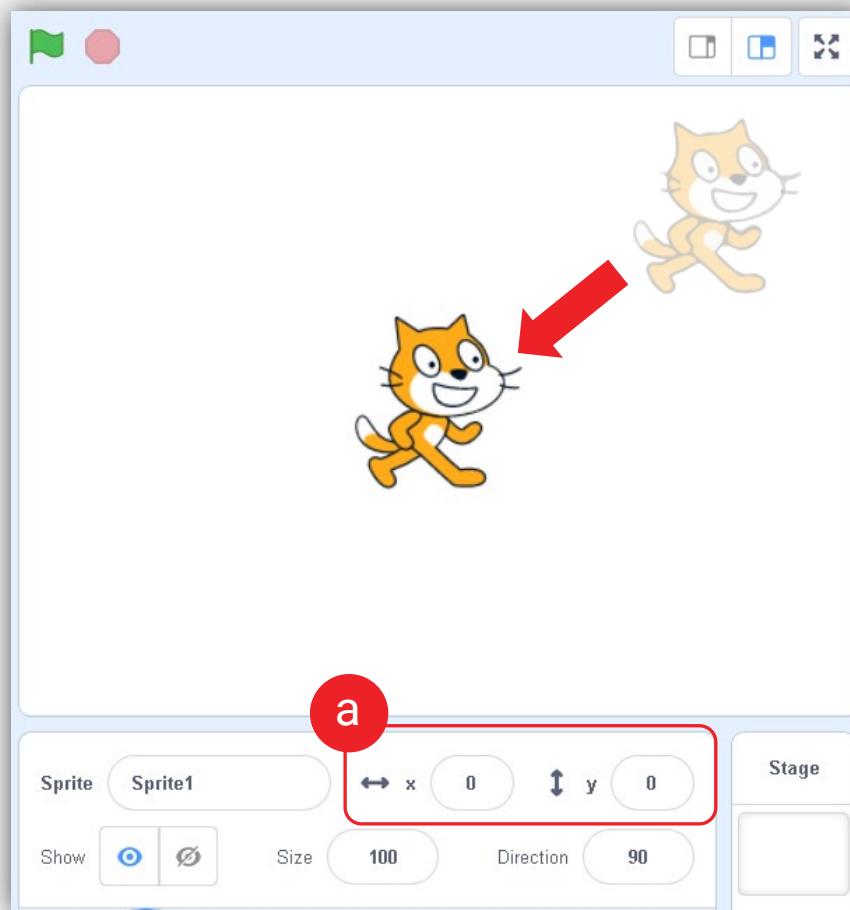
If you put higher value in repeat block (without changing the move steps), the cat should move further.

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:

The Scratch script consists of the following blocks:

