BLOCK PROGRAMMING WITH SCRATCH PART I

Programming Language I

Lesson Outcome

At the end of the lesson, you should be able to write program involving:

- Basic Component of Scratch
- Scratch Interface
- Scripting with Scratch Part 1:
  - Looks
  - Events
  - Control
  - Motion
  - Sound

What is SCRATCH

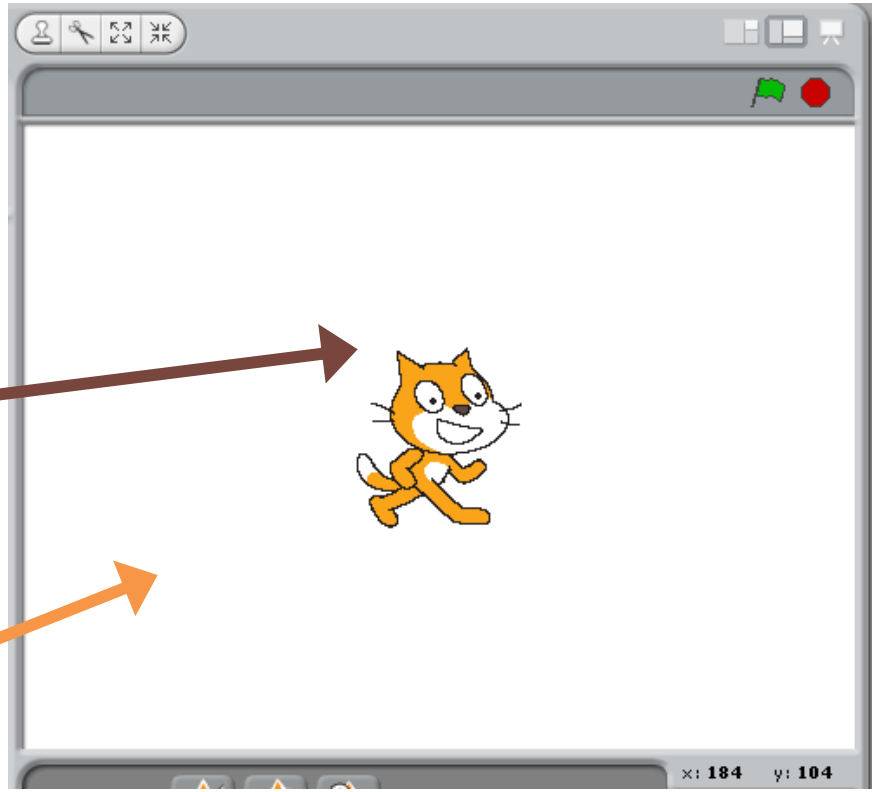
- Scratch is a programming language.
- We can use it to create our own interactive stories, animations, games, music, and art.
- Download from www.scratch.mit.edu

Basic Concept of Scratch

- Scratch projects are made up of a stage and objects called sprites.
- Sprites can be have movement using scripts.
- A script is another name for program or method; a script tells the actor what to do.
- Programming panel; here is where we construct scripts for the sprites
- (Sprites are objects; their scripts are methods or behaviors.)

Stage and sprites

- The stage is where you see your stories, games and animations come to life.
- Sprites move and interact with one another on the stage.

