Chapter1 :

# Getting started with scratch programming

# What is scratch Programming Language?

Invented by MIT, Scratch is an open source system that enables individuals to program interactive stories, games and animations. Instead of typing code, Scratch uses visual blocks like puzzle pieces to create a program. Scratch is very similar to Lego because the number of ways to arrange the blocks is endless

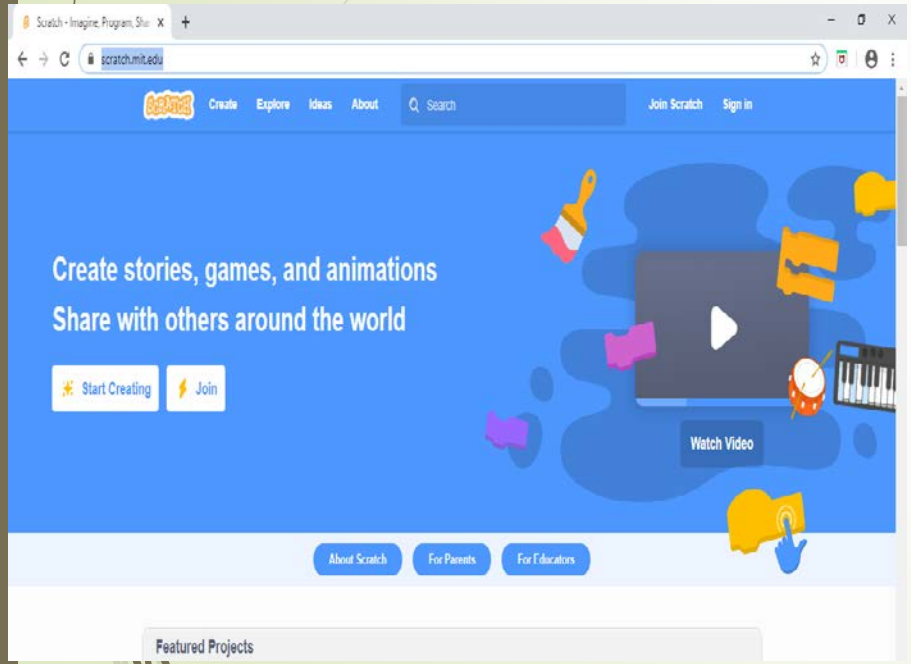
# Benefits of Scratch Programming

- **Scratch enables students to create projects that express their ideas.**
- **Scratch does NOT require syntax**
- **Scratch is a free educational programming language**
- **Students can use Scratch to communicate ideas in many subject areas.**
- **Scratch can be used for sophisticated programing**

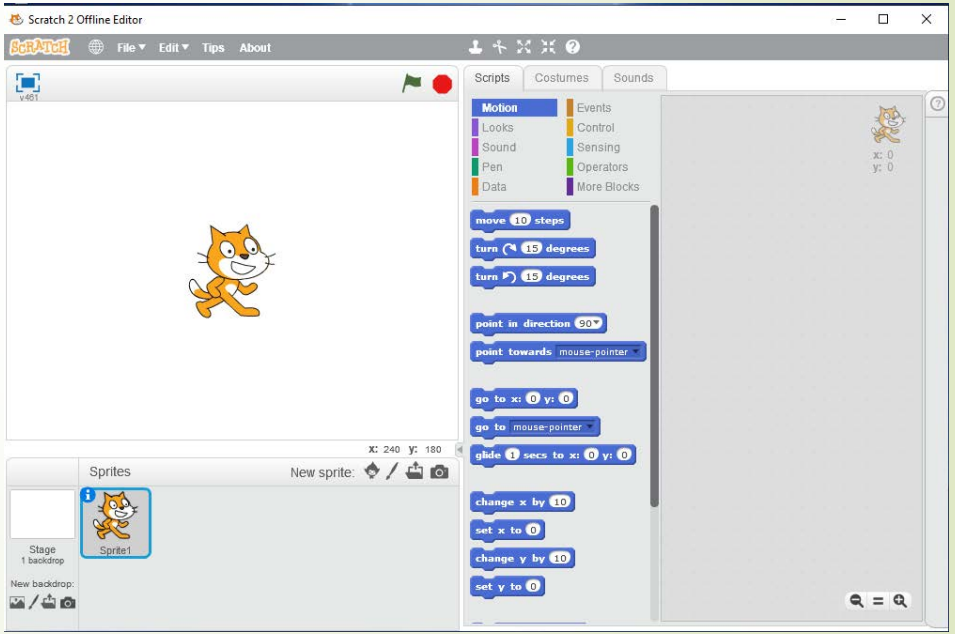
# More Facts about Scratch

Scratch is developed by Lifelong Kindergarten group at MIT led by Mitchel Resnick in2003

