Year 4 – Algorithms and Programming (Coding)

Element 1 – Coding

The language of computers – Coding. Imagine if your parents started to speak to you in a language you didn't understand, or missed out words – it would be very difficult to do what they had asked as you would not have heard the full set of instructions. This is what happens when coding is not done correctly – computers and electronic devices would not be able to do their jobs correctly if they did not have the full set of instructions that they understood. How frustrating would it be if the button on your games controller did not do what you wanted it to?

The Process of Coding:

In order for the coding process to be successful, these stages have to be followed:

- Design: Create a design for what it is you are wanting to create. This could be a flowchart, a labelled diagram or a storyboard. This helps you think through the steps (algorithm) needed.
- Code: Create the steps (algorithm) and adapt your design if needed.
- Test and Debug: See if the program works and fix any errors.

The 'Test and Debug' part of the process is really important as you need to make sure it works before it is used by others (Would you want a lift that took you down instead of up?)

What KEY VOCABULARY do we use in coding?

In Year 4, 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.

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

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

Flowchart
A diagram which represents an algorithm.

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.

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

Repeat Until
This command can be used to make a block of commands run until something certain happens.

Sequence
When a computer program runs commands in order.

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

Code Design
A process of designing what your program will look like and what it will do.

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

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

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

Nesting
When you write a command inside something else e.g. a block of commands could be nested inside a timer.

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

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

Algorithm
A precise step by step set of instructions used to solve a problem or achieve an objective.

Co-ordinates
Numbers which determine the position of a point, shape or object in a particular space.

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

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

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

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

Prompt
A question or request asked in coding to obtain information from the user in order to select which code to run.

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) What might happen to make it difficult for a computer or electronic device to do their job properly?
2) Name the 3 stages of the process of coding.
3) Why is the 'Test and Debug' stage probably the most important?
4) What is an 'algorithm' in coding?
5) What does 'variable' mean in coding?

Element 2

Can you design a piece of coding (this can be however you would like to present it) which you can then use the 'Free Code' section of Purple Mash to create. You could try and create one that shows a lift going up and down correctly, or it could simply be making a character move across the screen.

Remember to save it and hand it in to your teacher on Purple Mash!