LITTERA PUBLIC SCHOOL

CLASS III   **COMPUTER**

CHAPTER 8

PROGRAMMING CONCEPTS WITH SCRATCH

Scratch

Scratch is a software which help you to understand and create many games, create animated stories. It help to make the young students learn game creation with ease. There are many versions of Scratch .The latest version is **Scratch 3.0**

- The official website of scratch is www.scratch.mit.edu
- Scratch was created by Mitchel Resnickat the MIT Media Lab in 2007

Uses of Scratch

- In scratch , there are colorful objects to make program creation fun and easy.
- You can create animations, quizzes , and stories.
- You can create and share your scratch projects online on the scratch website.
- The website also has an option to see projects created by others in scratch. You can even make changes to the projects created by others.

- the background is called **backdrop**.

- **Sprite** – It is the actor who acts on the stage. Sprite is an object in Scratch that performs the function on stage area. The default sprite in Scratch is an orange cat.

- **Go Button** – It is the **green flag** and when you click on it, it runs a Scratch
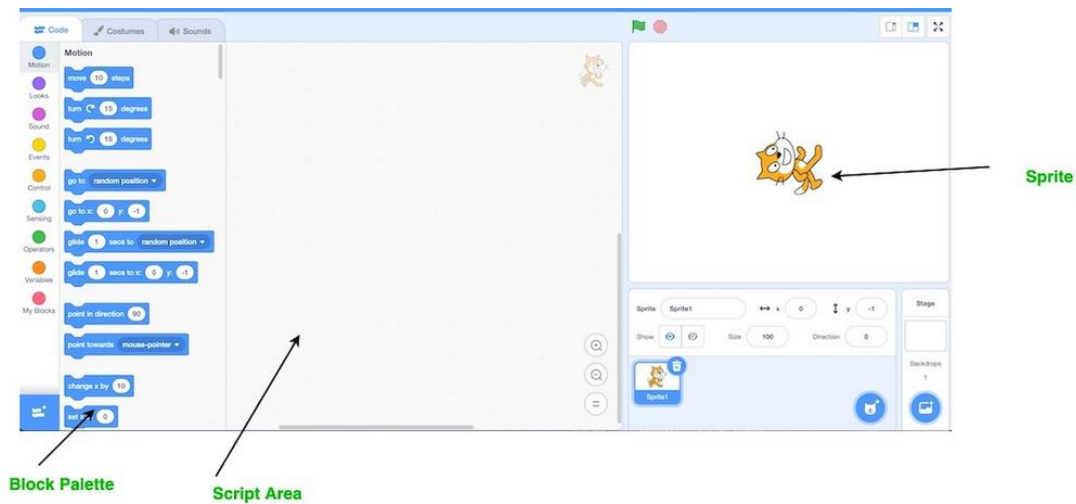

program.

- **Stop Button** – It is the **red button** which on clicking stops the running of Scratch program.

- **Sprites Info Pane** – It is just below the Stage area. It shows all the details of sprites and backdrops used in a project. You can **add, delete, see the name and location, increase and decrease the size of a sprite**. Similarly, you can add or change the backdrop.

- **Block Menu** – It displays the categories of blocks based on their function and use. These blocks within the same category share the same colour which allow better distinction of the parts of a program.

- **Coding Area** – It is also called the scripts area where you stack your blocks to create scripts. If you save a project with a script, the script will also be saved. When we click on a script, all the blocks execute from top to bottom.

Block Palette   **Script Area**

- **Script** – Script is a collection of a number of stacked blocks. It gives stepwise instructions to a sprite to do something on the stage. Script is actually a program which gives the instructions in the form of blocks. A script must have at least two blocks.

- **Backdrop** – It is a background of the stage.

- **Tabs** – Scratch has mainly three tabs which are described below:

a) Code Tab – It contains block categories and the list of blocks in a category. Some block categories are – **Motion, Looks, Sound, Pen, Events, Control, Sensing, Operators, Variables** and **My Blocks**. All block categories are in different colour. The blocks create scripts. In scratch, each block performs a task in a project. The blocks connect to each other like a jigsaw puzzle.

b) Costumes Tab – In this tab, you can add and make changes in the appearance of the Sprites and **backdrops.**

c) Sounds Tab – In this tab, you can add and make changes in the sounds of the sprite and backdrop.