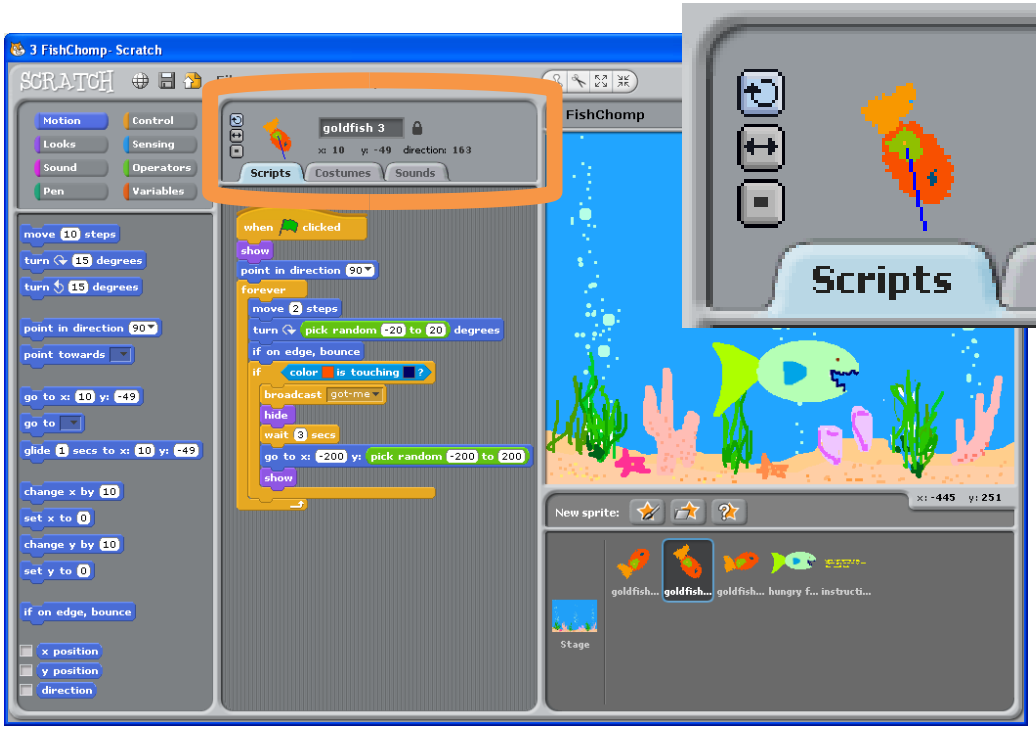


Sprites

- You can create New sprites and find the sprites from the Sprite List

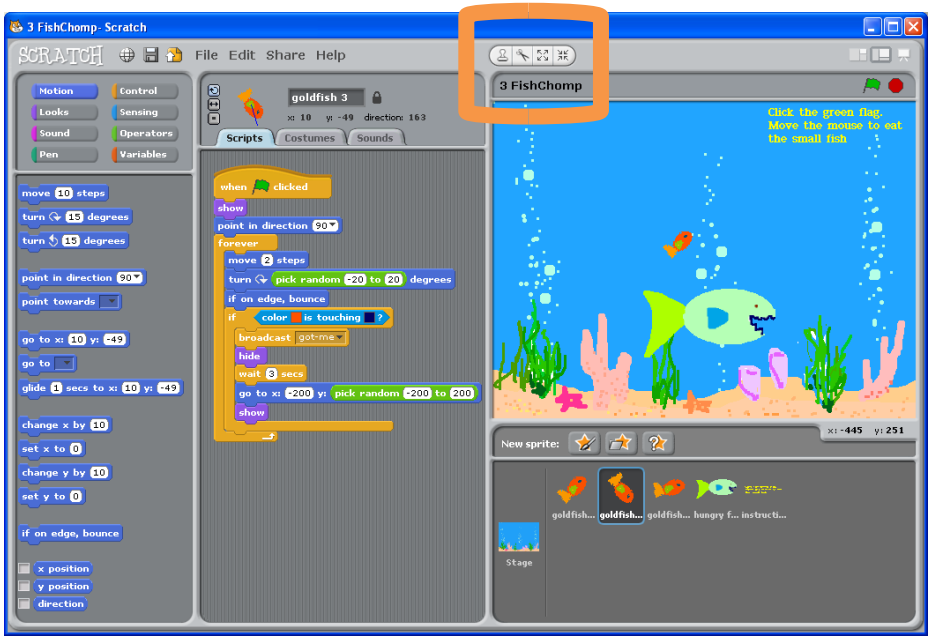
Current Sprite Info

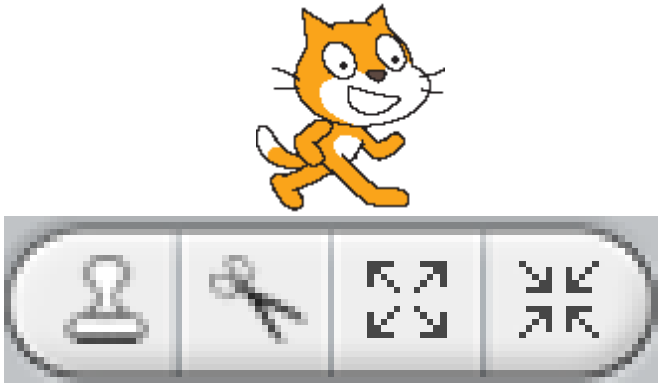
- You can find the sprite's name, position, direction, lock state, pen color and rotation style