- when green flag clicked
- go to x: 0 y: 0
- repeat (10)
 - move (10) steps

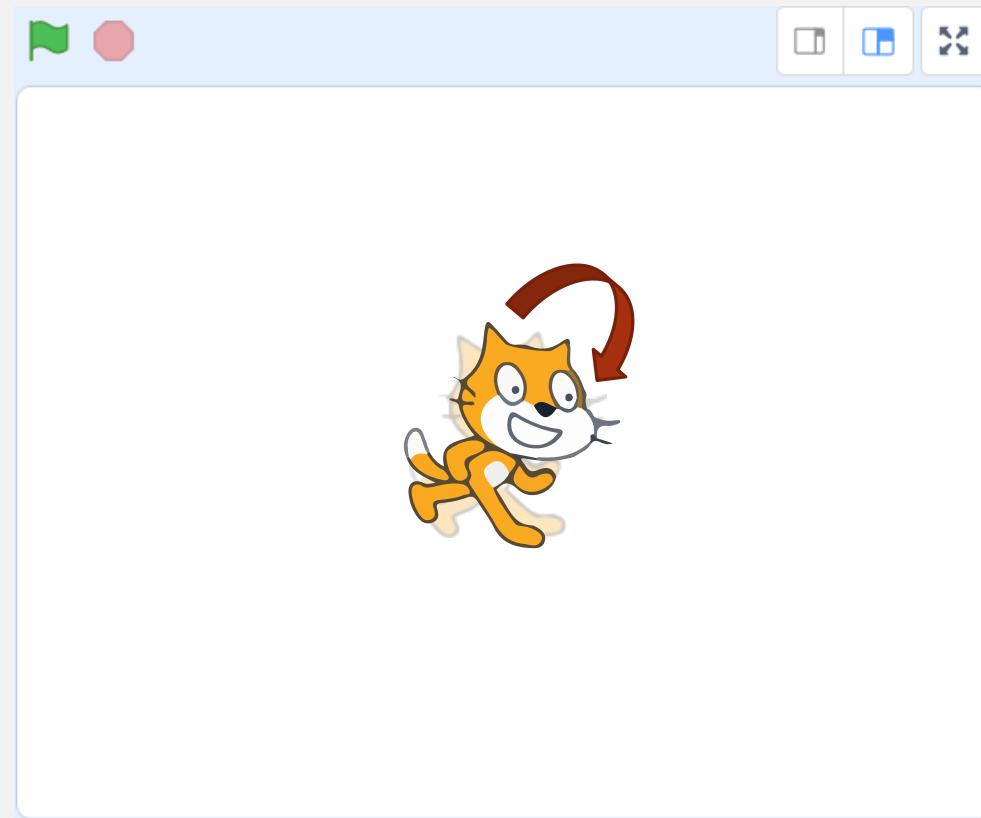
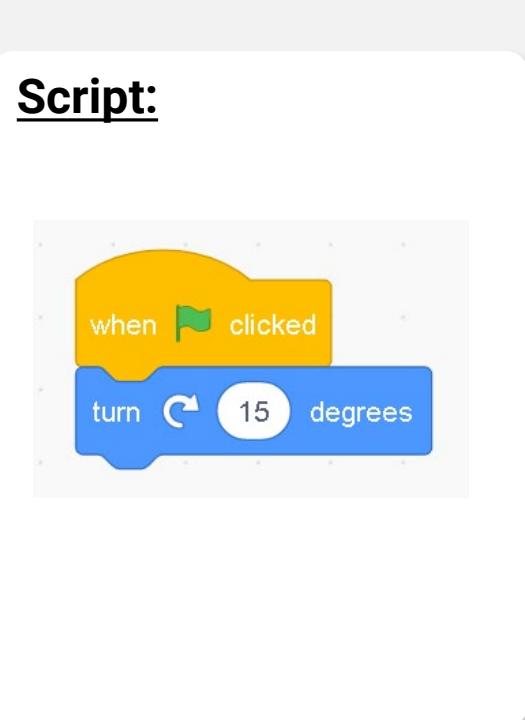
The stage shows a cat sprite running towards the right. A red arrow points to the right above the cat.