### *Making a Sprite Move*

Step 1. Select a Sprite.

To start coding in Scratch, we need to create something called a sprite. Every entity in a Scratch project is a sprite. These sprites are characters in your game, which can move around and execute code. By creating scripts for the sprites to execute, we can give them commands and tell them to do anything we want!

Right now, the only sprite in our project is the Scratch Cat, who is in every project by default. If you want to create a new sprite, you can click the Choose a Sprite button, found in the bottom right of the screen. If you simply want to make the cat move, you can skip ahead to step two.
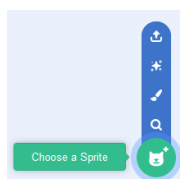
Select a Scratch sprite character using this button at the bottom right of your new project screen.

Clicking this button should bring you to the Sprite Menu, a library of different sprites which you can use in your game. Click on whichever character you like, and Scratch will create them as a new sprite in your game.
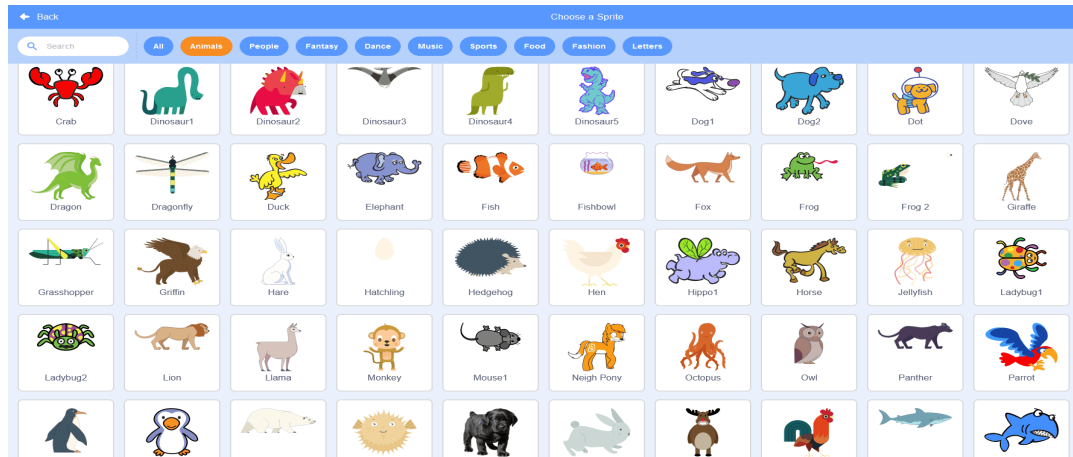
Scratch offers a wide variety of sprites for you to customize your project with.

For our project, we'll use a hedgehog as our first sprite. This is one of the default sprites in the menu, so anyone that wants to can follow along! However, the code to make characters move works for any sprite. You should choose a sprite that sparks joy. Later on, you can expand your project by adding in a cool background and more characters.

Now that we've picked out a character for our game, we no longer need the Scratch Cat sprite. We can get rid of it by clicking on it in the sprite menu, then clicking the trash can symbol next to its menu icon.

Changing Sprite's Costume

Add an Apple from the Sprites library.

Click on **Costumes** tab to open Costume editor.