Toolbar

- On using the Toolbar, you can make sprites larger or smaller
- You can also duplicate or delete sprites, costumes, sounds or scripts



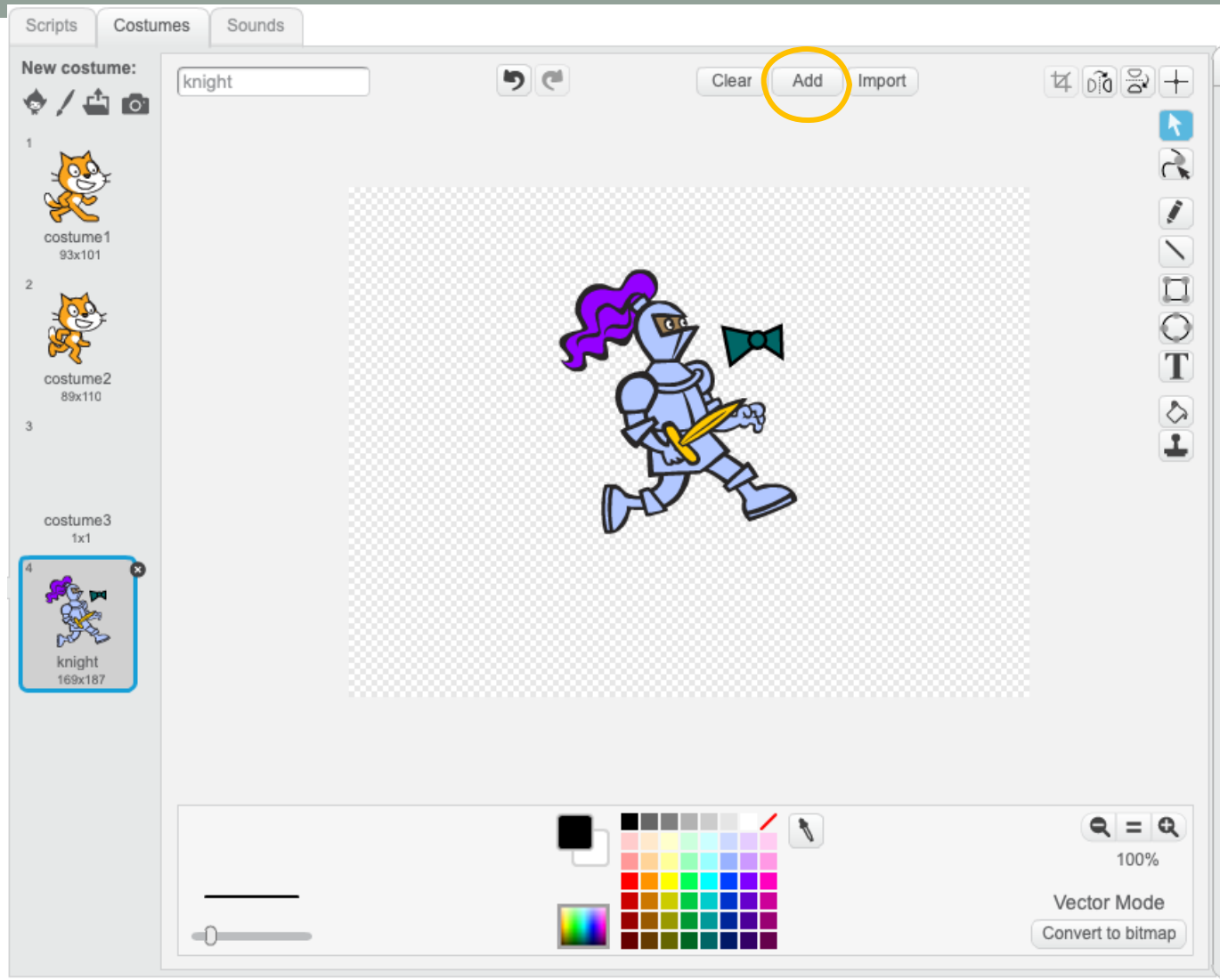


Costume

- You can change how a sprite looks by giving it different costumes.
- You can make a sprite look like a person, a train, a butterfly or anything else.
- You can use any image as a costume.

