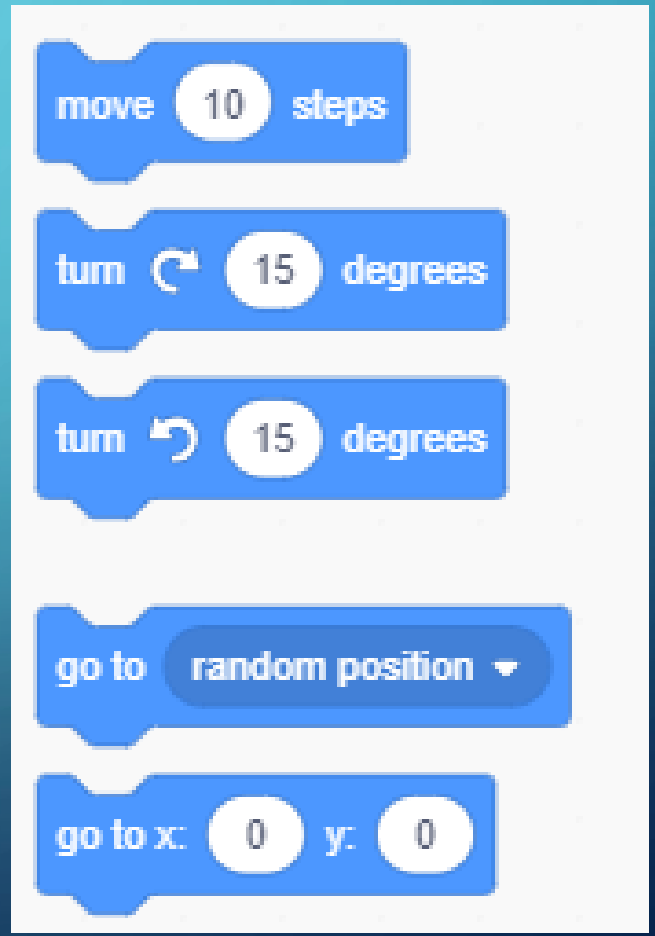
02 – MOVEMENT

M1U1P2 COMPUTER SCIENCE

WHAT CATEGORY DO WE USE FOR MOVEMENT?

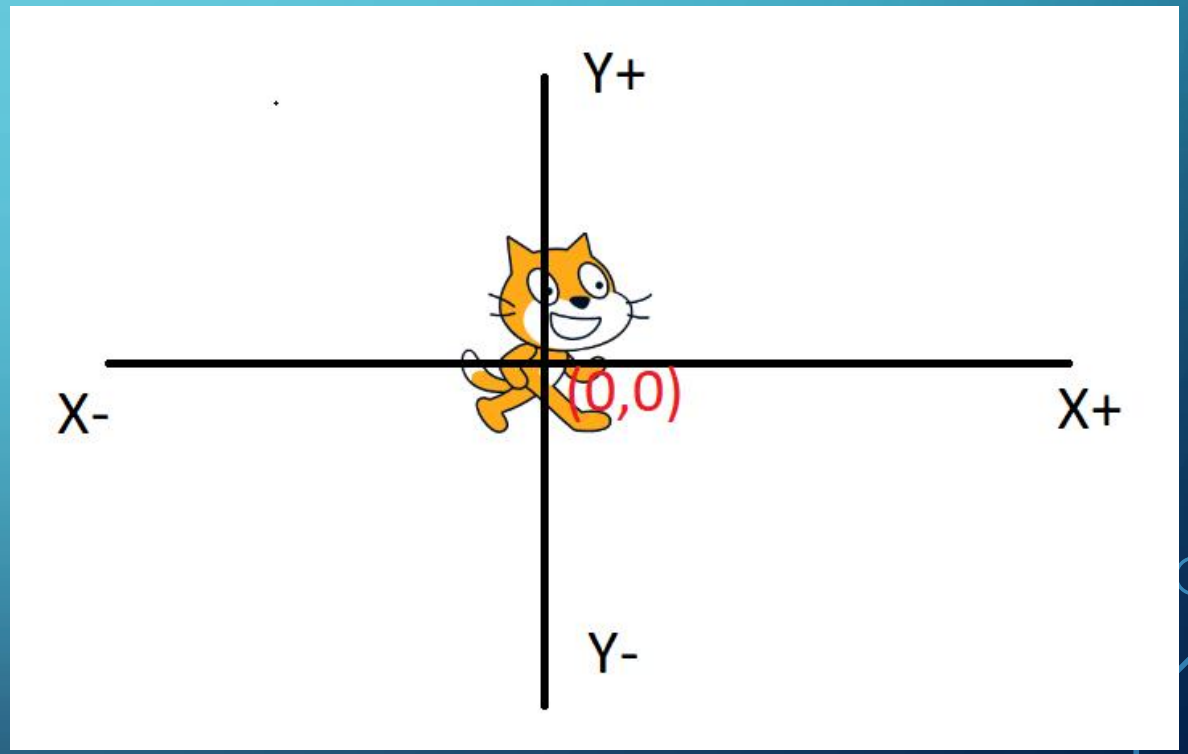
MOTION CATEGORY

- Motion category has blocks that control the movement of the Sprite or the character
- They are represented by a blue color
- There are 17 motion blocks



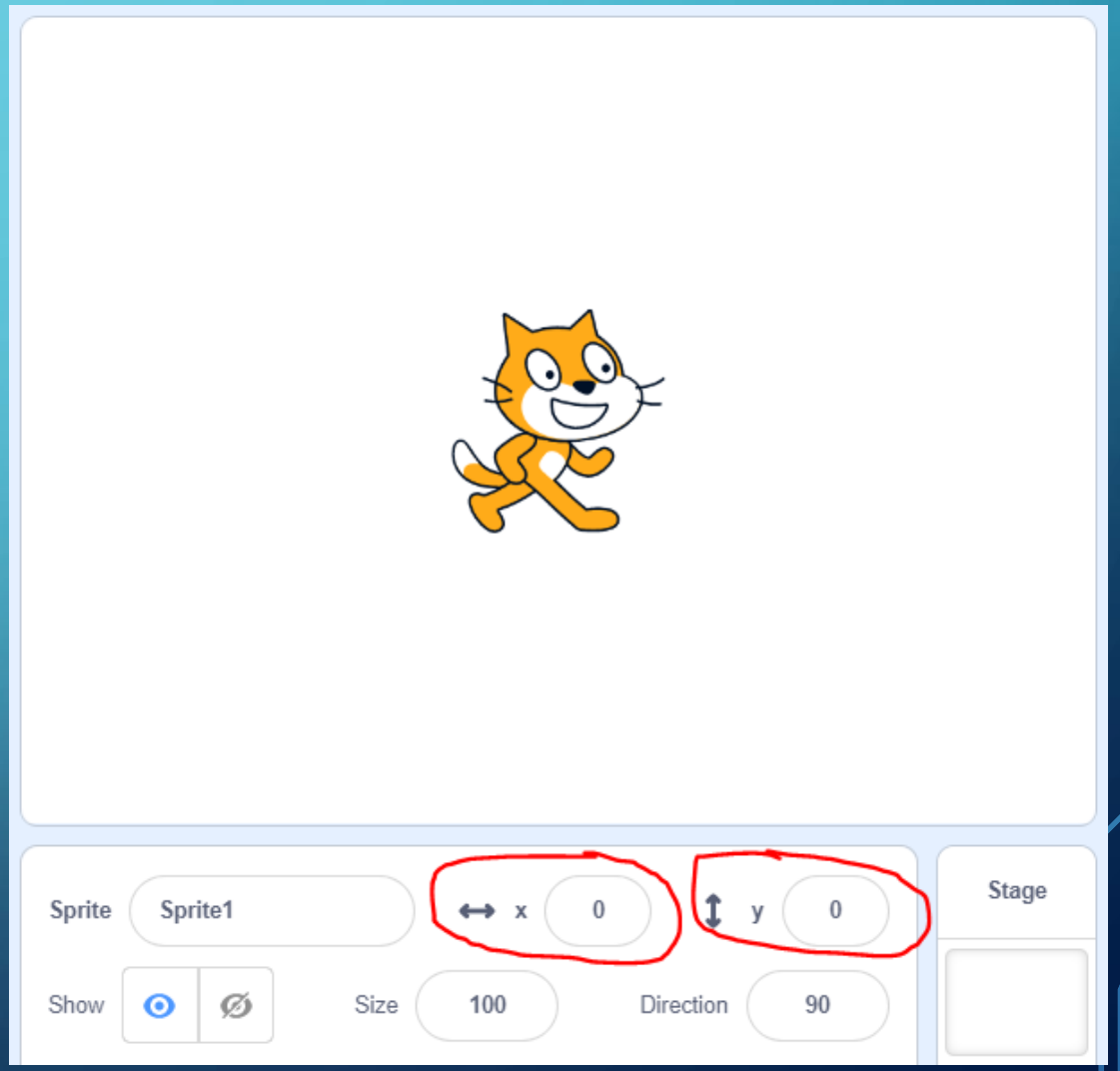
2D COORDINATIVE SYSTEM

- Scratch uses a 2D coordinative system
- 2 axis (x and y)
- X is for left and right
- Y is for up and down



