

What should I already know?

- Introducing block coding. Objects and actions. Events (Click event, sound output). Executing a program. Design view: Planning.
- Algorithms. Logical decision making. Sequencing instructions. Following instructions.
- Coding a 'turtle'. Creating programs using sequencing and repeat. Visual use of the Logo programming language. Program logic and structure.
- Algorithms. Collision detection. Timers. Object types. Buttons. Debugging.
- Logical decision processing. Forward planning to achieve a solution.
- Flowcharts. Timers. Repeat. Code, test, debug process.
- Logical decision processing. Modelling selection on a binary model.
- Code, test, debug process. IF statements. Repeat Until and IF/ELSE Statements. Number Variables.
- Text-based coding. Utilize understanding of coding structures.
- Sequencing and animation in logical steps.
- Use of 2Dos, saving, opening and editing work, sharing work, copying and pasting, mouse, keyboard and device skills.

What will I know by the end of the unit?

How do I create a playable game?

- You will use simplified code to make their programming more efficient.
- You will use variables in their code.
- You will create a simple playable game.

How do I program a simulation using 2Code?

- You will plan an algorithm modelling the sequence of traffic lights.
- You will select the right images to reflect the simulation they are making.
- You will use their plan to program the simulation to work in 2Code.

How do I use decomposition to make a plan of a real-life situation?

- You will make good attempts to break down their task into smaller achievable steps.
- You will recognise the need to start coding at a basic level of abstraction to remove superfluous details from their program that do not contribute to the aim of the task.

What is a function and how do functions work in code?

- You will create a program which represents a physical system.
- You will create and use functions in their code to make their programming more efficient.

How do I create a string?

- You will create and use strings in programming.
- You will set/change variable values appropriately.
- You will know some ways that text variables can be used in coding.

What is concatenation and how does it work?

- Children can create a string and use it in their program.
- Children can use strings to produce a range of outputs in their program.

Key Vocabulary

- **Abstraction** A way of de-cluttering and removing unnecessary details to get a program functioning.
- **Algorithm** A precise step by step set of instructions used to solve a problem or achieve an objective.
- **Concatenation** The action of linking a mixture of strings, variable values and numbers together in a series.
- **Efficient** In coding, simplified code runs faster and uses less processing memory, it is said to be more efficient.
- **Action** The way that objects change when programmed to do so. For example, move or change a property.
- **Debug\ Debugging** Fixing code that has errors so that the code will run the way it was designed.
- **Flowchart** A diagram that uses specifically shaped, labelled boxes and arrows to represent an algorithm as a diagram.
- **Decomposition** A method of breaking down a task into manageable components. This makes coding easier as the components can then be coded separately and then brought back together in the program.
- **Event** An occurrence that causes a block of code to be run. The event could be the result of user action such as the user pressing a key or clicking or swiping the screen or when objects interact.
- **Function** A block or sequence of code that you can access when you need it, so you don't have to rewrite the code repeatedly. Instead, you simply call the function each time you want it.
- **Nesting** When coding commands are put inside other commands. These commands only run when the outer command runs.
- **Object Items** in a program that can be given instructions to move or change in some way.
- **Repeat** This command can be used to make a block of commands run a set number of times, until a condition is met or forever.
- **Selection** A conditional decision command. When selection is used, a program will choose which bit of code to run depending on a condition.
- **Input Information** going into the computer. This could be the user moving or clicking the mouse, or the user entering characters on the keyboard.
- **Physical System** In this context, this is any object or situation that can be analysed and modelled.
- **Properties** These determine the look and size of an object.
- **Sequence** This is when a computer program runs commands in order.
- **Simplify** In coding this is used to describe modifying the code to complete the same process with less lines of code.
- **Output Information** that comes out of the computer e.g. sound, prompt, alert or print to screen.
- **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. Variables are used in programming to keep track of things that can change while a program is running.

Key Questions

- **What does simulating a physical system mean?**  
Creating a program where the 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.
- **Describe how you would use variables to make a timer countdown and a scorepad for a game.**  
Timer countdown: Create a timer variable and set it to the starting number of seconds. Add a Timer command that repeats and subtracts 1 every second. Add a text object in design view to display this number. Score: Create a variable to store the score, each time the user gains a point, change and display the value of the variable.
- **Give examples of how you could use the Launch command in 2Code.**  
Clicking on a button or other object in the program to opens another 2Code program or a webpage.
- **What do the terms decomposition and abstraction mean?**  
Use examples to explain them. Decomposition is breaking a task into its component parts so that each part can be coded separately. If you were coding a game of chess, you could decompose into the moves of the different pieces and the setup of the playing space. Abstraction is removing unnecessary details to get the program functioning. In the example, the colour and size of the squares is not important to game play.

Design    Exit Design    Add a new Tab to your code    change variable

Open design mode in 2Code.    Switch to code mode in 2Code.    Add a new Tab to your code    A change variable block.

print to screen MyName!    random word    with the dog    create variable

Example of combining variables and strings to print to the screen    Creating a variable in 2Code

create function myFunction1    myCar1 angle set to 90    call myFunction1

Creating a function in 2Code    Calling a function in 2Code

Purple Mash Resources

- Tools
- 2Dos
- 2Chart
- Free Code Gorilla