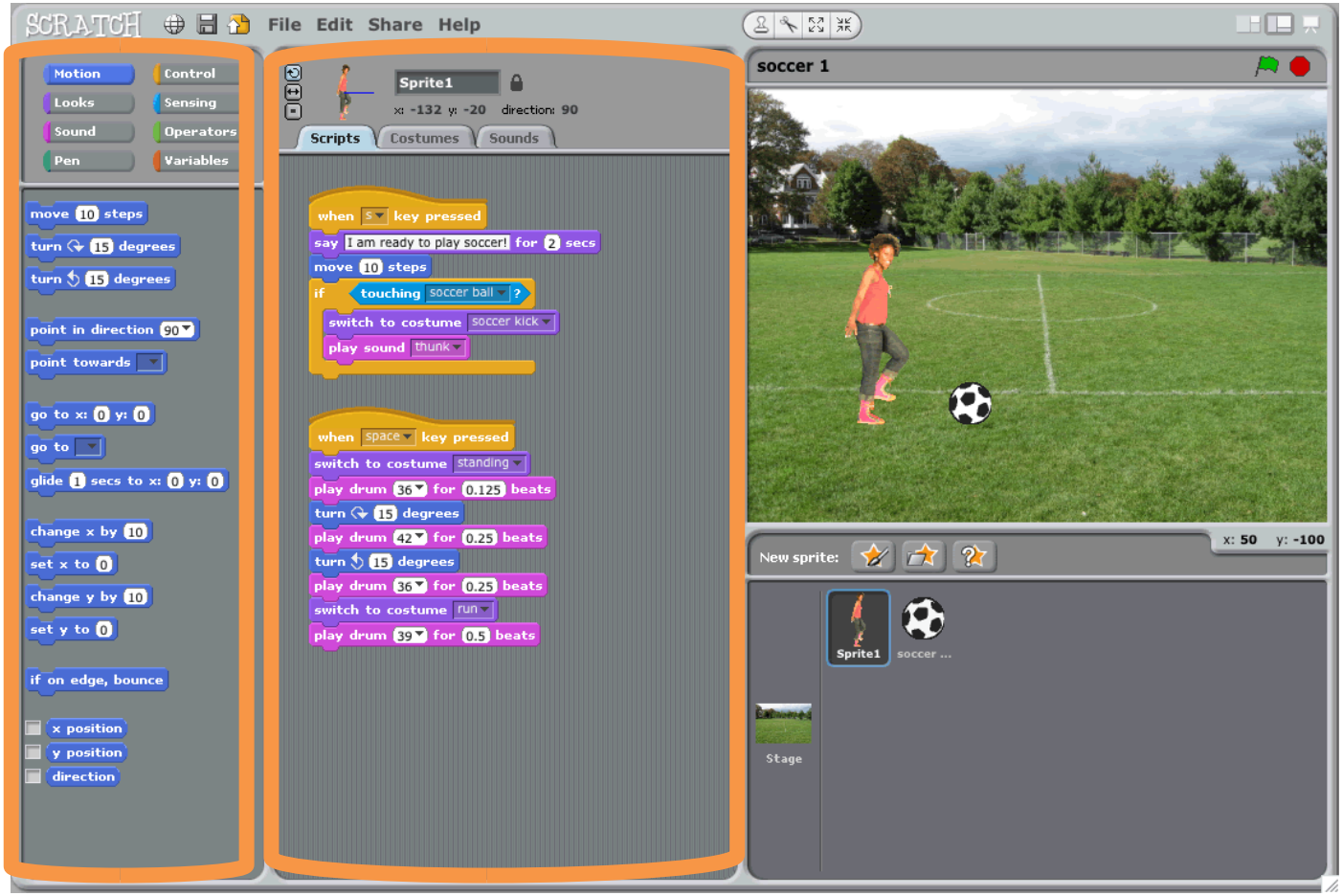


Costumes



- To see different costumes of a sprite, choose the Costumes tab page.
- Choose Add to modify costumes on your sprites.