Scratch Environment online- visit the website- https://scratch.mit.edu/




Scratch Environment offline –scratch2.0

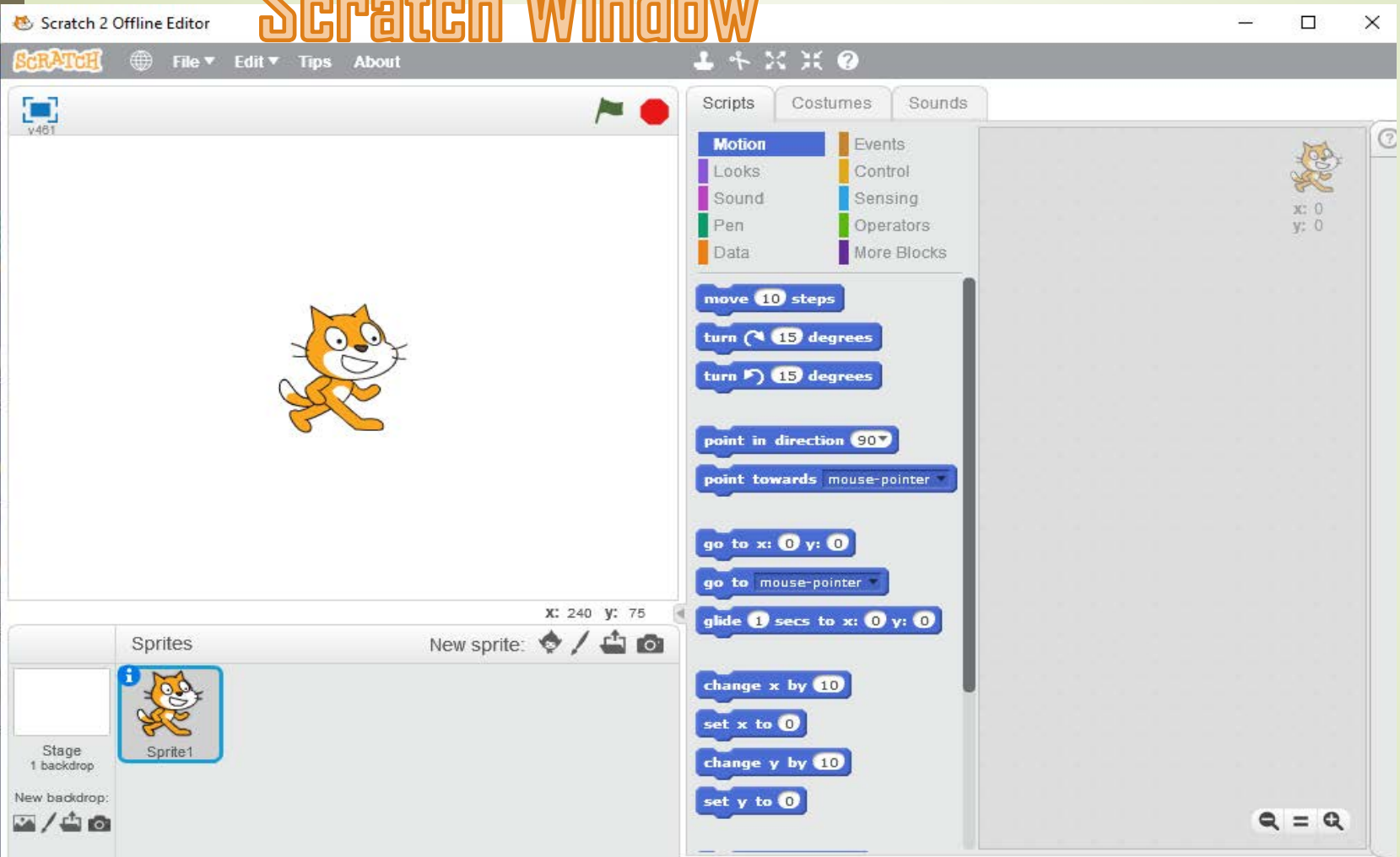


# Steps for installing Scratch 2.0 for windows and Mac

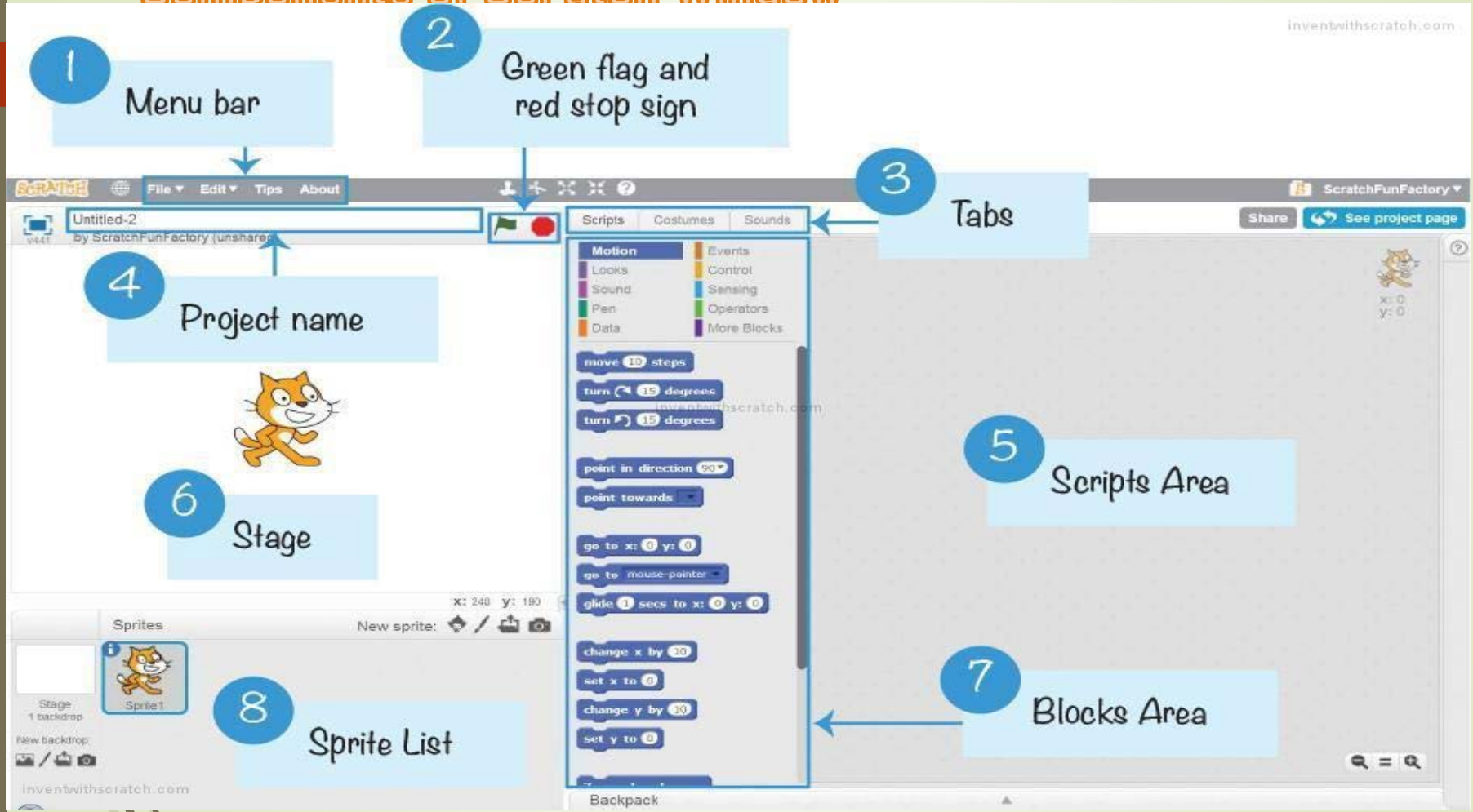
1) Kindly navigate to this site

   https://scratch.mit.edu/download/scratch2

# Scratch Window



# Components of Scratch Window



## The Stage :

The Stage is where your sprites move, draw, and interact. The Stage is 480 steps wide and 360 steps tall. The center of the Stage has an x-coordinate of 0 and a y-coordinate of 0.

## Script Area.

The area on the right side of the project editor where scripts are assembled is called script area. Blocks from the block palette are dragged into the script area so the script area displays a stack of blocks connected to each other.

## Green Flag

The **Green Flag** is a programming feature that, when clicked, will start all scripts in that project that are hatted with the When **Green Flag** Clicked block.

## Sprite

Sprites, either user-created, uploaded, or found in the sprites library, are the objects that perform actions in a project. Most projects have at least one sprite as well because only sprites can move.

## Blocks Tab (Script block)

Blocks in Scratch are divided into 10 categories (palettes): Motion, Looks, Sound, Pen, Data, Events, Control, Sensing, Operators, and More Blocks. Blocks are color coded to help you find related blocks easily.

