Knowledge Organiser: Scratch

What is Scratch?

Summary
Scratch is a visual programming language, designed for people who have never done any programming before. Its a very good tool to learn the basics of coding.

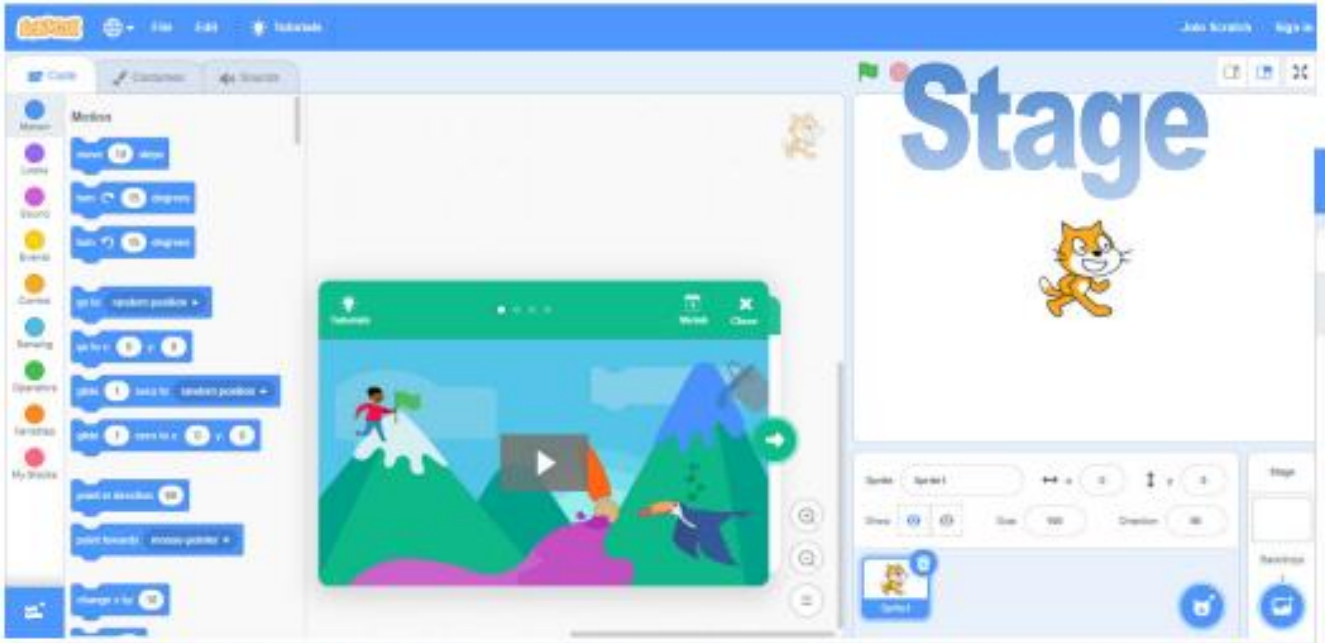
With Scratch, you can program your own interactive games, and animations. Scratch helps you to learn coding in a visual colour coded way and see how the blocks of coloured code fit together to make a working program. It also lets you learn about more complicated coding concepts such as iteration and selection in an accessible way.

Scratch is an online coding program—www.scratch.mit.edu used widely in the uk and usa to learn how to code.

Category	Notes
Motion	Moves sprites, changes angles and position
Looks	Controls the visuals of the sprite
Sound	Plays audio files and effects
Events	Event handlers
Control	Conditionals and loops etc.

Category	Notes
Sensing	Sprites can interact with the surroundings
Operators	Mathematical operators, comparisons
Variables	Variable and List usage and assignment
My Blocks	Custom procedures

Scratch User Interface



The Scratch interface has **three main sections: a *stage area*, *block palette*, and a coding area** to place and arrange the blocks into runnable scripts. Users may also create their own code blocks and they will appear in "My Blocks".

With a sprite selected at the bottom of the **staging area**, blocks of **commands** can be applied to it by dragging them from the block palette into the coding area. The Costumes tab allows users to change the look of the sprite in order to create various effects, including animation. The Sounds tab allows attaching sounds and music to a sprite.

The table above shows the categories of the programming **blocks:**

When creating sprites and backgrounds, users can draw their own **sprite** manually, choose a Sprite from a library, or upload an existing image.