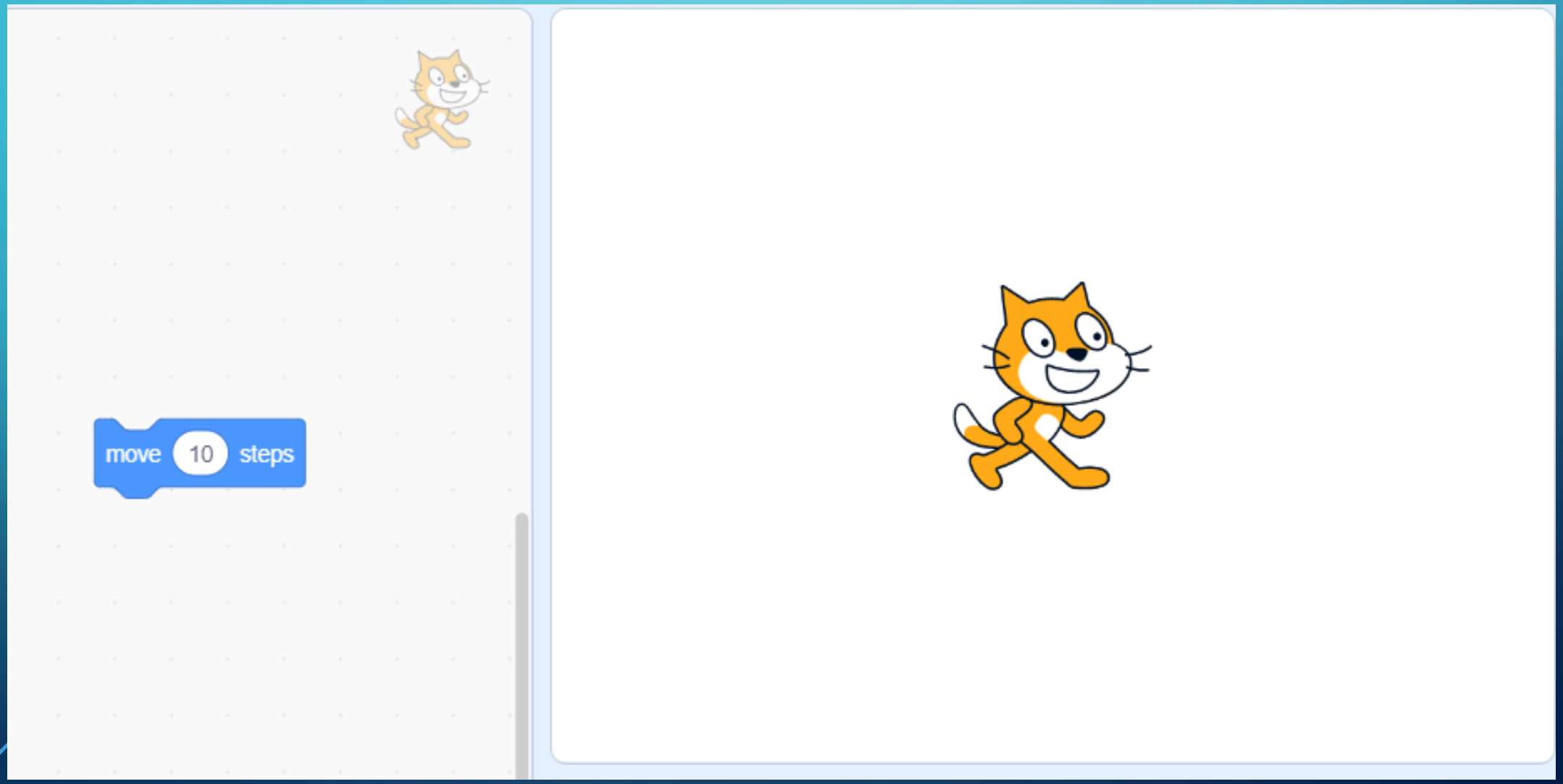
2D COORDINATIVE SYSTEM

- Scratch uses a 2D coordinative system
- 2 axis (x and y)
- X is for left and right
- Y is for up and down

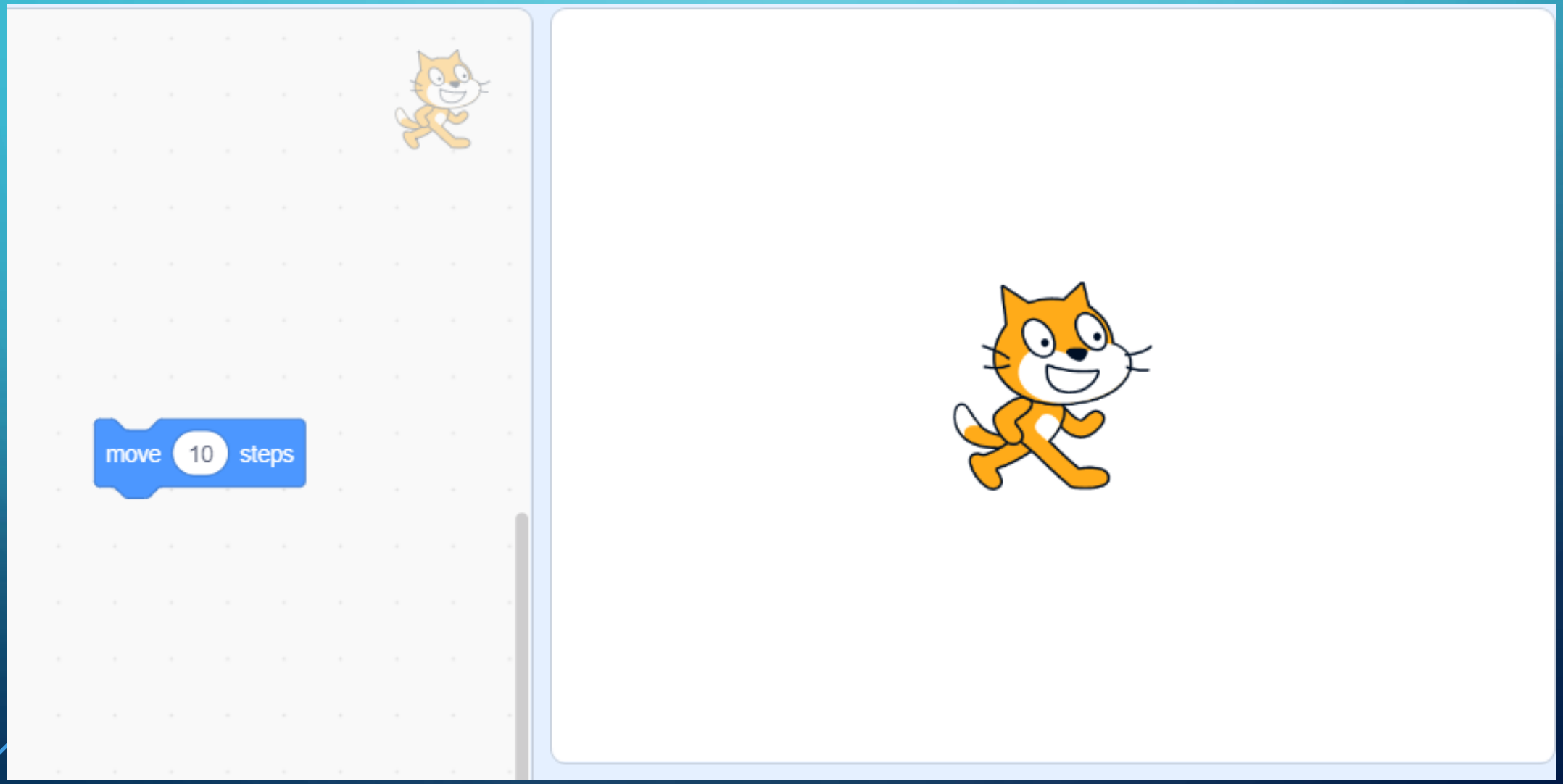


- To move the character in the direction he is looking we can use move n steps block
- Depending on if we want to move forward or backward our number of steps will be either positive or negative

