

## Key Learning

To use the program design process, including flowcharts, to develop algorithms for more complex programs using and understanding of abstraction and decomposition to define the important aspects of the program.

To code, test and debug from these designs.

To use functions and tabs in 2Code to improve the quality of the code.

To code user interactivity using input functions.

## Previous learning

- A timer is a variable and set it to the starting number of seconds. A timer command repeats and subtracts 1 every second. Adding a text object in design view will display this number.
- A variable will store the score, each time the user gains a point, it will change and display the value of the variable.
- A program shows how objects behave as they would in the real world. For example, a football program that uses angles, speed and friction to simulate kicking a football.
- When simulating a physical system, you first must break the system down into parts that can be coded (decomposition). The different parts will come together to make the full simulation.

## Key Vocabulary

**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.

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

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

**Code Design** – Design what a program will look like and what it will do.

**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.

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

**Function** – A type of procedure or routine.

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

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

**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.

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

**Object** - An element in a computer program that can be changed using actions or properties. In 2Code, buttons, characters and vehicles are types of objects.

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

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

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

**Simulation** - A model that represents a real or imaginary situation.

**Tabs** – Allows you to move between blocks of code on different pages

**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.

## Sticky knowledge

- Tabs are used to organise you code and make it more readable. This also makes it easier to debug. Give the Tabs useful names to help with this.
- A function is a block of code that you can access when you need it, so you don't have to rewrite the same block repeatedly. You call the function each time you want it. In a turtle program you could have a button that will make the turtle draw a square each time you click it. In the text adventure, there were functions for each room that were called when the user navigated to the room.
- When the user clicks on an object, when the user presses keys or swipes the screen with the mouse, the 'Get Input' and 'Prompt for input' commands. On a touchscreen: when the screen is touched or swiped.

## Characteristics needed for this topic:

- Concentration
- Questioning
- Curiosity

## Aspirations

- Statistics
- Data scientist
- Software developer