<u>Year 5 – Algorithms and Programming (Coding)</u>

Element 1 – Coding

Coding is used everywhere in the modern world and probably helps us with many of our daily tasks and routines – some of which we may not even realise use coding. Code is quite simply the language that a computer speaks in order for it to carry out specific tasks or instructions.

Coding on computers can be done using a variety of programs such as:

- Logo
- Scratch
- Blockly
- Python
- Kodu

In school, we mainly use the 2Code program on Purple Mash.

What is an algorithm?

This is basically a sequence of instructions or a set of rules that are followed to complete a task. For example, to make yourself a drink you have to follow a sequence of steps in the right order. If you do something in the wrong order you might end up making a mess! Just think if you forget to get the cup out!

This is why algorithms in computing have to be done using programming language (coding) in order for them to be understood. A real life example of this is traffic lights – if these were not coded correctly, there would be a lot of car accidents and confusion at the lights.

What KEY VOCABULARY do we use in coding?

In Year 5, you will use these key vocabulary terms below:

Action
Types of commands, which are run on an object. They could be used to move an object or change a property.

Alert
This is a type of output. It shows a pop-up of text on the screen.

Abstraction
A way of de-cluttering and removing unnecessary details to get a program functioning.

Bug
A problem in a computer program that stops it working the way it was designed.

Concatenation
The action of linking things together in a series.

Command
A single instruction in a computer program.

Control
These commands determine whether parts of the program will run, how often and sometimes, when.

Debug/Debugging
Looking for any problems in the code, fixing and testing them.

Design Mode
Used to create the look of a 2Code computer program when it is run.

Event
Something that causes a block of code to be run.

Decomposition
A method of breaking down a task into manageable components. This makes it easier as the components can be then be coded seperately and then brought back together.

If
A conditional command. This tests a statement. If the condition is true, then the commands inside the block will be run.

Function
A block or sequence of code that you can access when you need it, so you don't have to rewrite the code repeat it. Instead you simple 'call' the function each time you want it.

Get Input
This puts the text that a user types into the computer's temporary memory to be used to control the program flow.

Object
An element in a computer program that can be changed using actions or properties.

If/Else
A conditional command. This tests a statement. If the condition is true, then the commands inside the 'if block' will be run. If the condition is not met, then the commands inside the 'else block' are run.

Input
Information going into the computer. Can include moving or clicking the mouse, using the keyboard, swiping and tilting the device.

Physical System
A system or process which happen in the real world using robotics, sensors or motors e.g. traffic lights.

Output
Information that comes out of the computer e.g. sound.

Repeat
This command can be used to make a block of commands run a set number of times or forever.

Simulation
A model that represents a real or imaginary situation.

Selection
This is a conditional/decision command. When selection is used, a program will choose a different outcome depending on a condition.

Sequence
This is when a computer program runs commands in order. In 2Code this can also include "repeat" or a timer.

String
A sequence of characters, which could form words, phrases or even whole sentences.

Timer
Use this command to run a block of commands after a timed delay or at regular intervals.

Variable
A named area in computer memory. A variable has a name and a value. The program can change this variable value.

Element 1 – Closed Test

1) Name 3 different programs you can code on.
2) What is an algorithm?
3) What might happen if an algorithm is not written correctly?
4) What does 'string' mean in coding?
5) What does 'event' mean in coding?

Element 2

Can you use one of the 'Free Code' options on Purple Mash to create an algorithm/program that shows traffic lights changing? When you complete it, save it/hand it in for your teacher to check.

OR,

Use a different coding program, such as Scratch, to show you can program and debug without given instructions.