Set **Fill** Colour, **Outline** Colour and use the editing toolbar to make changes in the look of Apple sprite.
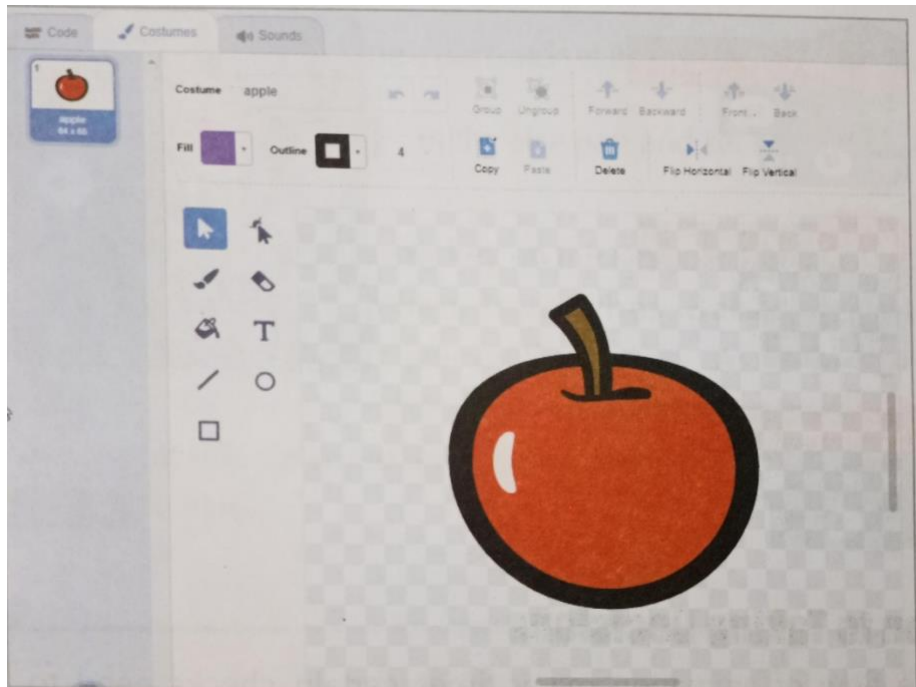

Programing Decisions

Most of the programs that we made in the 3rd quarter where linear. Meaning that there was only one possible way of a program running. The program runs and then we wait, watch, and then it finishes. Not the most exciting programs to be sure! Most times however, we want to have programs that behave differently in different situations. We want the programs to say *You win!* if you win the game or *Sorry, try again* if you lose.

What Are The Events Blocks In Scratch Programming?

Events are one of the ten block categories in Scratch and it is one of the most important sets of blocks. Events blocks are used to define the triggers when the script should run. All the other blocks will have no meaning till an event block is used to define when a script is to be run. These blocks are yellow in colour and are essentially used to run a script, making them important in any Scratch project.

There are a total of eight event blocks; six hat blocks and two stack blocks. Hat blocks are blocks that start a script when a specific event occurs, and stack blocks are rectangular-shaped blocks that are shaped to fit above and below other blocks. In Scratch 1.4, the event blocks were included under control blocks, and in Scratch 2.0 they were called "triggers". The name was changed to events blocks on Scratch Day 2012.
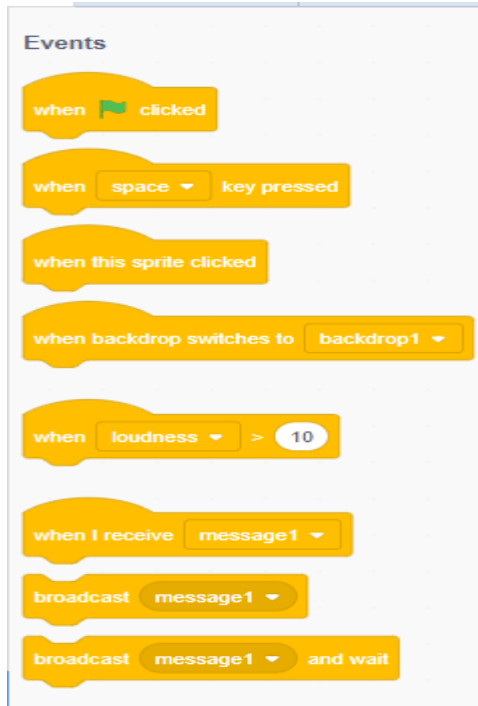
Let's look at some of the popular events blocks;