Blocks Palette and Scripts Area

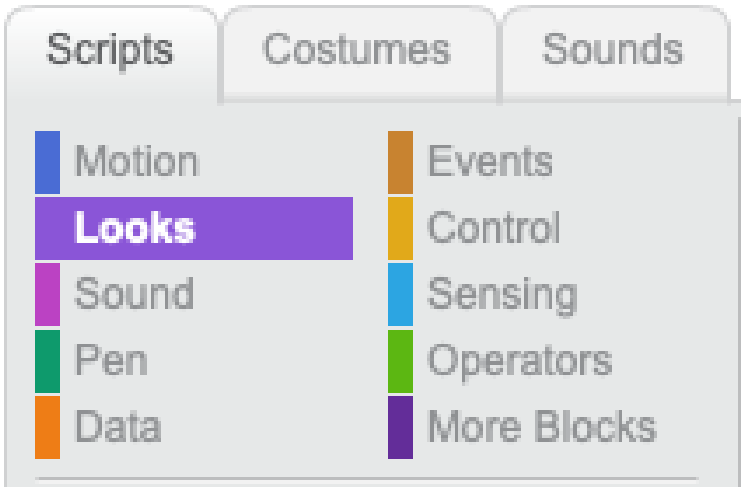


Scripts Area

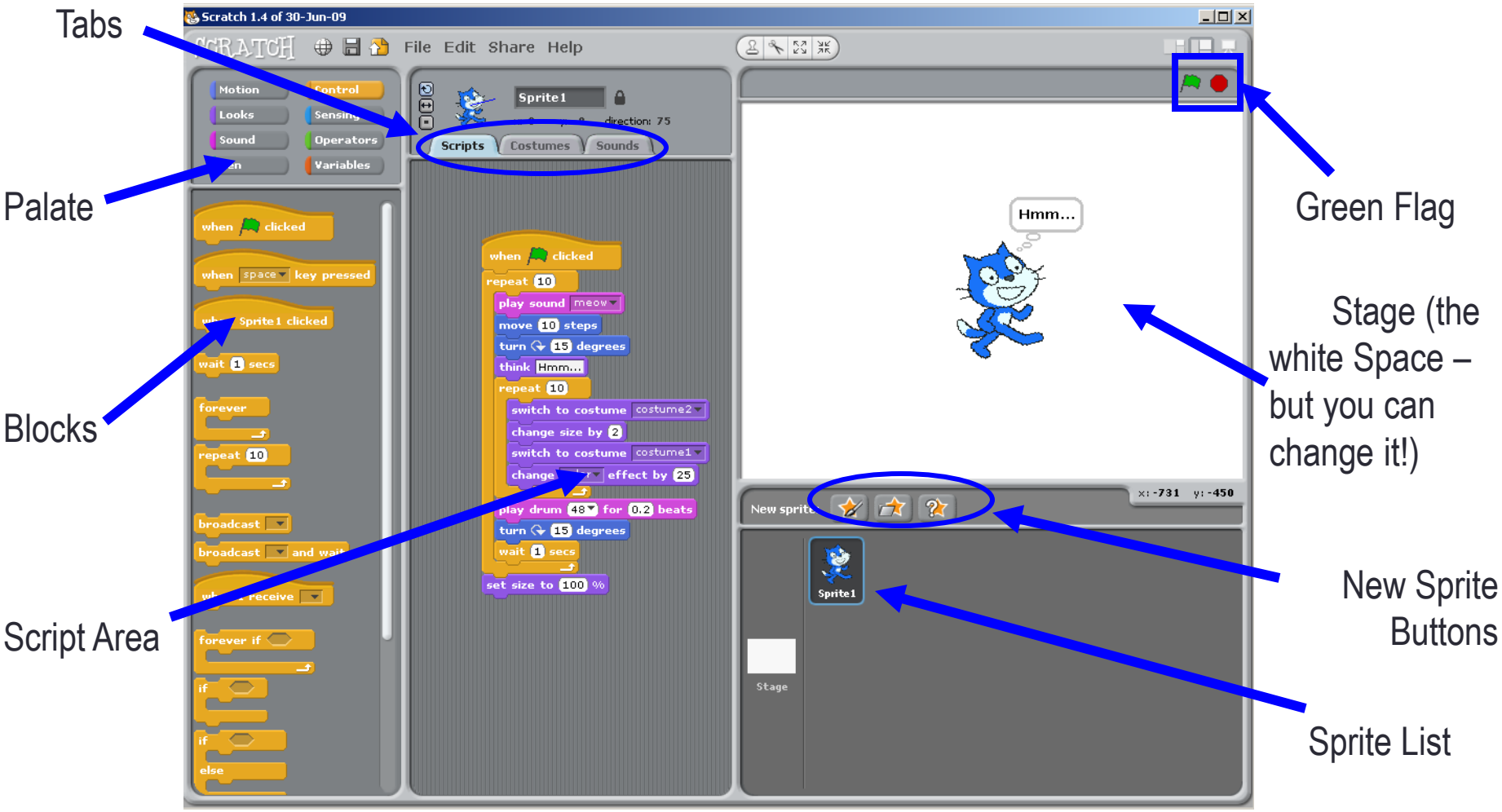
- Block of scripts in Scratch con of

10 template of scripts.

- Drag blocks from Palate area
- Snap blocks together to create a script
- When you double click on a script, your program will run
- Blocks are **color-coded**, based on function



Overall Scratch Program

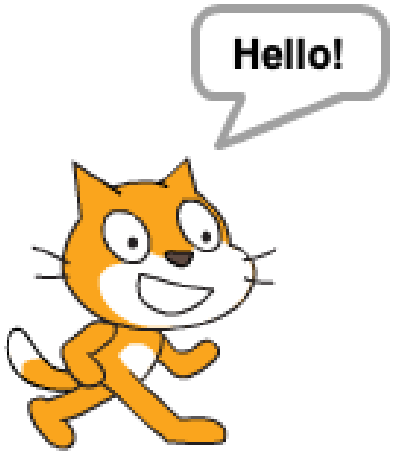


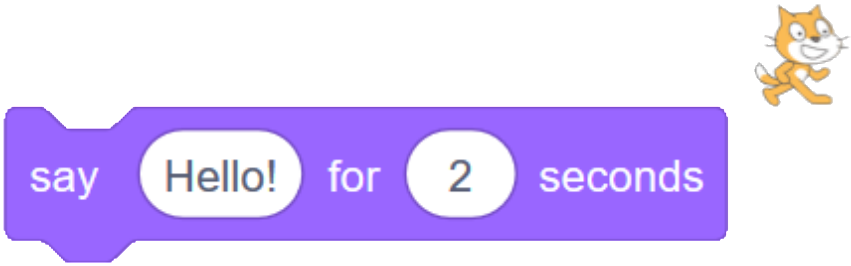
THE LOOKS SCRIPT

Has operations for setting the color, size, and visibility of a sprite.

Activity #1: The "hello" script (program)

- Double click on the "say hello for 2 secs" block
- Check your sprite behavior at the right
- Then **double click** "say hello for 2 secs"





Exercise: Try some other looks operations (double click items to see the effect)

- Change color effect by 25
- Change color effect by 25 again
- Hide
- Show
- Change size by 10
- Change size by 10 again
- Set size to 100%

Activity #2: Let's write a script to

- Say "hello" for 2 seconds
- Then change color by 25
- Then think "Hmm.." for 4 seconds
- Then change color by 75
- Then change size by 200

Drag the instructions from the menu to the center panel. Connect them into a single block. Edit the parameters to get the numbers we want.

Answers:


x: 0
y: 0
direction: 90
Scripts
Costumes
Sounds
say Hello! for 2 secs
change color effect by 25
think Hmm... for 4 secs
change color effect by 75
change size by 200

The WAIT instruction

- is needed to slow down the acting so we can see or hear it properly (computers are too fast sometimes)
- Get the wait instruction from the CONTROL menu.
- Insert a wait in LOOKS script.