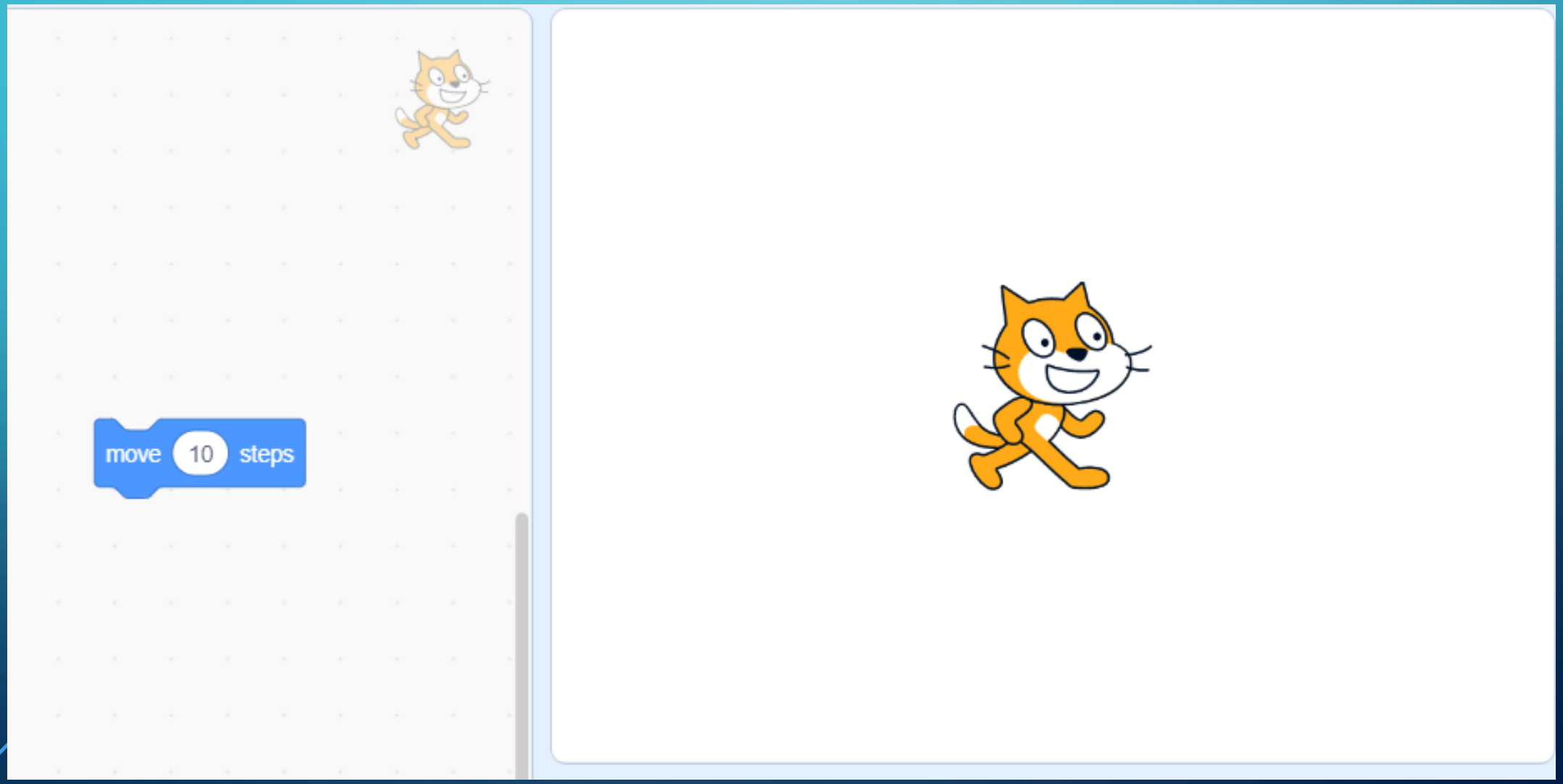
MAKE THE CAT MOVE 10 STEPS



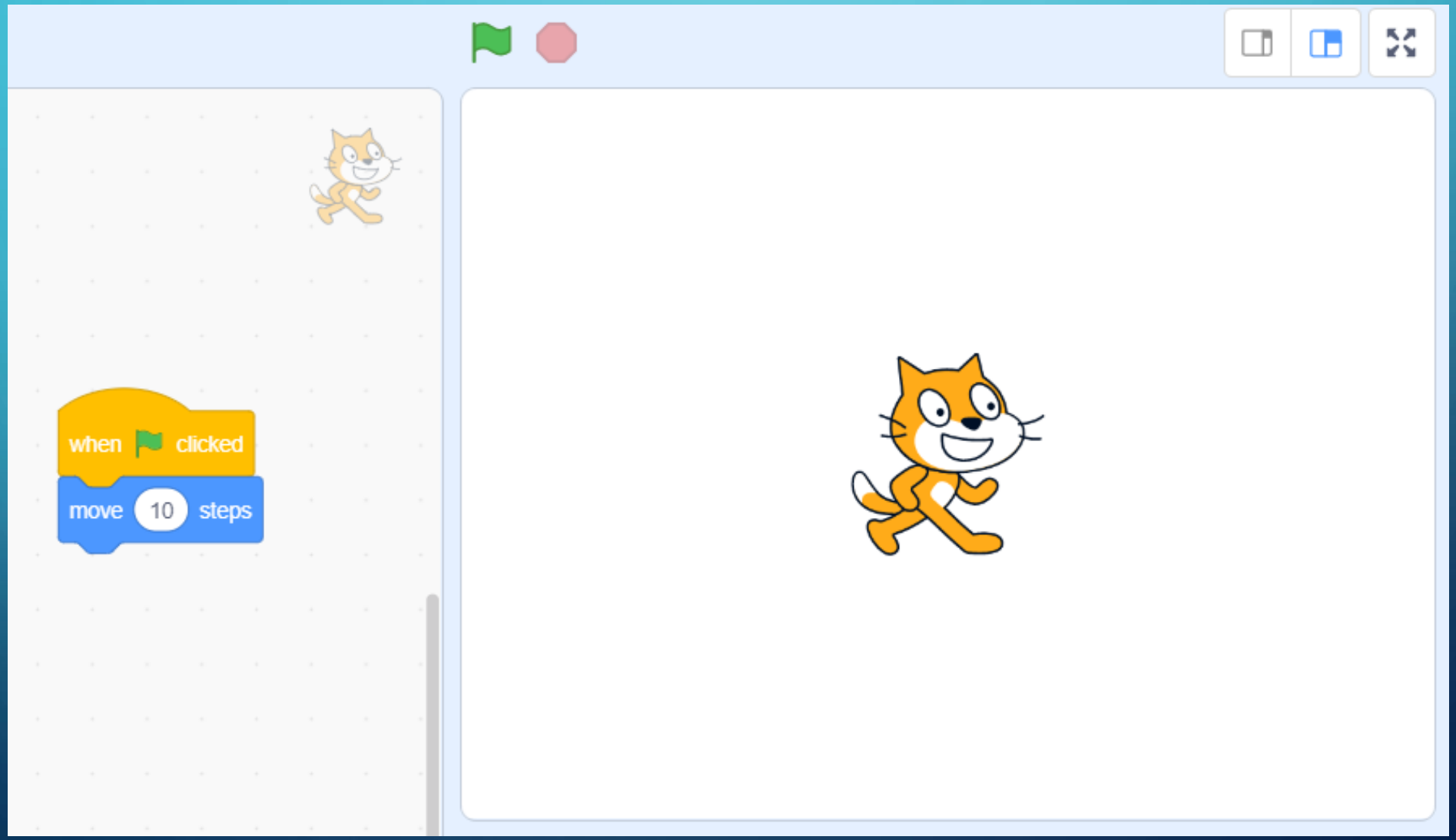
DOES THE CAT MOVE?



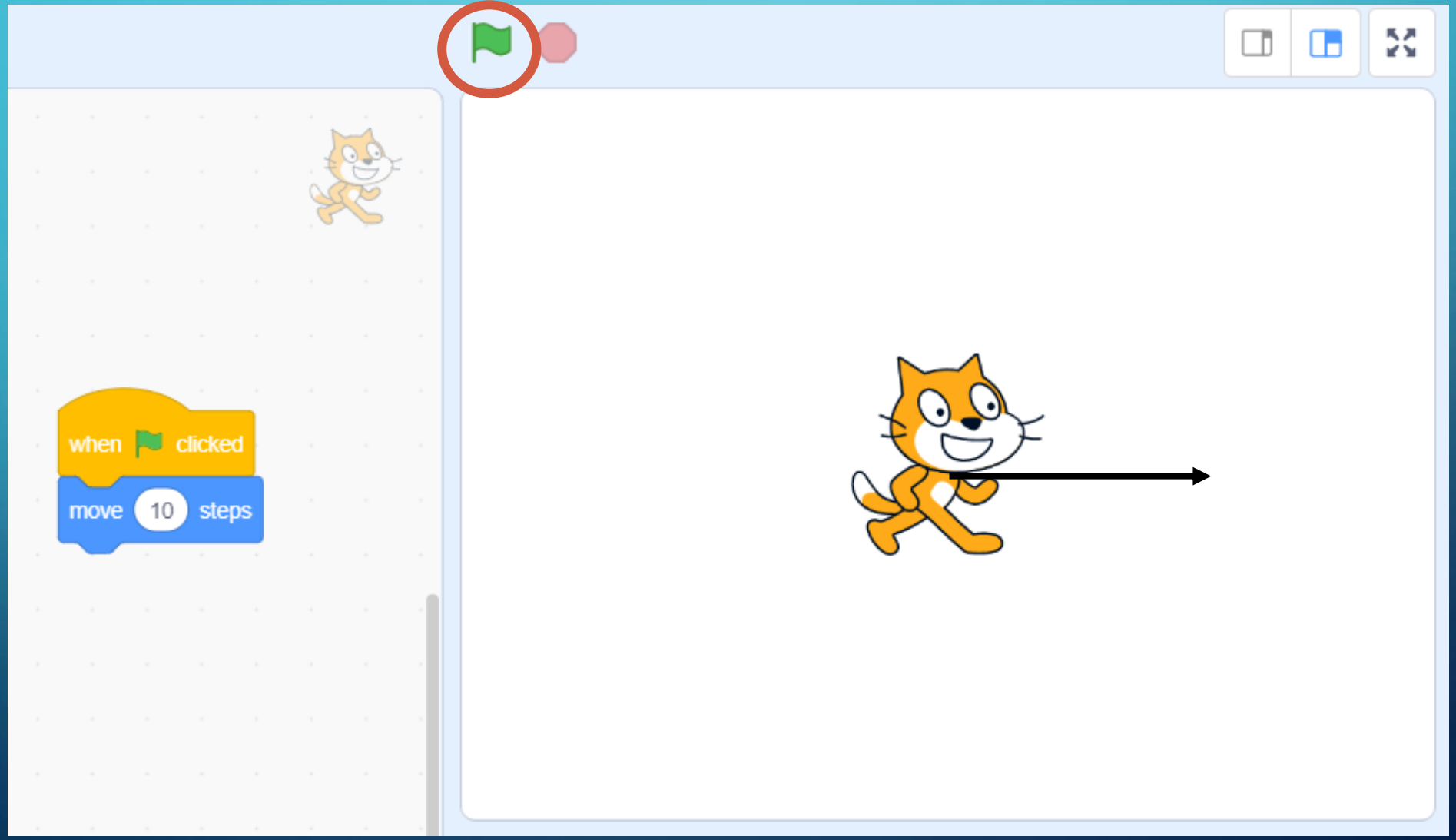
WHY NOT?