## Costumes Tab

You can change what a sprite looks like by changing its costume, which is just an image. The Costumes tab contains everything you need to organize your sprite's costumes; y

# More Facts about Scratch

All scratch projects are saved with file extension .sb2 for

Scratch 2.0 and .sb3 for scratch 3 version

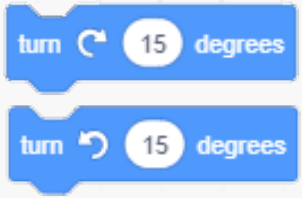
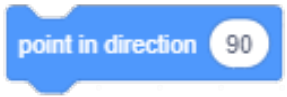
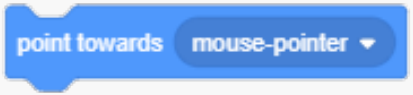
The cat is called a sprite. It is the default sprite character.Sprites understand and obey sets of instructions that you give them

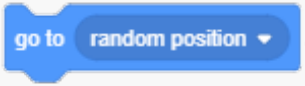
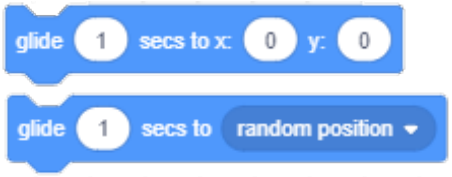
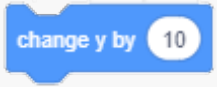
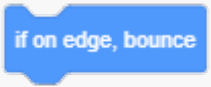
# Motion palette

Motion blocks are color-coded medium-blue and are used to control a sprite's movement. They are available only for sprites.

| BLOCK | FUNCTION |
| --- | --- |
|   | The block moves its sprite forward the specified amount of steps in the direction it is facing. A step is equal to one pixel length |
|     | The blocks turn their sprite the specified amount of degrees clockwise or counter-clockwise (depending on which block is used); this changes the direction the sprite is facing. |

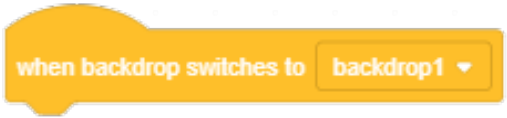
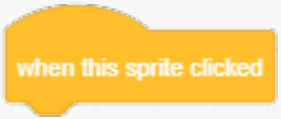
# Different Blocks in Motion palette

| BLOCK | FUNCTION |
| --- | --- |
|   | The block moves its sprite forward the specified amount of steps in the direction it is facing. A step is equal to one pixel length |
|   | The blocks turn their sprite the specified amount of degrees clockwise or counter-clockwise (depending on which block is used); this changes the direction the sprite is facing. |
|   | The block points its sprite in the specified direction; this rotates the sprite. |
|   | The block points its sprite towards the mouse-pointer or another sprite depending on its costume center; this changes the sprite's direction and rotates the sprite. |
|   | The block sets its sprite's X and Y position to the specified amounts. This block has no animation in its movement — it is the simplest way to move a sprite around the screen without displaying any animation (i.e. gliding). Therefore, this block is used whenever a sprite needs to jump to another spot. |

| | |
|---|---|
|  | The block sets its sprite's X and Y position to that of the mouse-pointer or another sprite — in other words, it moves the sprite to a random position, the mouse-pointer, or another sprite. |
|  | The block moves its sprite steadily to the specified X and Y position in the specified amount of seconds - this is like pointing the sprite in a direction and repeatedly using Move () Steps, but with more precision. A disadvantage of the glide block, however, is that it pauses the script while the sprite is moving, preventing the script from doing other things while the sprite is gliding. |
|  | The block moves its sprite costume center's X position by the specified amount |
|  | The block changes the selected sprite's X position to a specified value. |
|  | The block moves its sprite's Y position by the specified amount. |
|  | The block sets its sprite's Y (up and down) position to the specified amount. |
|  | The block checks to see if its sprite is touching the edge of the screen with the move steps block — and if it is, the sprite will point in a direction that mirrors the direction from which it is coming. It uses a line perpendicular to the edge to determine the reflection angle. |

# Event Block

Events blocks are color-coded burnt orange and are used to sense events, which trigger scripts to run. Event blocks are essential for every project: without the hat blocks from this category, a project would not be able to begin except by manually running scripts.

| BLOCK | FUNCTION |
|---|---|
|   | Scripts that wear this block will activate once the Green Flag has been clicked — these scripts can activate other scripts and enable the entire program. |
|   | Scripts placed underneath this block will activate when the specified key is pressed. |
|   | Scripts that wear this block will be triggered once the specified backdrop has been switched to on the Stage. |
|   | Scripts that wear the block will activate once its sprite or clone of the sprite is clicked. Contrary to its definite name, the block will also execute the clone's script when the clone is clicked on. |