3 second pause between changing color and size

THE EVENTS SCRIPT

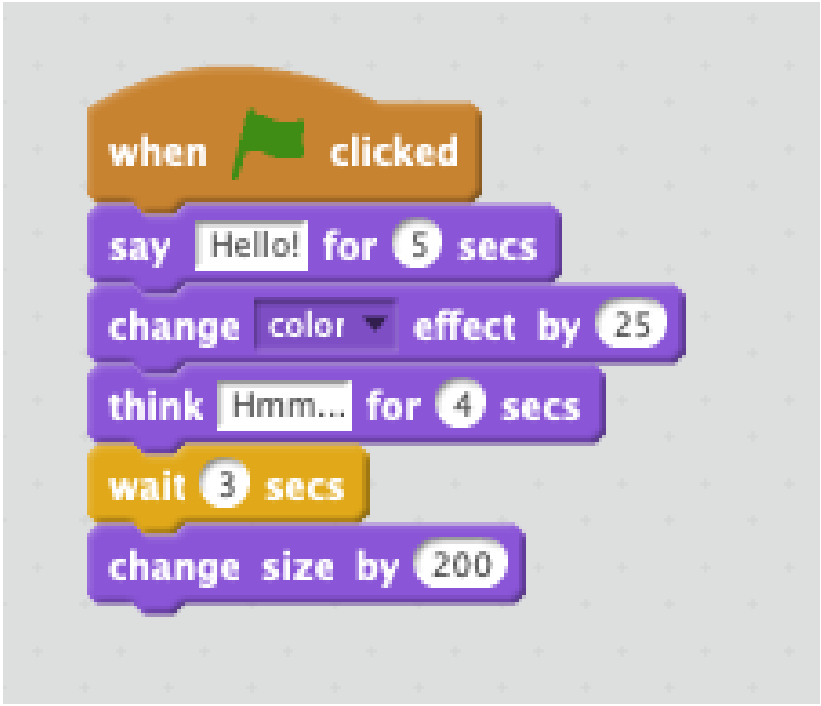
Controls the flow of a programme

EVENT Script

- It **controls** how many times an event happens, how long an event happens, or when an event happens.
- For example: “when flag clicked” block:

- Drag this block out, and snap it on **top of** the blocks you already have in your script.
- Now, instead of having to double click on block of code, we can just click on the flag icon to play the animation.

Activity #3: Use When ..Clicked on your Sprite



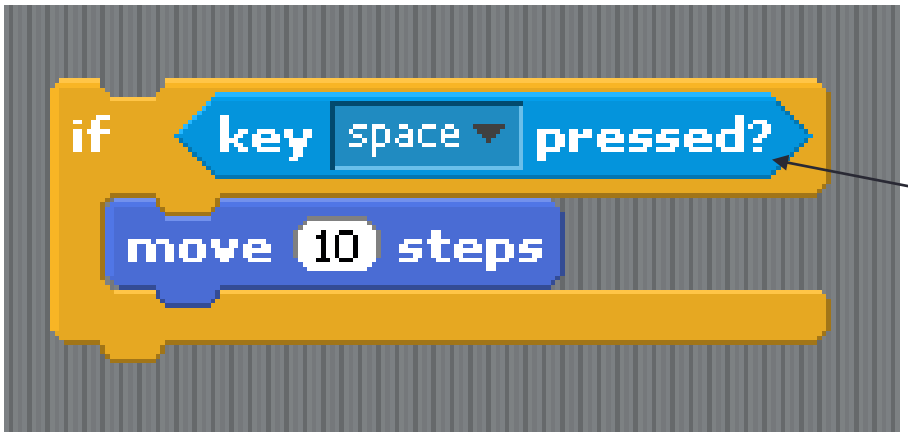
THE CONTROL SCRIPT

How to locate and orient a sprite; position and angle; moving a sprite

Control Script: Conditional Statement

- Powerful blocks in the Control category are the blocks that handle conditional statements.
- Conditional statements are commonly called "if statements" or "if-else statements".

Example: Conditional Statements

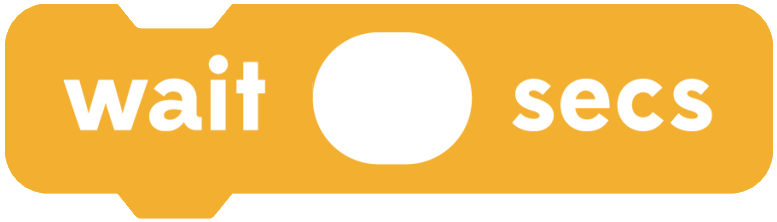


The light blue block has to be inserted from 'Sensing' block

- This code means that if the user presses the Space key on the keyboard, the sprite will move 10 steps.

Example: WAIT

- Another frequent block being used is the WAIT block that we previously used.