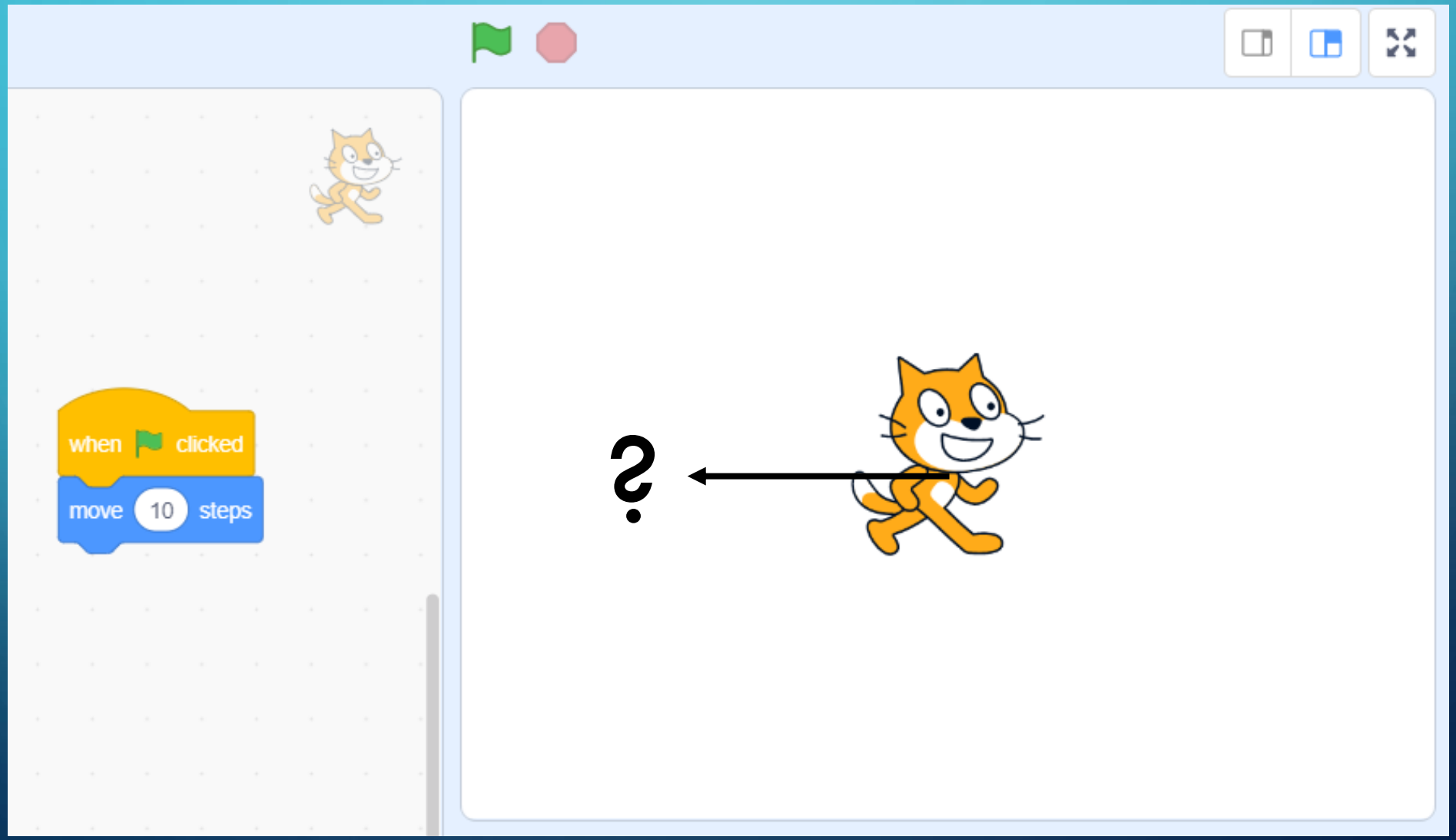
WE ARE MISSING AN EVENT BLOCK



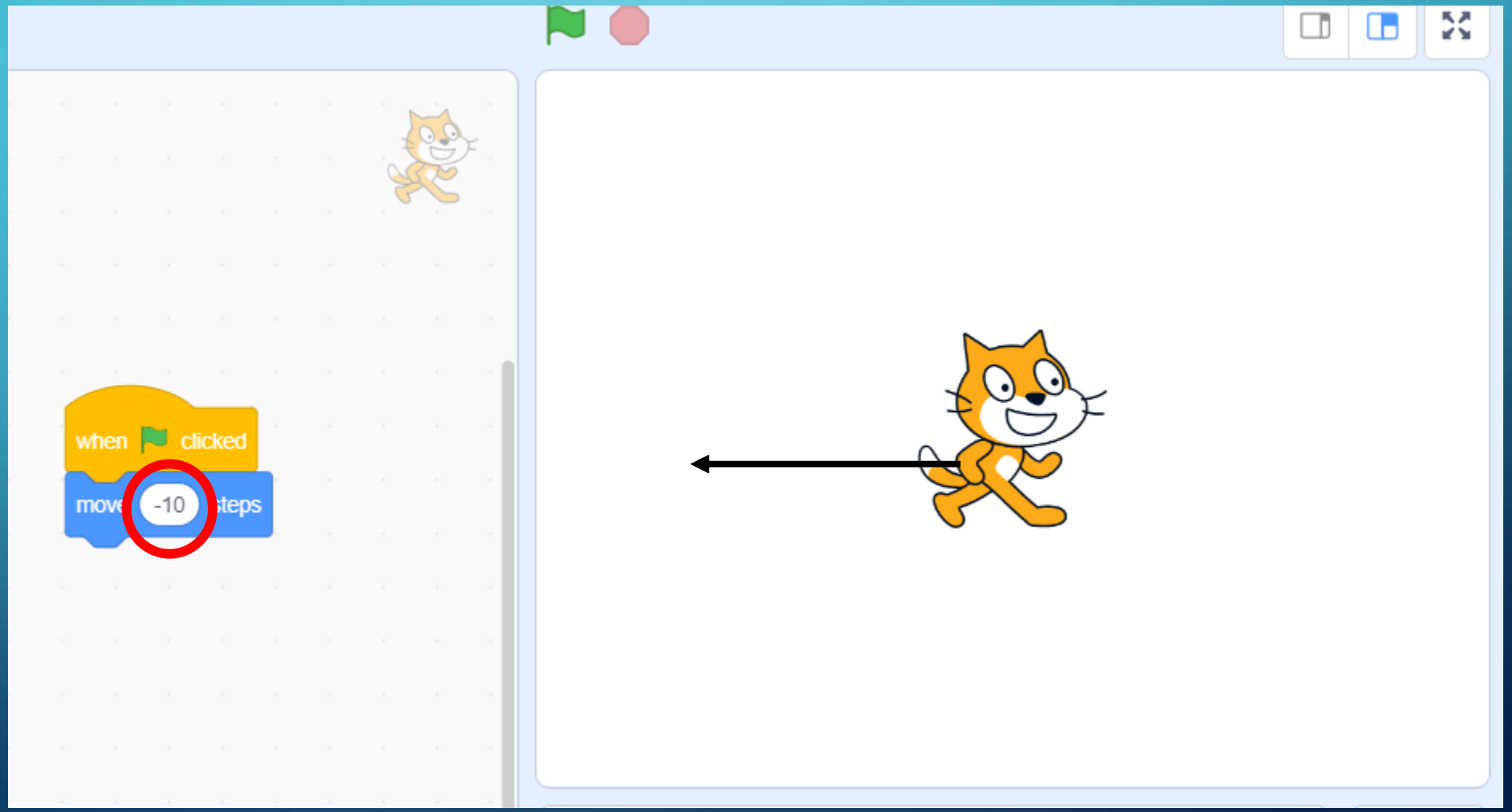
NOW WHEN WE PRESS THE GREEN FLAG THE CHARACTER MOVES



HOW CAN WE MOVE TO THE LEFT SIDE?