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



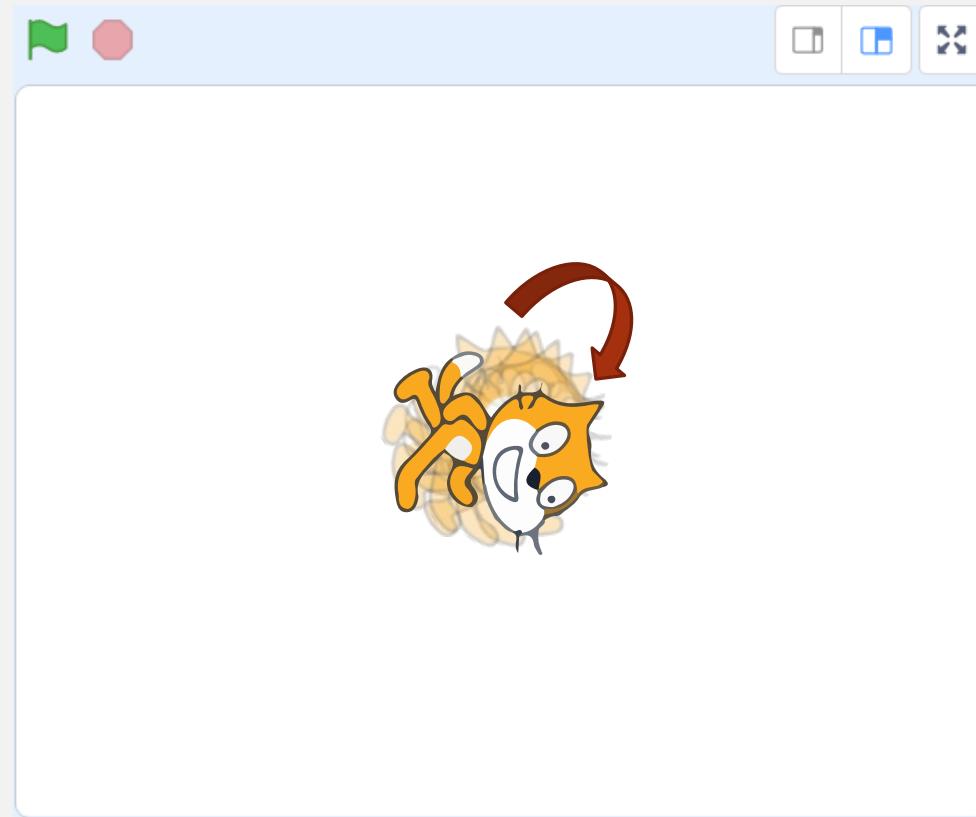
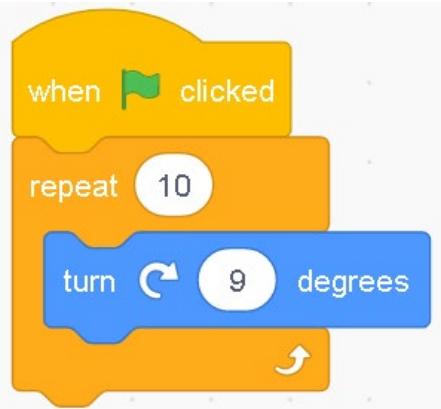
From start, your object will face 90°.

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



Turning Direction

Script:



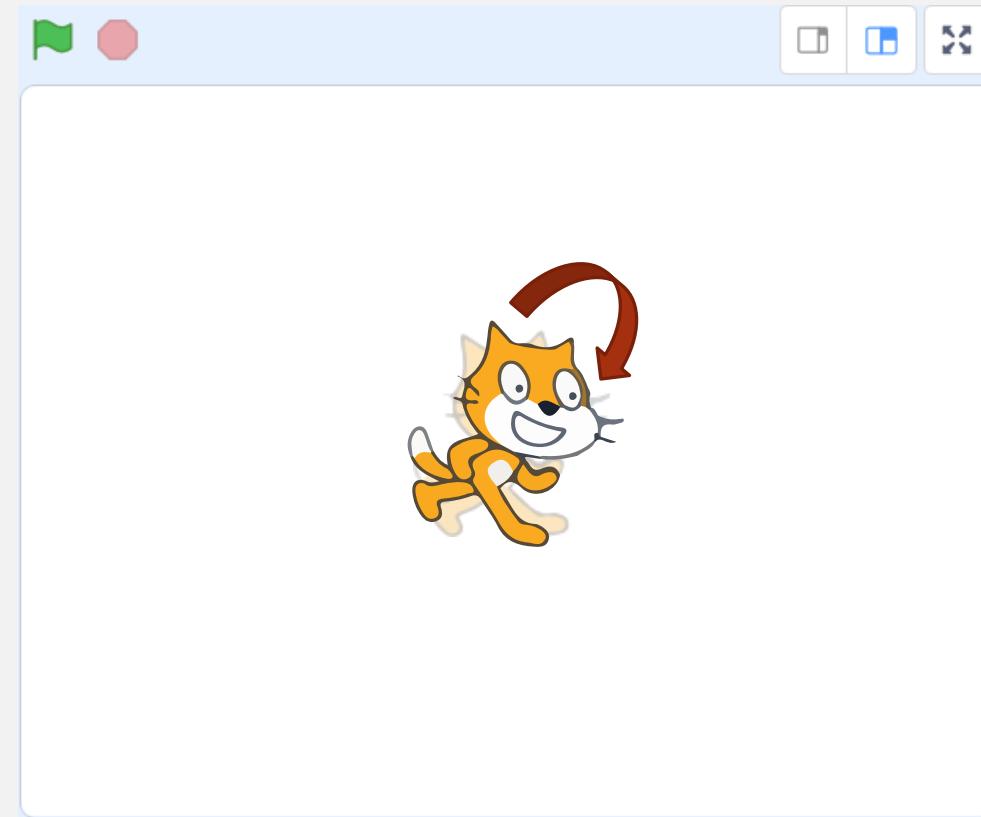
If you want to make like a motion when doing 90° turn, you can add the repeat block and repeat 10° for 9 times.



