Year 7 Unit 3 - PROGRAMMING ESSENTIALS 1

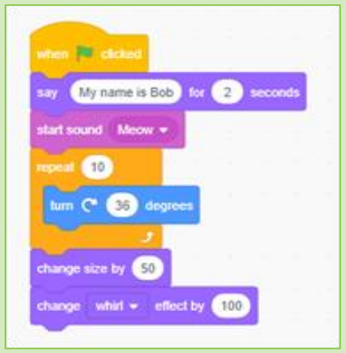
The 3-18 Education Trust

Algorithms

Algorithms

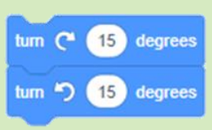
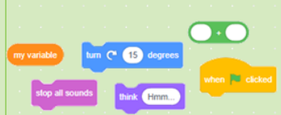
- An **algorithm** is a **sequence** of step-by-step **instructions** to solve a problem.
- Algorithms can be written in code, or be a **sequence** of pictures

A computer algorithm



Algorithm for making a sandwich

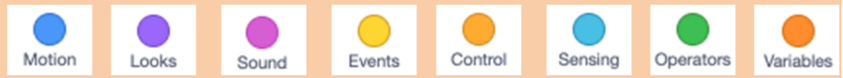
Scratch

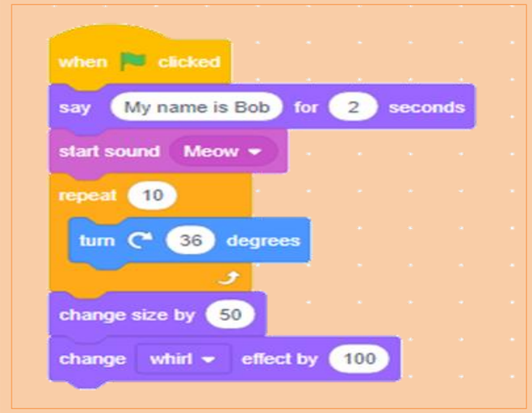
Word	Definition	Image
Sprite	The name of a **character** in Scratch	
Scratch	The name of the **programming language** we are learning	
Turn # # degrees	How far to the left or right you want to move your sprite. # is replaced with the number	
Block	A single instruction in our algorithm	

Key Terms

Instructions	detailed information about how something should be done or operated.
Execute	When you create a program for a computer, you give it a set of commands to execute.
Sequence	The order the instructions need to be in
Selection	Making choices
Iteration	Doing the same thing more than once **Iteration in computing is the process of repeatedly executing instructions**
Repeat	The block that makes and instruction happen more than once
Variables	**A variable is a name that refers to data being stored by the computer**
Subroutines	In computer **programming**, a **subroutine** is a sequence of program instructions that performs a specific task,
If block	- allows us to check a **condition** and perform an operation if the condition **evaluates** to 'true'.
Debugging	Finding errors in our code
Abstraction	Taking away all the information that isn't needed
Decomposition	Breaking down a problem
count-controlled	Count-controlled iteration will execute the commands a set number of times
condition-controlled	Condition-controlled will execute the commands until the condition you set is no longer being met

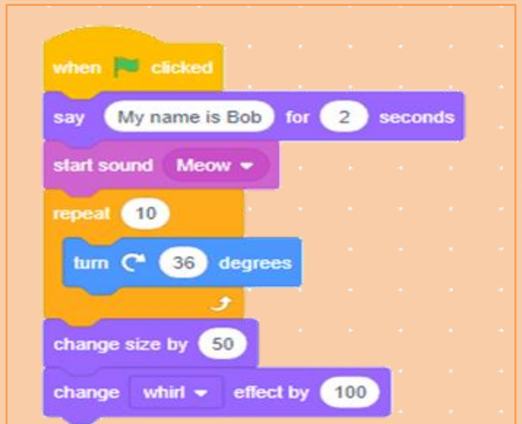
Scratch blocks and Programme examples





We can use **algorithmic prediction** to guess what will happen. My **Sprite** is going to get bigger!

The **repeat loop** in this example, will move ten times. This is **more efficient** than writing out ten **commands.**



The **turn # degrees block** will turn my sprite. This **algorithm** will turn my **sprite** in a circle