

Knowledge Organiser

Unit 5 – Programming in Scratch and Small Basic

Unit 5 – Scratch / Programming

Summary

Programming is writing computer code to create a program, in order to solve a problem. Programs consist of a series of instructions to tell a computer exactly what to do and how to do it.



Scratch is a visual programming language that allows you to create programs by allowing you to drag pre-built blocks of code / script.

A Sprite is an object or character in the game / animation. In order to give the impression of the sprite moving you can change the costume.



```
Turtle.Move(100)
Turtle.Turn(120)
Turtle.Move(100)
Turtle.Turn(120)
Turtle.Move(100)
```

Algorithm

An algorithm is a sequence of logical instructions for carrying out a task. In computing, algorithms are needed to design computer programs. .

Sequencing

Sequencing is the specific order in which instructions are performed in an algorithm.

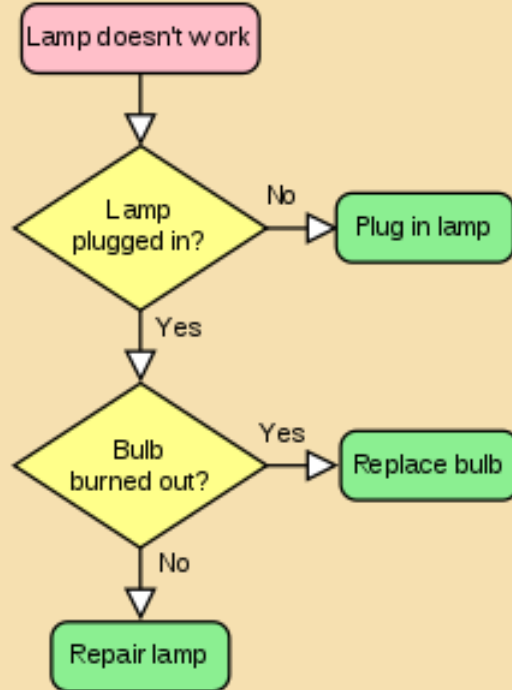
The code above will draw an equilateral triangle.

What do the blocks do?

Block	Explanation
	This piece of code will move the sprite 10 steps in the direction which is facing.
	This piece of code will turn the sprite 15 degrees to the right.
	This piece of code will turn the sprite 15 degrees to the left.
	This piece of code will swap the sprite to "costume2".
	This piece of code will trigger any attached pieces of code to action once the space key is pressed.
	When the program reached this piece of code. It will cause the program to pause for 1 second.
	This piece of code will loop anything inside of it 10 times.
	This piece of code will trigger all of the code inside once the condition has been met.
	This piece of code will change whatever the current value of the variable is to 0.

Flowcharts

Flowcharts are a type of algorithm that helps you plan your code. The flow chart uses specific symbols that allow a programmer to understand parts of their code. You follow the flow chart until you reach the relevant output.



This flow chart shows what to do if a lamp doesn't work.

It asks if the lamp is plugged in. If the answer is no, then you are told to plug in the lamp. If the answer is yes it asks if the bulb has burnt out. If the answer is yes, you are told to replace the bulb. If the answer is no, you are told to repair the lamp.

Loops

Loops are useful when programming because they stop code from being repeated.

Examples of loops:

```
1 for i = 1 to 3
2   turtle.move(100)
3   turtle.turn(120)
4 EndFor
```

This code will draw a triangle, as the loop will count from 1 to 3 and run the code 3 times.

```
1 for i = 1 to 360
2   turtle.move(1)
3   turtle.turn(1)
4 EndFor
```

This code will draw a circle, as the loop will count from 1 to 360 and run the code 360 times.

```
1 for i = 1 to 5
2   turtle.move(100)
3   turtle.turn(72)
4 EndFor
```

This code will draw a pentagon, as the loop will count from 1 to 5 and run the code 5 times.