There are **three tabs** to create your program on the coding area —Code, Costumes and Sounds

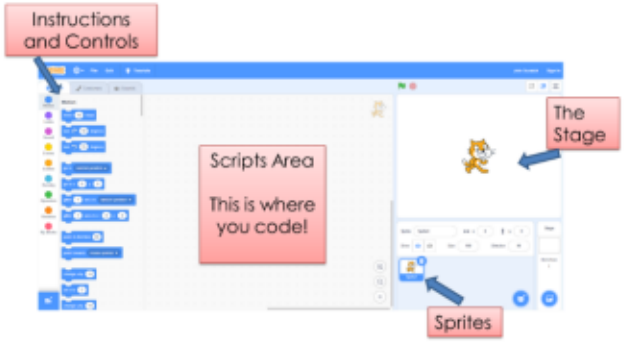
The example here is coding the **motion** of the sprite

KS3 Knowledge Organiser

Introduction to Programming in Scratch

The Scratch Interface

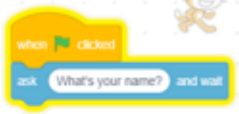
Instructions and Controls	This area contains various blocks of code, which allows you to piece together logic in order to code your programs
Scripts Area	This is the workspace upon which you drag and join the required blocks of code, to create the logic for your program
The Stage	This is the canvas on which your program will be displayed.
Sprites	Programmable objects. For example, if you are creating a game, your character would be a sprite.



Key Vocabulary

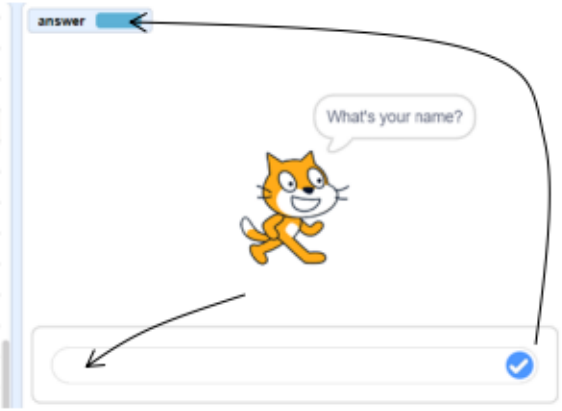
Key Word	*Definition*
Sprite	An object which can be programmed in Scratch
Block	A piece of programming code in Scratch
Inputs	Values which get sent from the user into the computer
Variables	The place where inputs get stored by the program (they represent memory locations)
Outputs	The values which get sent from the computer to the user
IF Statement	The logic used to program decisions in programs

Inputs



The ASK block is an input script. When it is run, it will pause the program and wait for the user to enter some text.

The input will be stored in a variable called 'answer'.



Variables

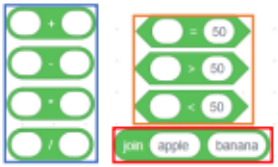
Variables represent locations in memory where data is stored.
We can create as many variables as we like when we program (we don't have to only use the ASK block).
We can therefore store as many inputs as we like, all while the program is running.

Variables are created in the orange 'variables' blocks section.

If we wish to add data to a variable, we use the 'Set' block.

Operators

The operator blocks allow us to perform calculations, see how data relates to each other and join text and variable contents together.
Below is an example of some of arithmetic operators, relational operators and also the concatenation (joining) operator.



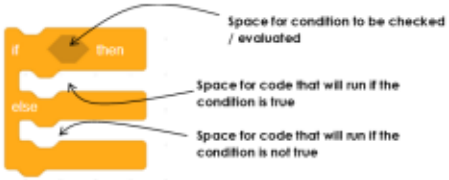
Outputs

The SAY block is an output script. When it is run, it will output whatever is contained in its contents box, far a given number of seconds.
We can also insert variables into the say script, so that the contents of variables can be outputted.
The JOIN operator can be used to join together the contents of variables with some text.

IF Statements

IF statement allows programs to take different pathways depending on conditions.

In Scratch, the IF block contains spaces for...
- a condition to be checked
- blocks to run if the condition is true
- blocks to run if the condition is false.



For more pathways, IF blocks can be placed inside other IF blocks.