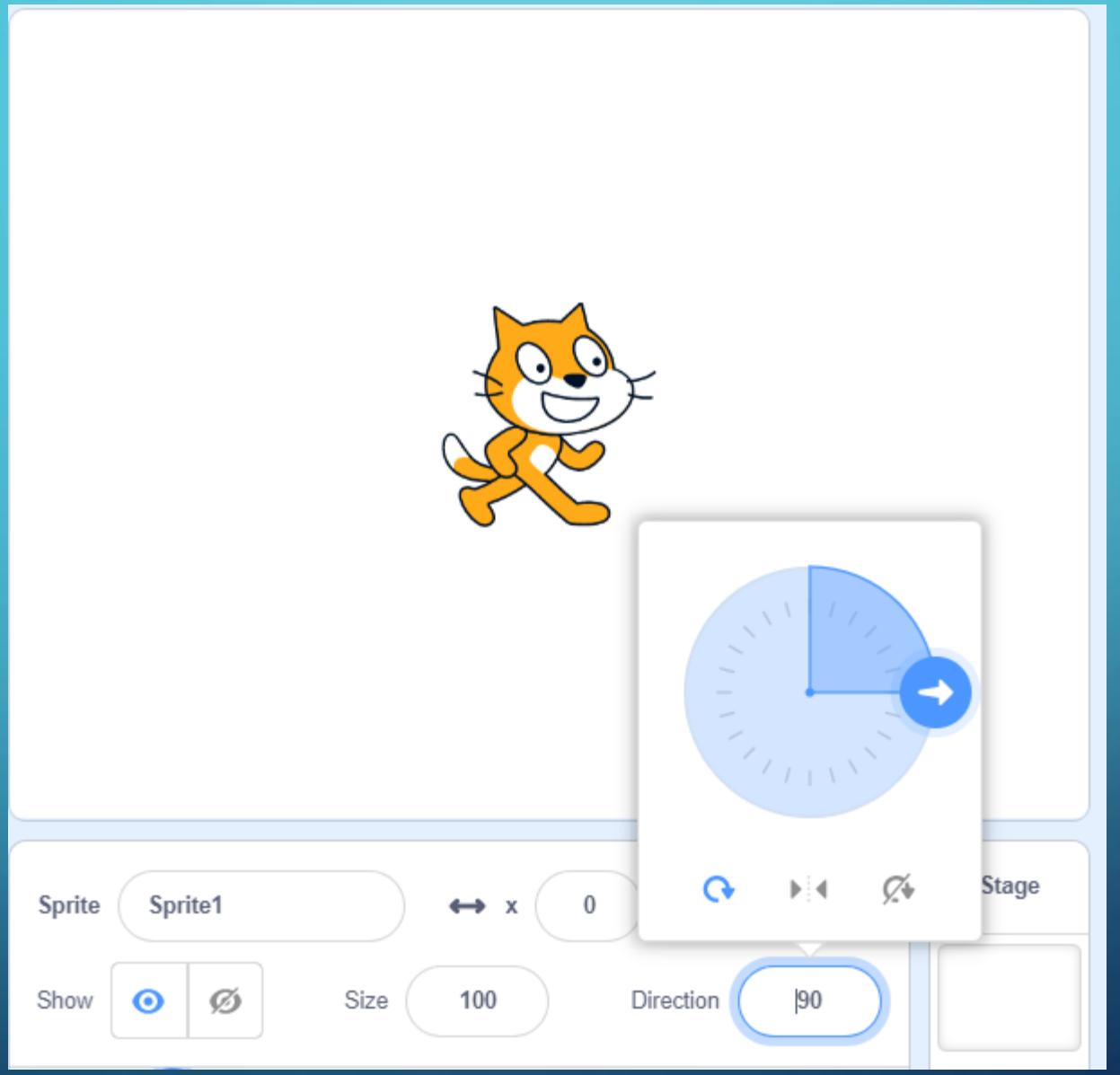


WE HAVE TO CHANGE THE STEPS TO BE NEGATIVE

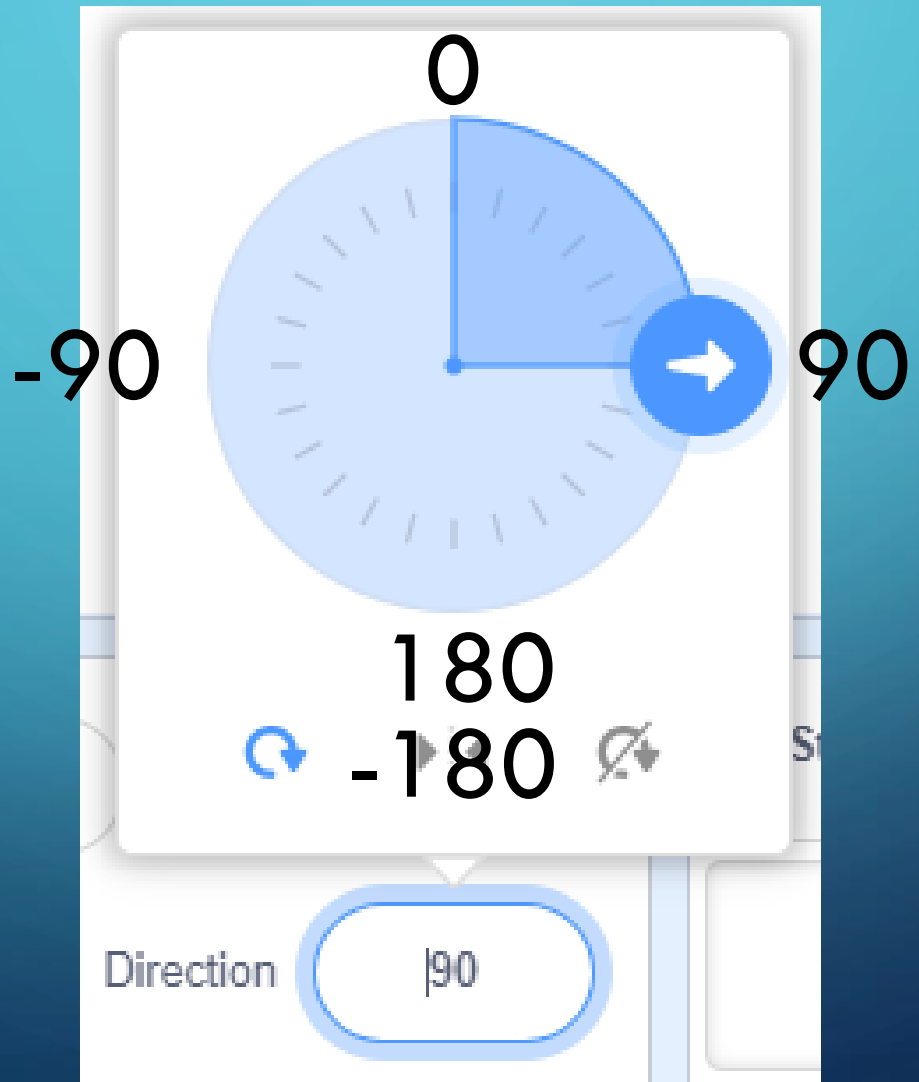


ROTATING THE CHARACTER

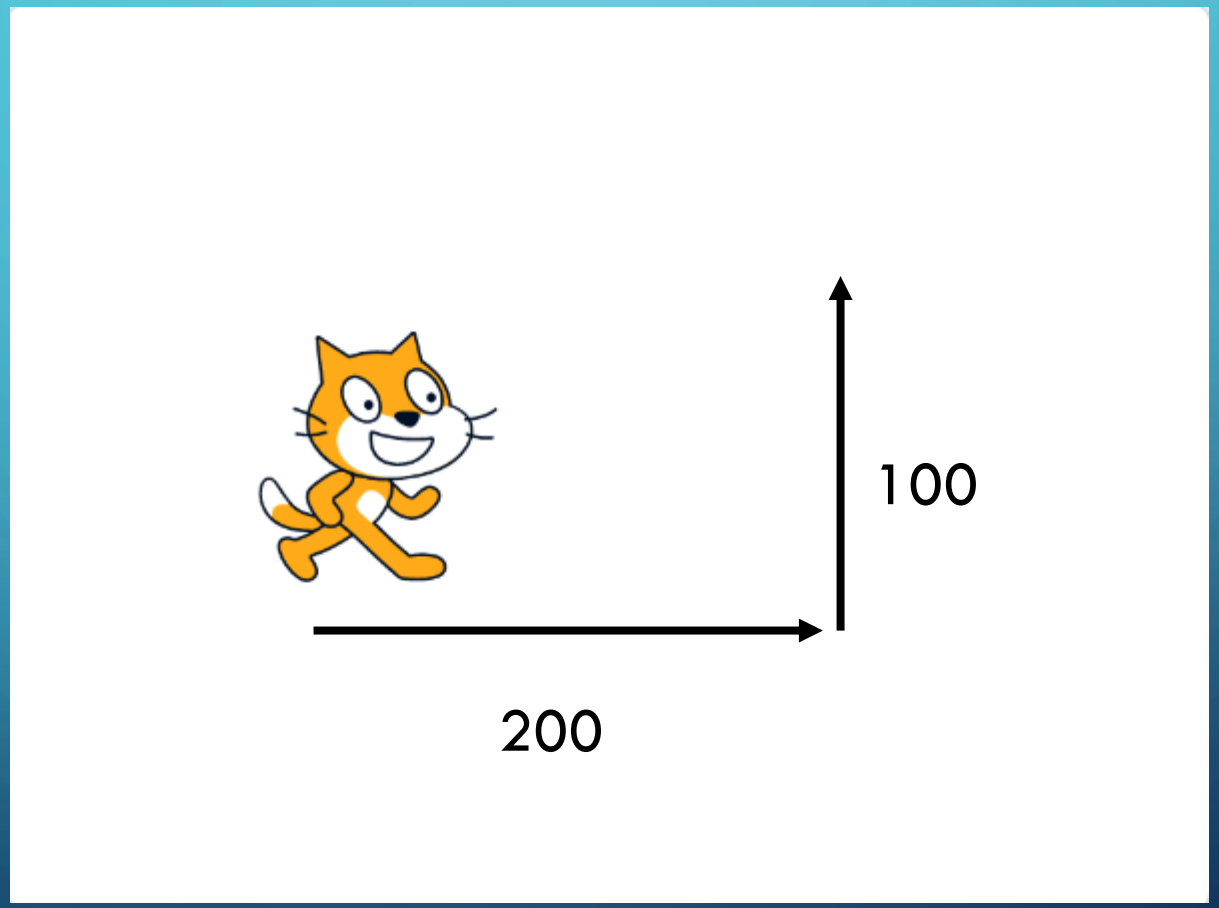
- We can rotate a character in both clockwise and counterclockwise by using these two blocks