Set Starting Direction

Script:

```
when green flag clicked
  point in direction 90
  repeat (10)
    turn (9) degrees
  end
```



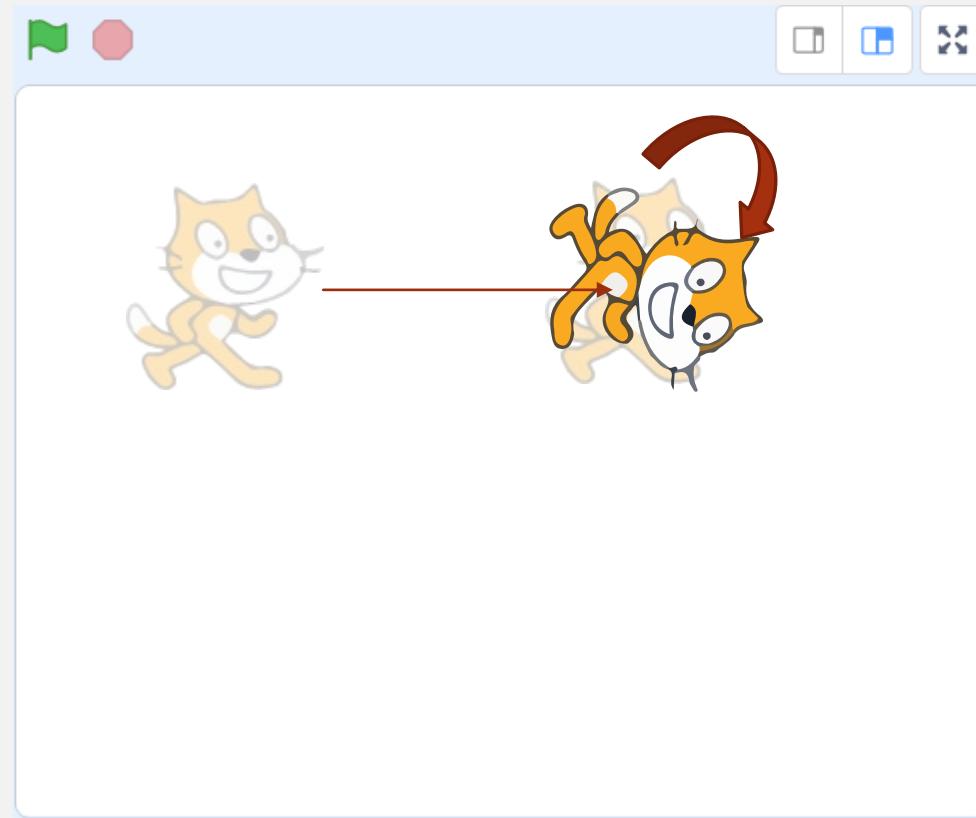
To set your starting direction, you can place a “[point in direction](#)” block before you start the turning motion.



Combining Actions

Script:

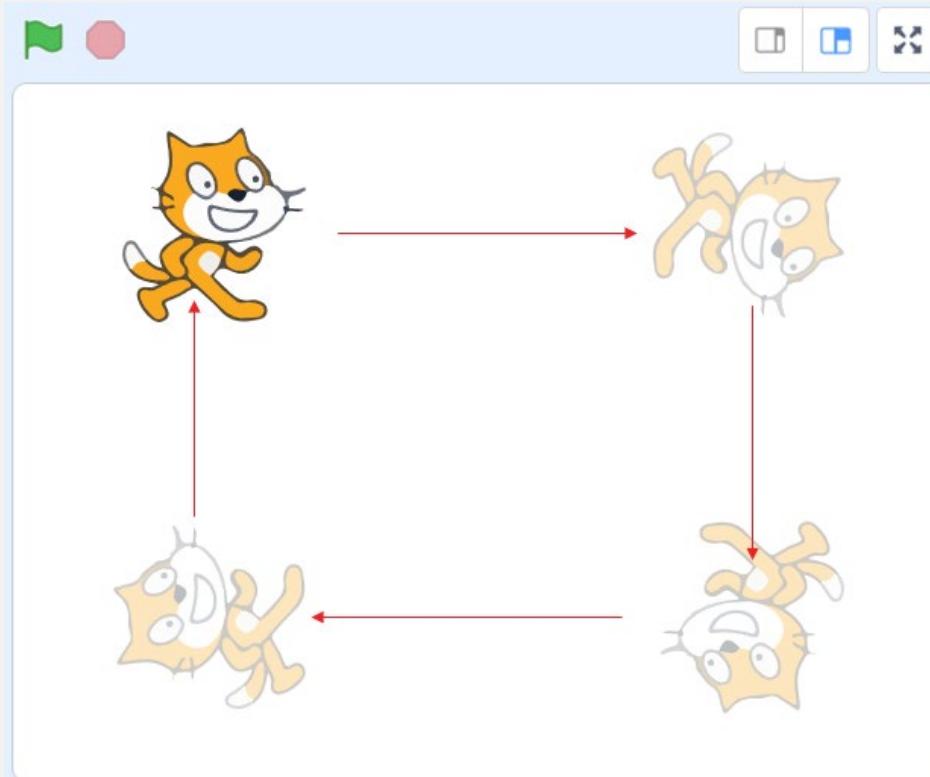
```
when green flag clicked
  go to x: -114 y: 80
  point in direction 90
  repeat (20)
    move (10) steps
    end
  repeat (10)
    turn (9) degrees
    end
```