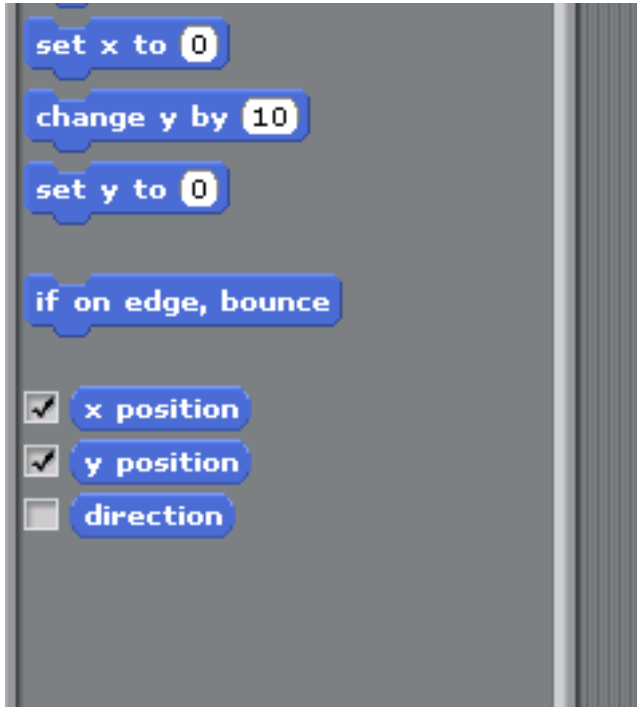


THE MOTION SCRIPT

How to locate and orient a sprite; position and angle; moving a sprite

Position on the stage

- Using the **Looks menu**, shrink our cat to 25%.
- Click on the **Motion menu**.
- Click to check the box for x-position and y-position



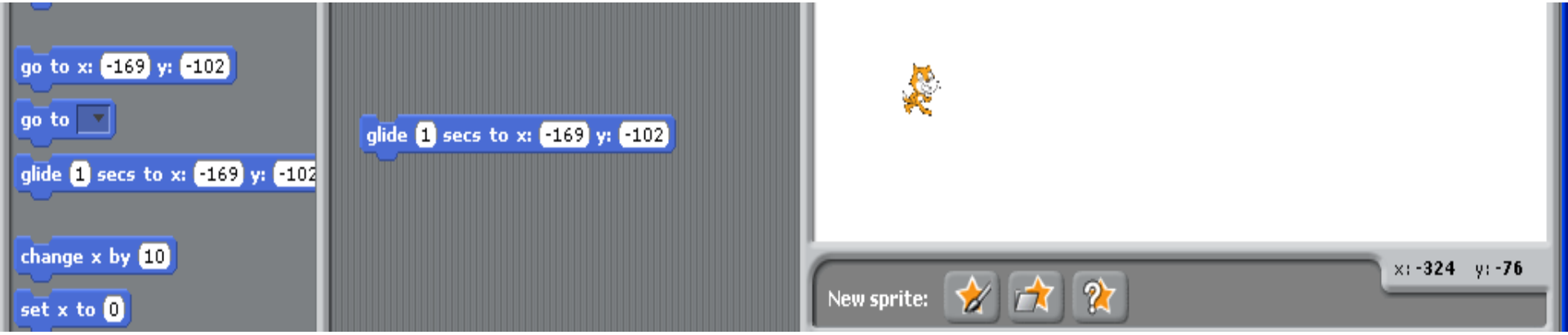
Drag your cat around and note its x-y position.

Other instructions

- goto x,y
- glide to x,y
- Move N steps
- Set direction

The “glide-to” instruction

- Drag the “glide-to” instruction into your script panel.
- Edit in some coordinate values and double click to see where your sprites goes.



THE SOUND SCRIPT

Sound

- We can add sound to our program.
- There are many different ways to get sound in your animation:
  - Using the sound from Scratch library
  - Importing a sound from the Scratch sound library.
  - Recording sound

Try: Using the Sound block

- Observe the outcome of the following script:

Importing Sound From The Scratch Sound Library

- Click on the sprite you want to have sound.
- Click on the Sounds tab and select the Speaker icon.
- You will see different categories of sounds that you can use in your animation that are available for you in the Scratch library.

Adding The Sound To Your Animation

- Now, you're ready to add the sound to your animation.
- Click on the Script tab.
- Select the sprite you want to have sound.
- Now select the Sound button.

Adding Sound

- Now, select one of the blocks that says, "play sound…"

- Select your sound from the drop-down menu by clicking on the triangle next to "pop".

Recording a Sound

- Click on the record button to record a sound
- Click on the red button to start recording
- Click on the square to stop
- You can rename the sound by typing over the name