Sprite
Sprite1
x
0
Stage
Show
Size
100
Direction
90

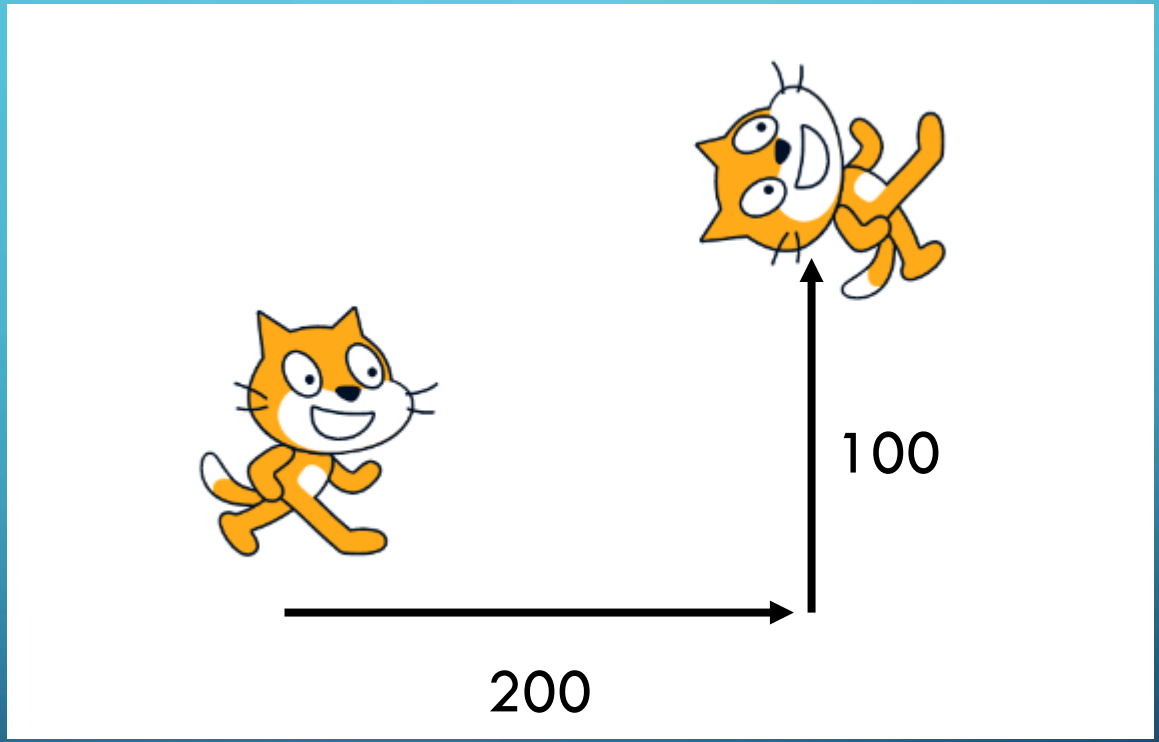
ROTATION



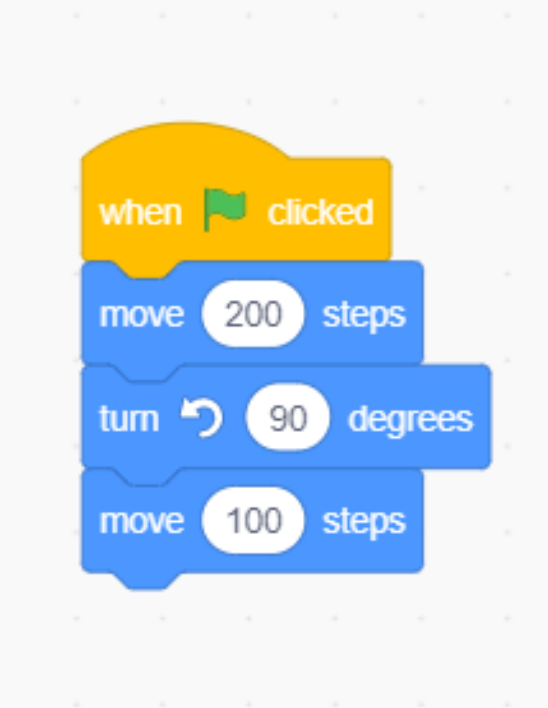
MAKE THE CAT MOVE INTO AN L SHAPE

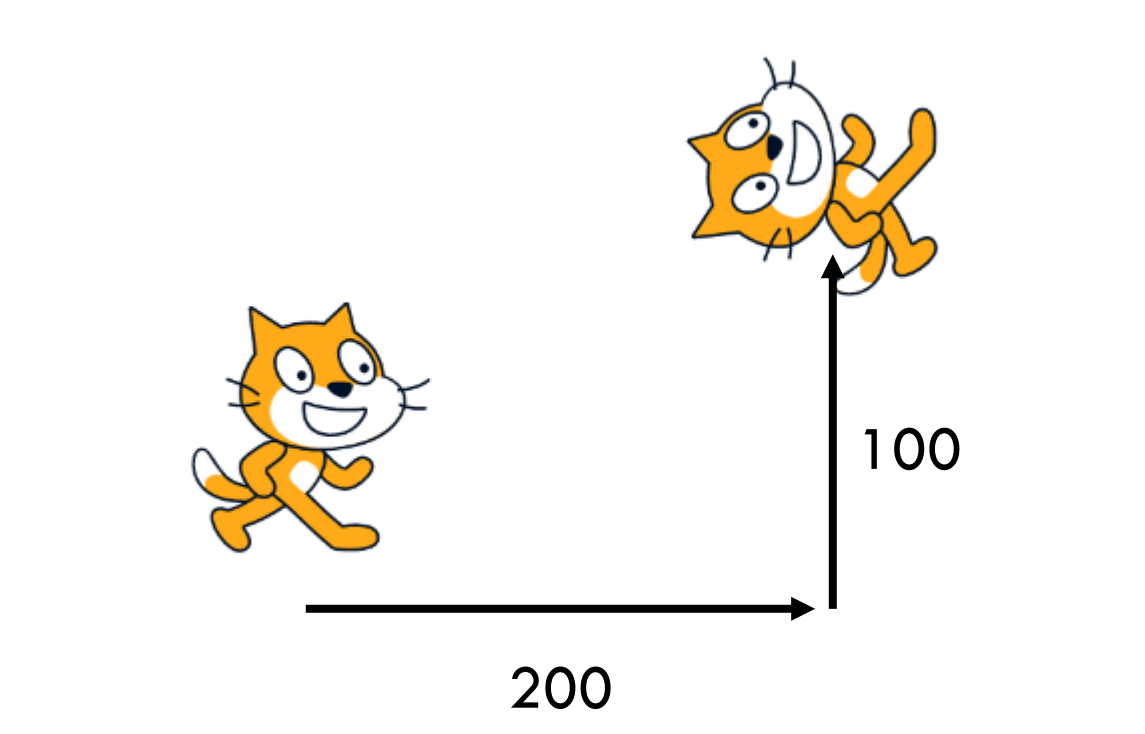


MAKE THE CAT MOVE INTO AN L SHAPE



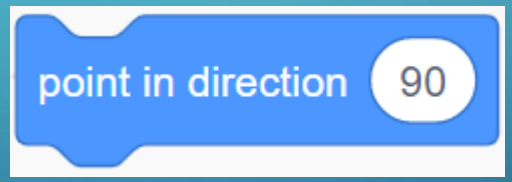
MAKE THE CAT MOVE INTO AN L SHAPE





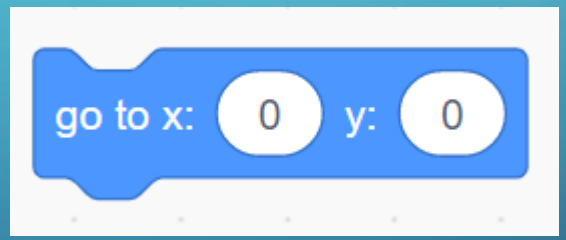
POINTING IN SPECIFIC DIRECTION

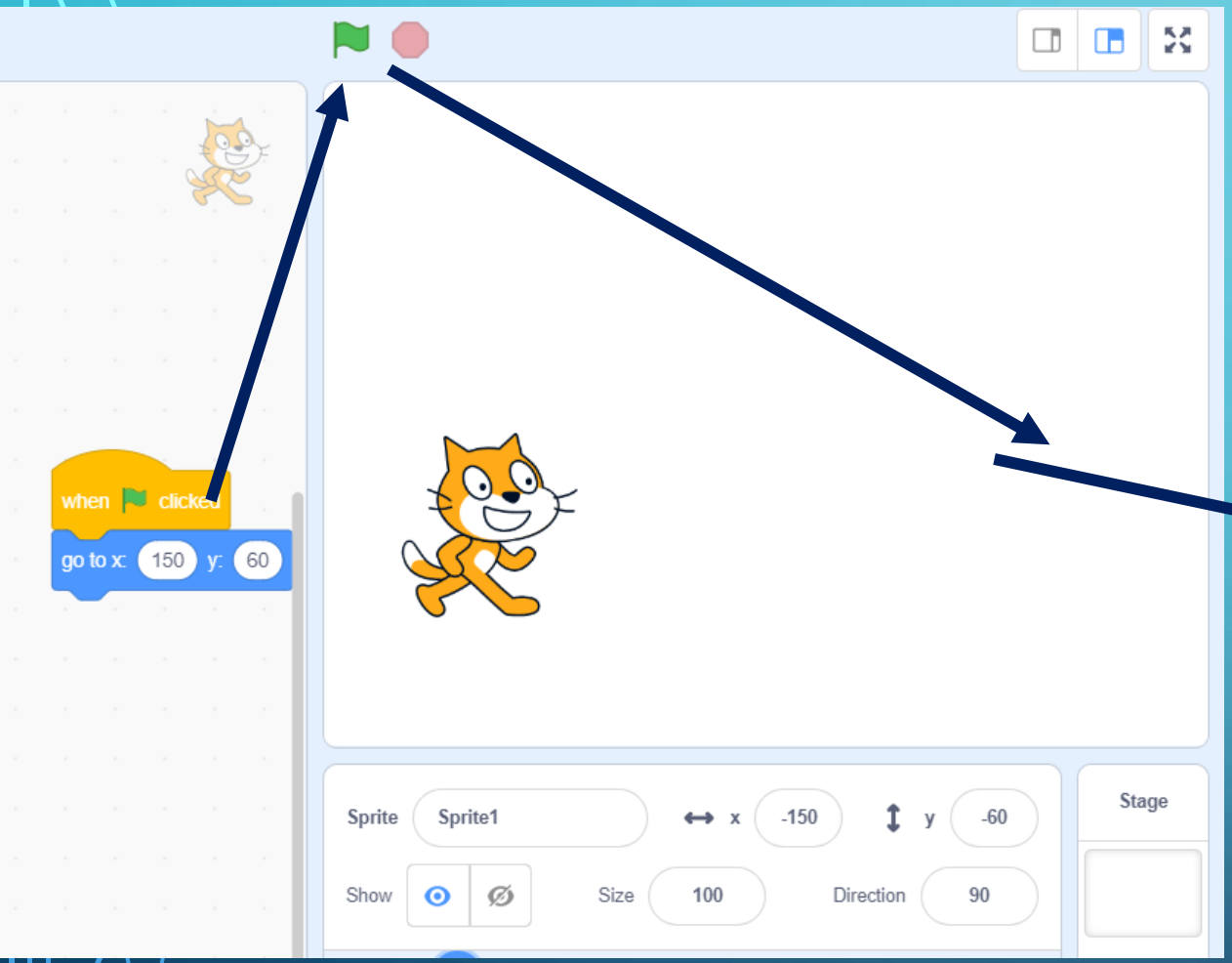
- Instead of rotating our character by a number of degrees we can choose to point him in a specific direction in which we want him to move

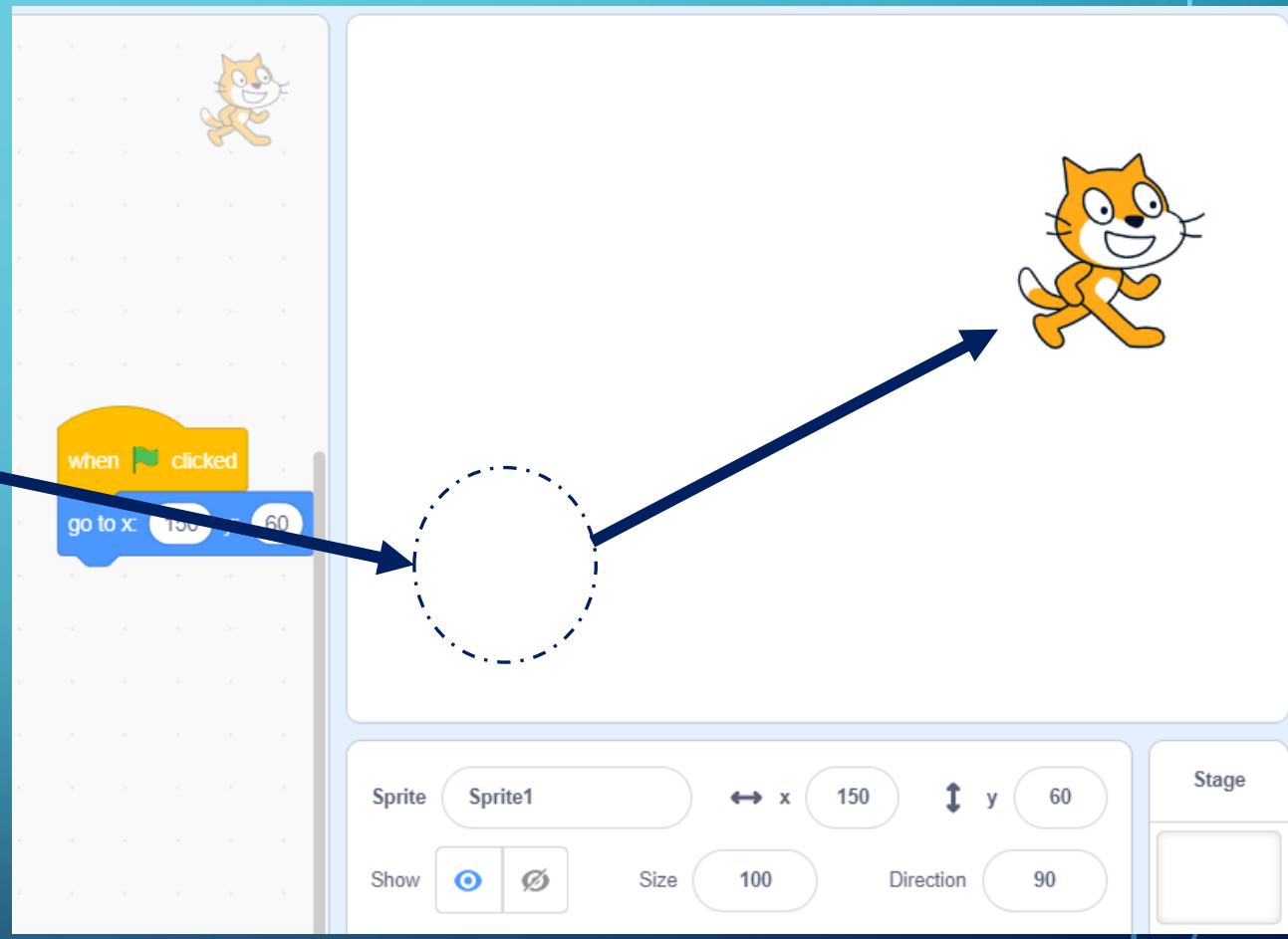


MOVING A CHARACTER TO SPECIFIC POSITION

- With this block of code we can move the character to specified position in the work area. We just need to write the x and y coordinates

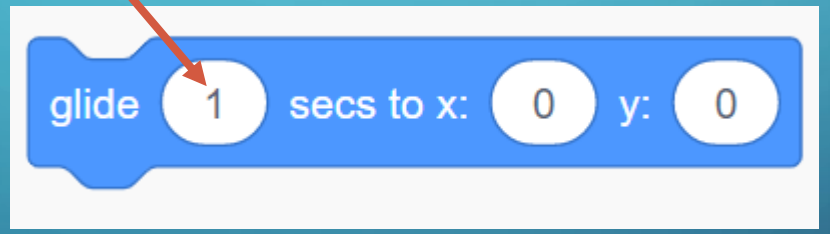



when clicked
go to x: 150 y: 60
Sprite Sprite1 x -150 y -60
Show Size 100 Direction 90
Stage

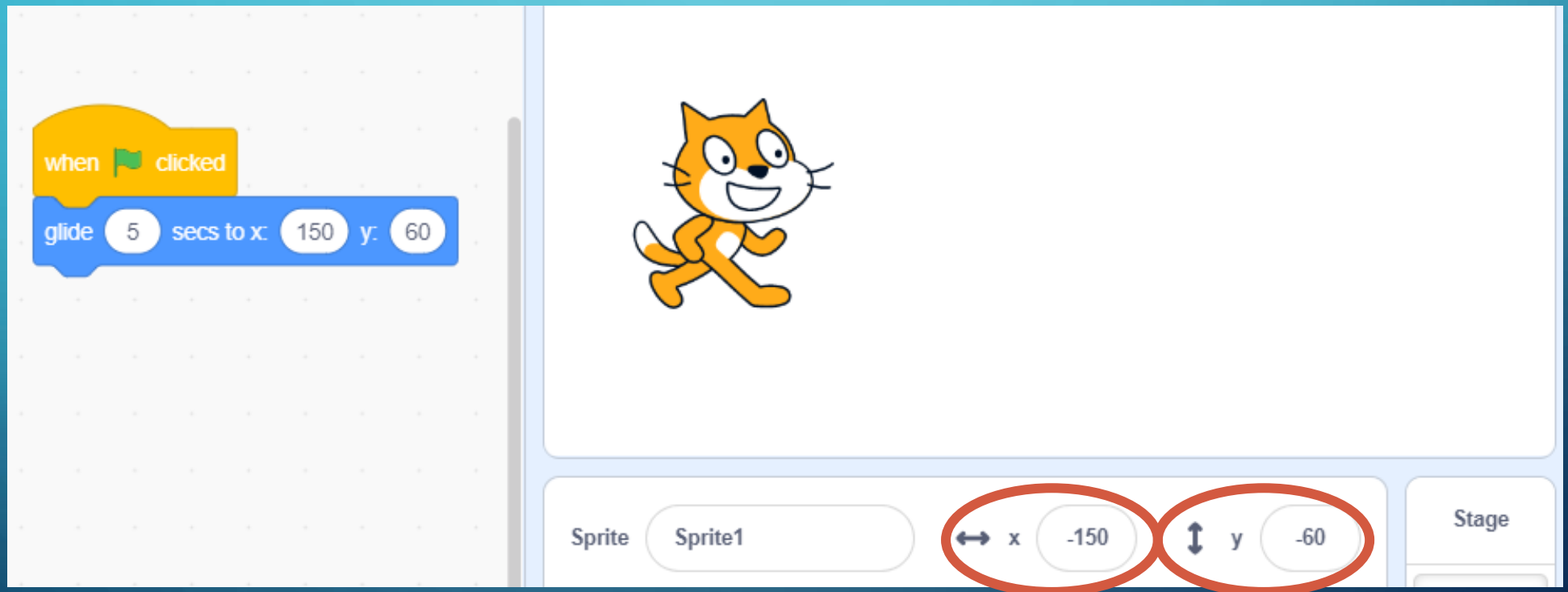

when clicked
go to x: 150 y: 60
Sprite Sprite1 x 150 y 60
Show Size 100 Direction 90
Stage

GLIDING

- With this block the character will move to the specified position but in a slow way. It will take him **n** number of seconds to come to that position