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°



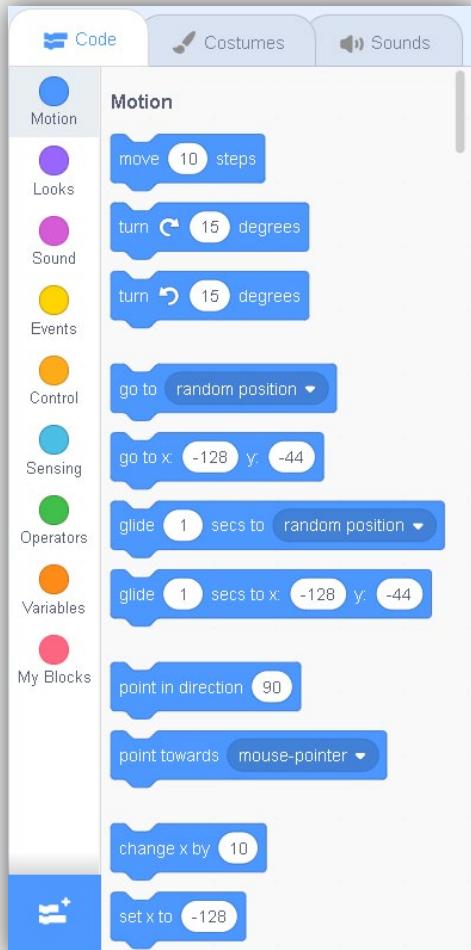
Challenge - Move in Square



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



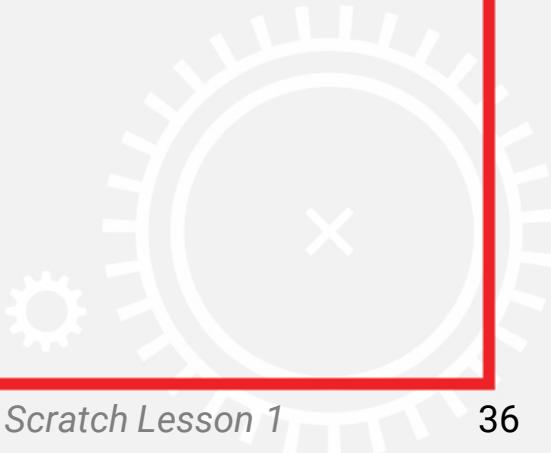
Test out other blocks

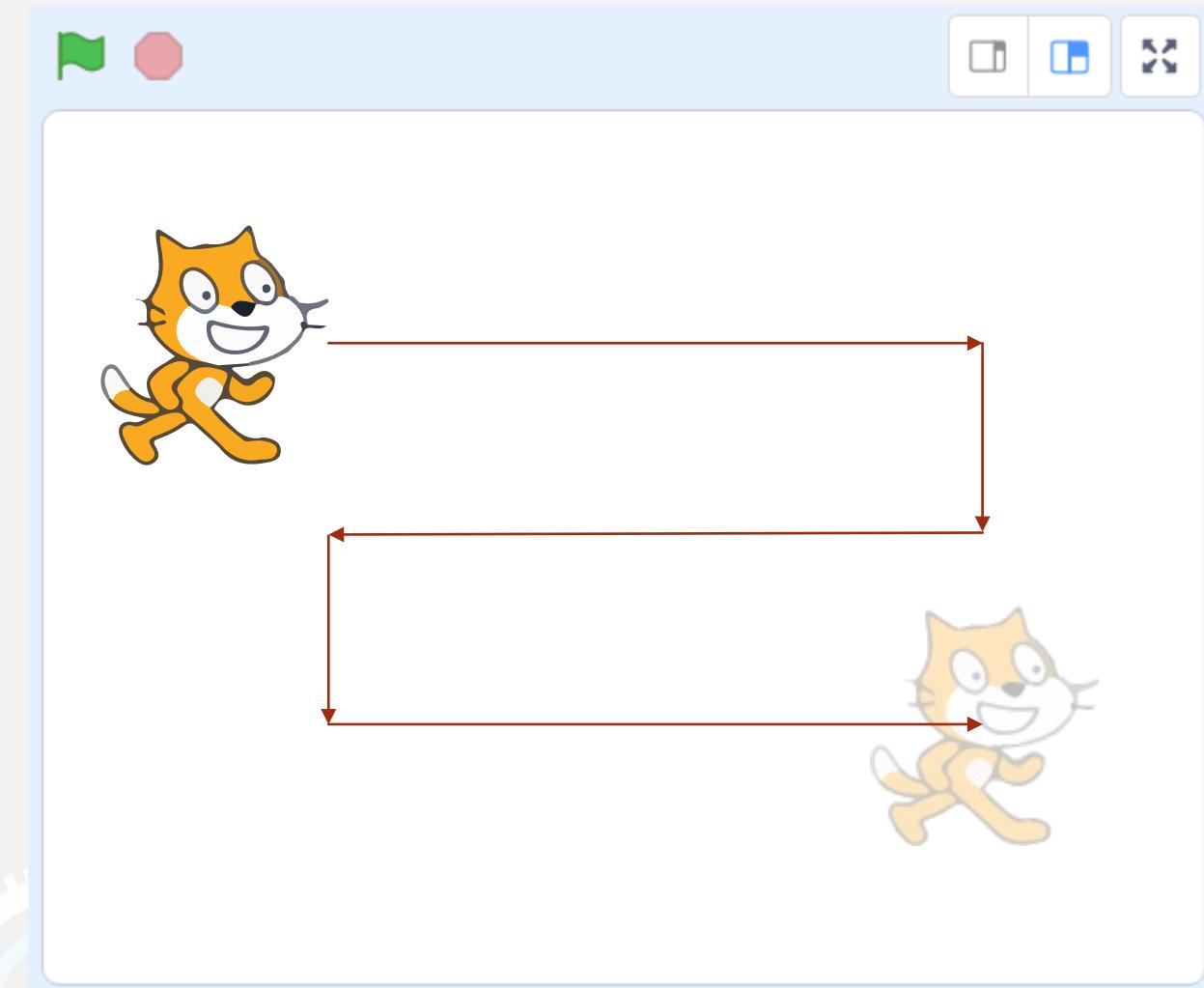


There are plenty of block types and motion for you to test out. I will cover how to change the look and make conversation in the animation.



Mission *for Lesson 1*





L1 – Mission

Can you do an “S” shape?



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 ;)