When the Green Flag Clicked Events Block

When this event block is put on top of a function, it will enable the script to run whenever the green flag is clicked. The green flag is located on the top left side, above the stage area. Without this block, the only way you can run your script is manually, meaning you will have to press a particular key or click on the sprite.
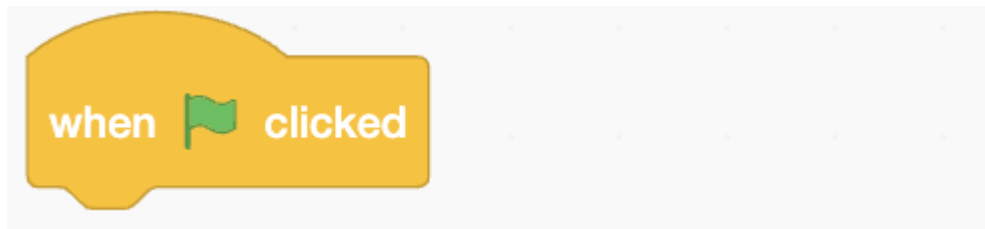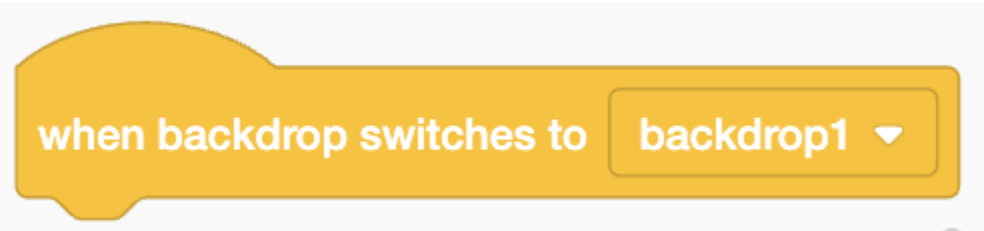

When the X Key is Pressed Events Block

Any script that is placed under this block will be activated when the specified key is pressed.
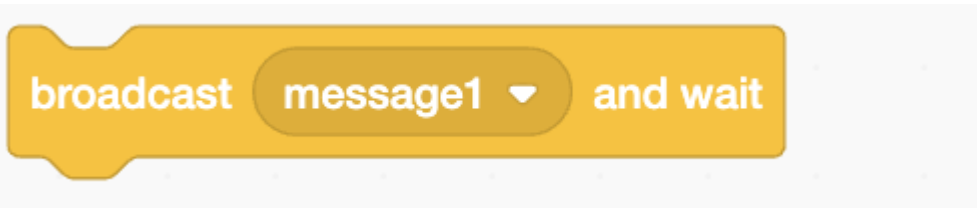
When the Backdrop Switches to Events Block
Scripts that are under this events block will be triggered when the specified backdrop is switched on the stage.

**Broadcast Message and Wait Events Block**
This event block will send a broadcast message through the Scratch project.
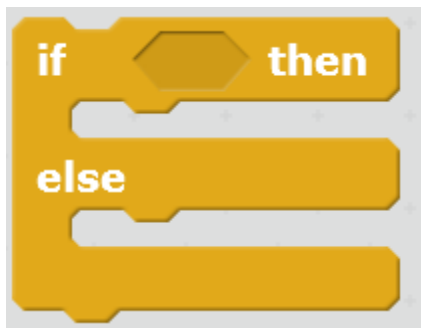

If Block

The if block is a decision structure that gives you the ability to specify whether a set of commands should (or should not) be executed based on the result of a test condition. If the condition in the block is true then the code inside the if part of the block are executed. if the condition is false, no code is executed.
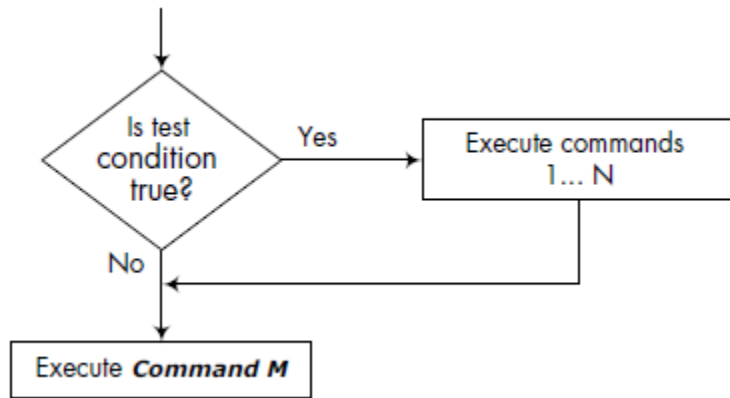
If/Else Block

The if /else block is a little different than the if block. The specified condition is tested at the top of the block. If the condition is true, the commands in the if part of the block are executed. If the condition is false,
however, the commands under else will execute instead. The program
will only execute one of the two groups of commands in the if/else block.