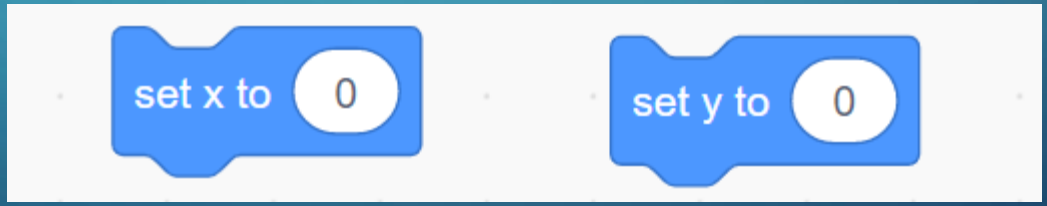


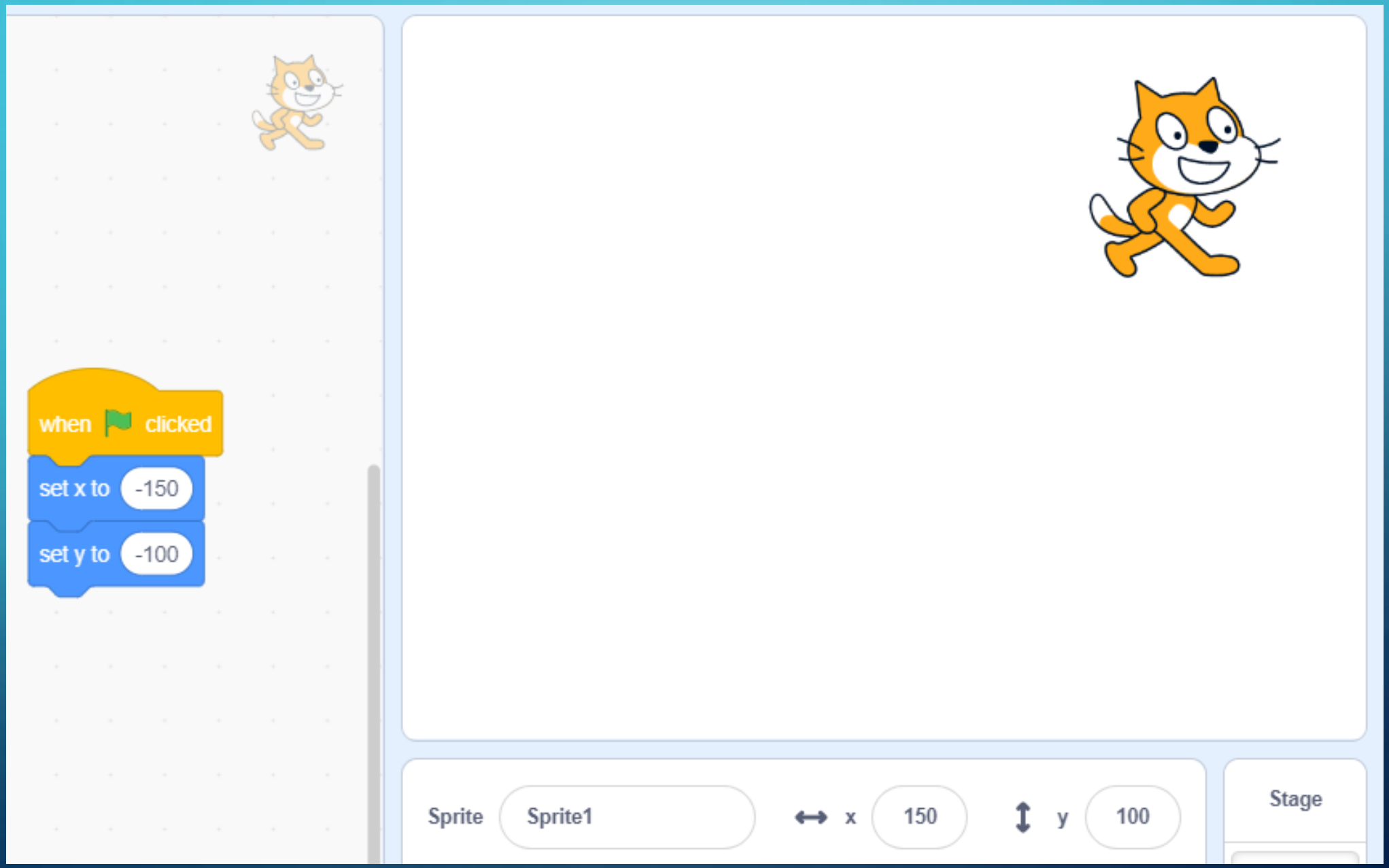
TRY OUT


when clicked
glide 5 secs to x: 150 y: 60
Sprite
Sprite1
x
-150
y
-60
Stage

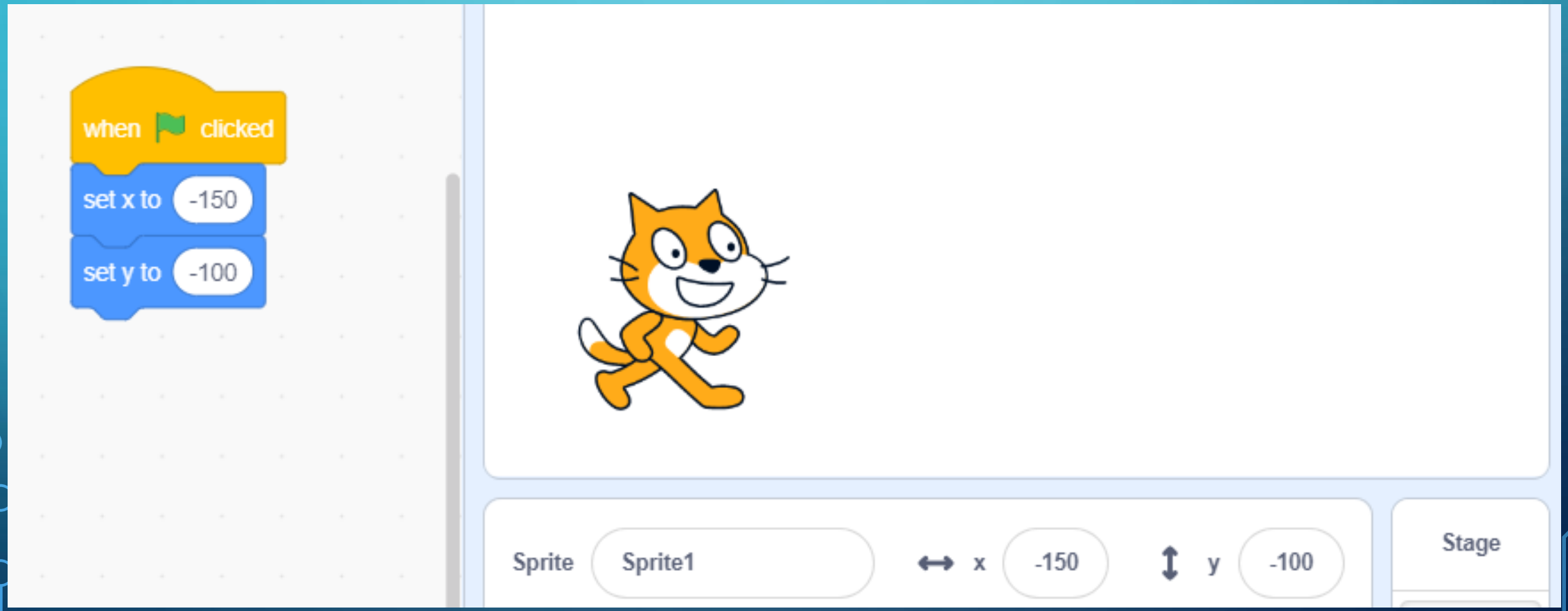
SETTING X AND Y COORDINATES

- With these blocks we can set X and Y position to the desired position
- It means that no matter where the character is on the screen, he will move to the specified position



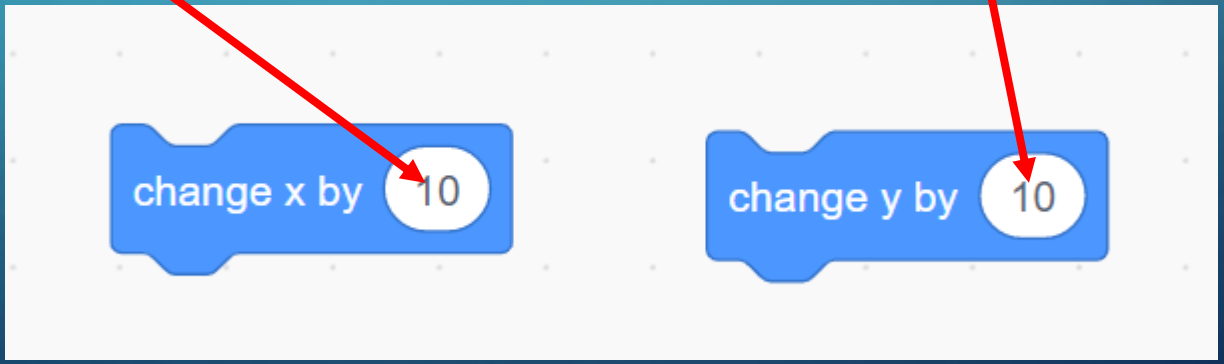

when clicked
set x to -150
set y to -100
Sprite
Sprite1
x
150
y
100
Stage

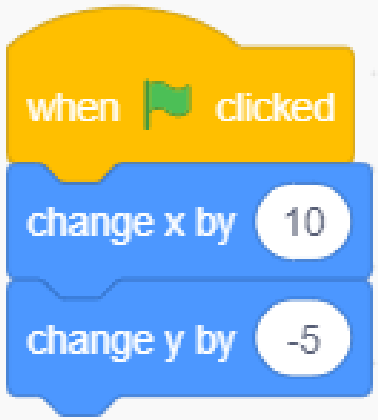

when clicked
set x to -150
set y to -100
Sprite
Sprite1
x
150
y
100
Stage


when clicked
set x to -150
set y to -100
Sprite
Sprite1
x
-150
y
-100
Stage

CHANGING X AND Y BY N

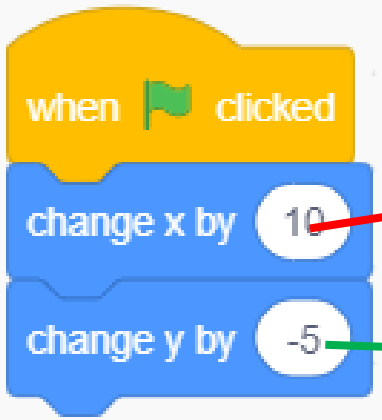
- With these blocks we can change X and Y by an **n** value
- The **n** value specifies for how much it will change





Sprite Sprite1 x 50 y 10

Stage

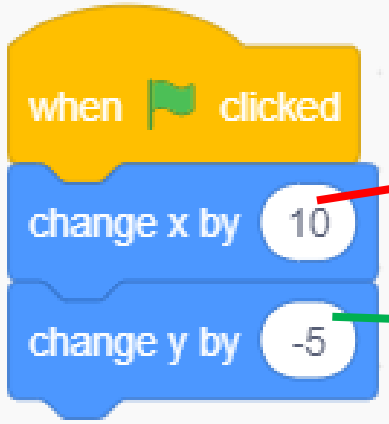


New X = old x + n
New X = 50 + 10
New X = 60

new y = old y + n
new y = 10 + (-5)
new y = 5

Sprite Sprite1 x 50 y 10

Stage



New X = old x + n
New X = 50 + 10
New X = 60

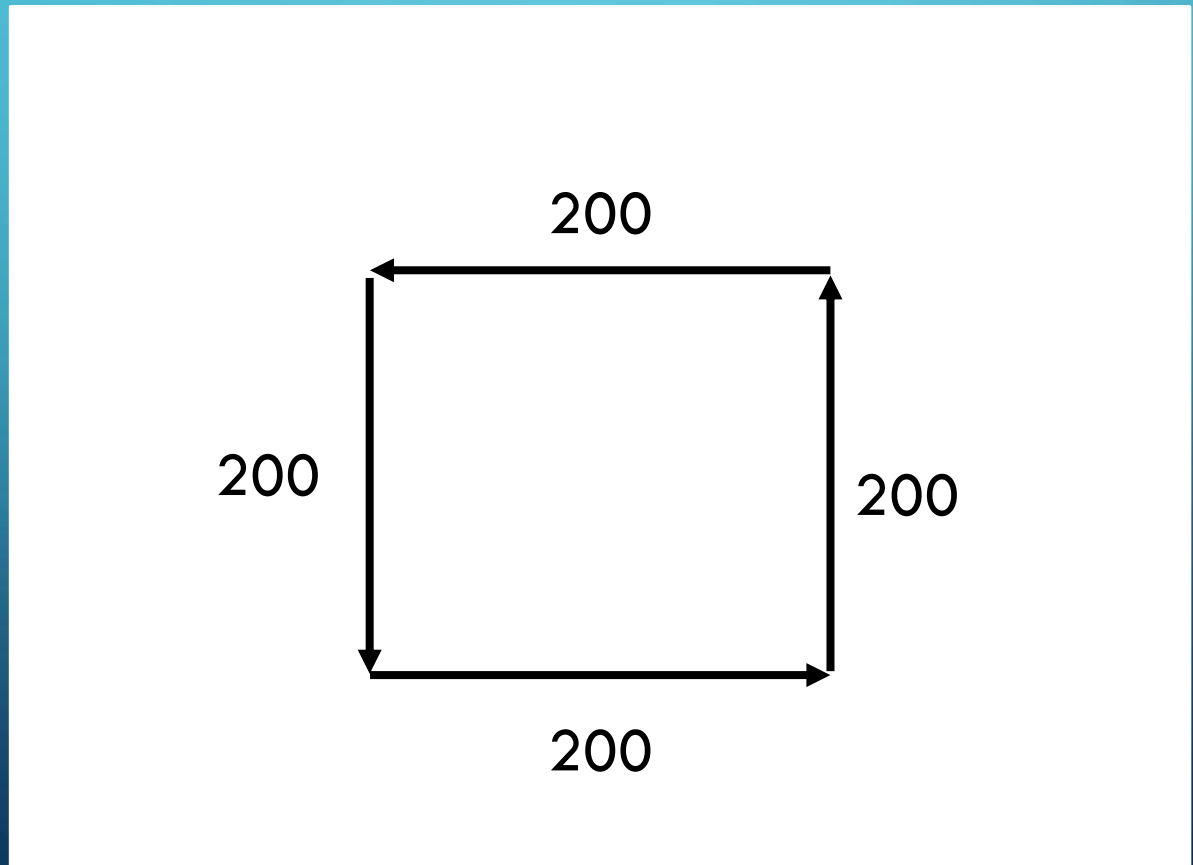
new y = old y + n
new y = 10 + (-5)
new y = 5

Sprite Sprite1 x 60 y 5

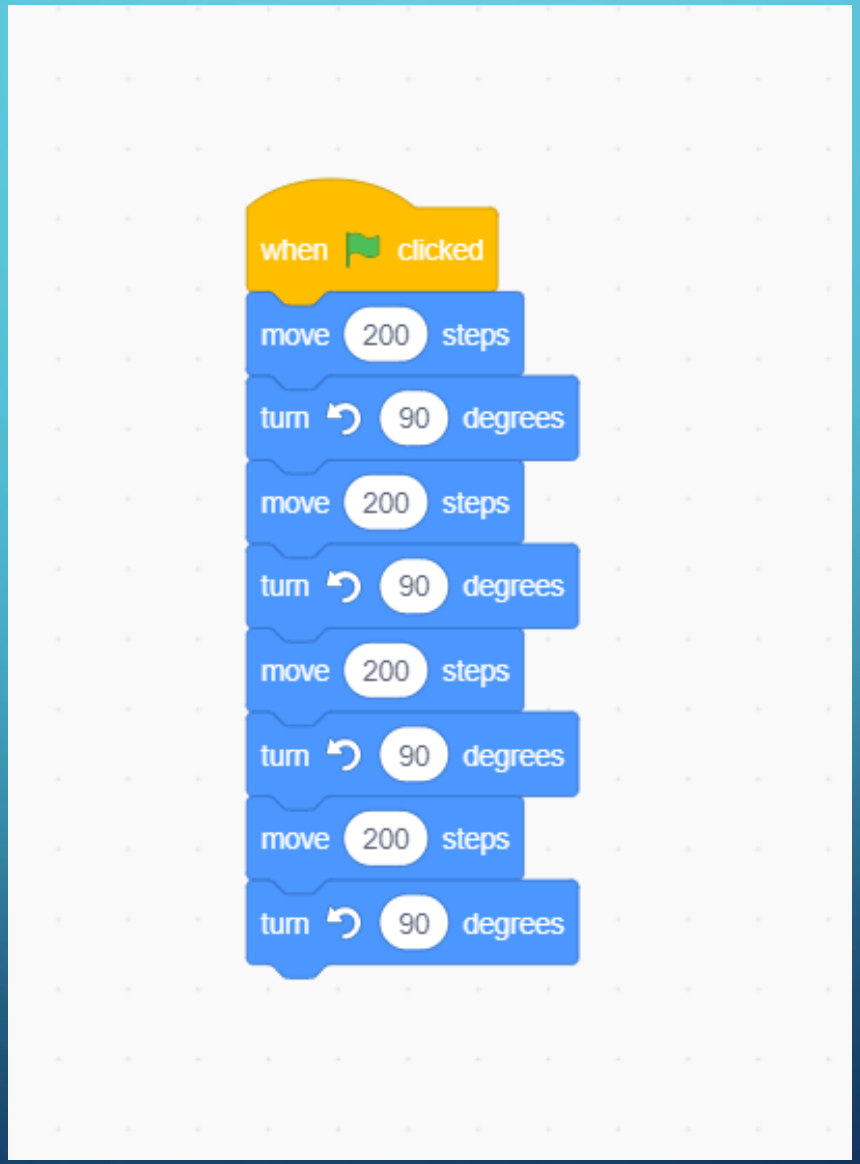
Stage

TASK 1:

- Make character move in a square



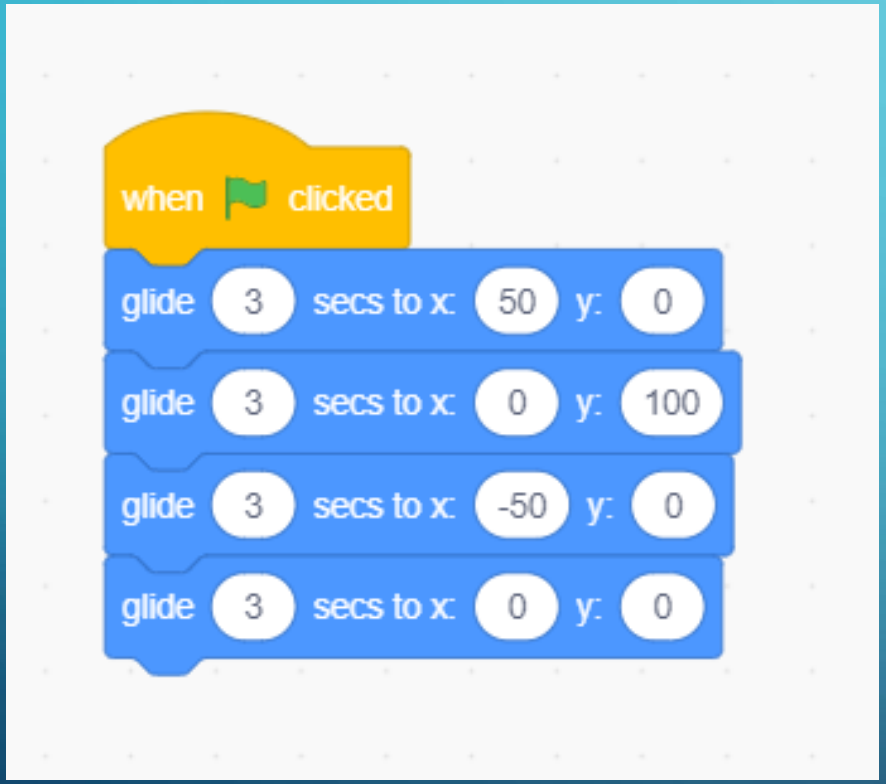
TASK 1:

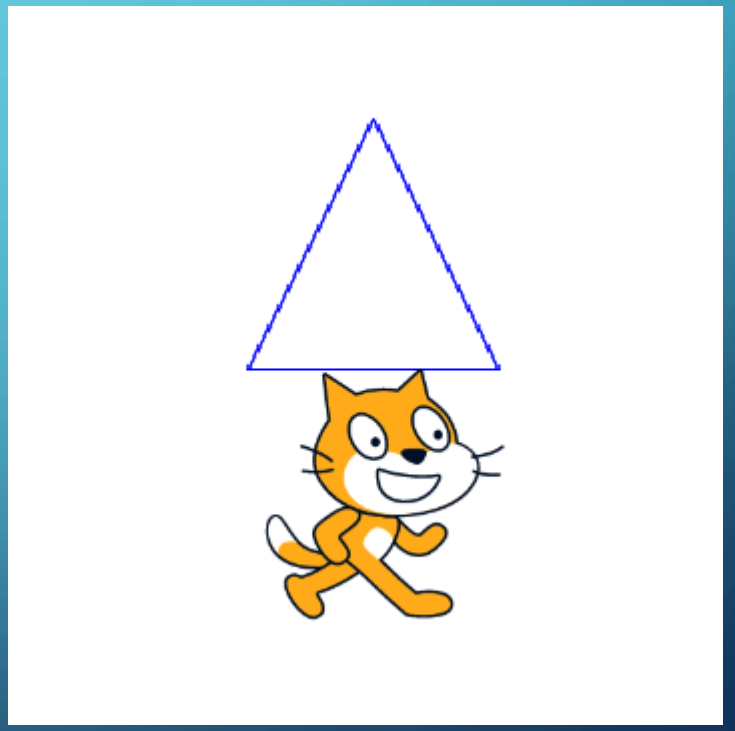

when clicked
move 200 steps
turn 90 degrees
move 200 steps
turn 90 degrees
move 200 steps
turn 90 degrees
move 200 steps
turn 90 degrees

TASK 2:

- Make a program that will glide the cat for 3 sec in these positions
  - Starting position (0,0)
  - Glide to (50,0)
  - Glide to (0,100)
  - Glide to (-50,0)
  - Glide to (0,0)
- How did the cat move?

TASK 2:


when clicked
glide 3 secs to x: 50 y: 0
glide 3 secs to x: 0 y: 100
glide 3 secs to x: -50 y: 0
glide 3 secs to x: 0 y: 0



ANY QUESTIONS?

THE END