# Unit: 4.1
## Coding

## Key Learning

- To begin to understand selection in computer programming.
- To understand how an IF statement works.
- To understand how to use co-ordinates in computer programming.
- To understand the 'repeat until' command.
- To understand how an IF/ELSE statement works.
- To understand what a variable is in programming.
- To use a number variable.
- To create a playable game.

## Key Resources

purple mash
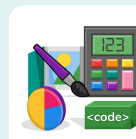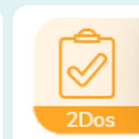
Tools   2Dos   2Chart   Free code gibbon

## Key Vocabulary

### Action
The way that objects change when programmed to do so. For example, move.

### 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.

### Background
In 2Code the background is an image in the design that does not change.

### Button
A type of object that responds to being clicked on.

### Code blocks
A way to write code using blocks which each have an object or an action.

### Command
A single instruction in 2Code.

### Debug/Debugging
Fixing code that has errors so that the code will run the way it was designed to.

### Design
In coding, this is a plan for the program showing the visual look of the user interface (the screen) with the objects. The algorithm can be represented as part of the design, showing actions and events.

### Execute
This is the proper word for when you run the code. We say, 'the program (or code) executes.'

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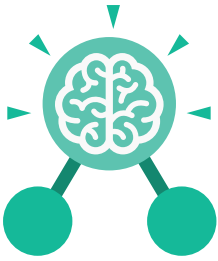
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## Key Vocabulary

### 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 (when Key) or clicking or swiping the screen (when Clicked, when Swiped). In 2Code, the event commands are used to create blocks of code that are run when events happen.

### Nest
When coding commands are put inside other commands. These commands only run when the outer command runs.

### Implement
When a design is turned into a program using coding.

### Repeat until
In 2Code this command will repeat a block of commands until a condition is met.

### Flowchart
A diagram that uses specifically shaped, labelled boxes and arrows to represent an algorithm as a diagram.

### 'If/Else' Statement
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.

### Object
Items in a program that can be given instructions to move or change in some way (action). In 2Code Gibbon, these include character, turtle, button, vehicle, animal, food, shape, number, input and label.

### Predict
Use your understanding of a situation to say what will happen in the future or will be a consequence of something.

### 'If' Statement
A computer uses an IF statement to decide which bit of code to run. IF a condition is true, then the commands inside the block will be run.

### Input
Information going into the computer. This could be the user moving or clicking the mouse, or the user entering characters on the keyboard. On tablets there are other forms such as finger swipes, touch gestures and tilting the device.
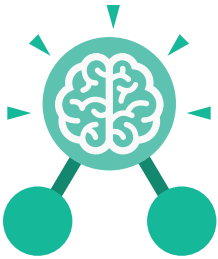
### Prompt
A question or request asked in coding to obtain information from the user in order to select which code to run.

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

### Run
Clicking the Play button to make the computer respond to the code.

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## Key Vocabulary

### Properties
These determine the look and size of an object. Each object has properties such as the image, scale and position of the object.

### Timer
In coding, use a timer command to run a block of commands after a timed delay or at regular intervals.

### Selection
Selection is a decision command. When selection is used, a program will choose which bit of code to run depending on a condition.

### Sequence
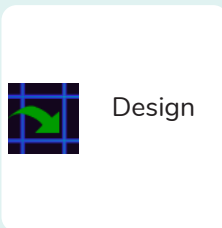This is when a computer program runs commands in order.

### 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.
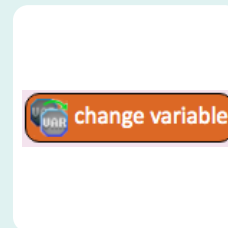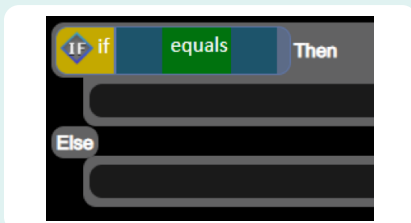
## Key Images


Design
Open design mode in 2Code.


Exit Design
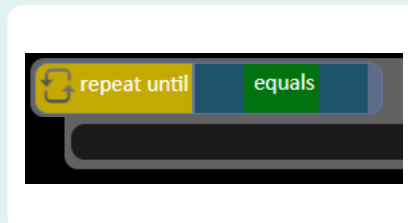Switch to code mode in 2Code.
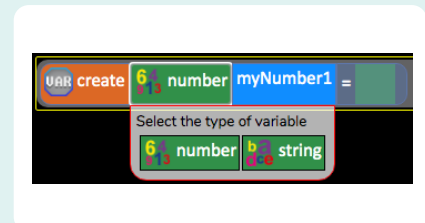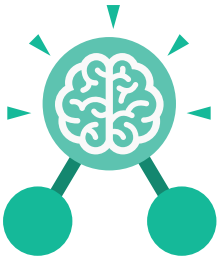

change variable
A change variable block.


An 'if/Else' command.


Repeat until.


Creating a variable in 2Code.

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## Key Questions

### Explain the stages of the design, code, test, debug coding process.

This is a process to go through as you create a program using coding

- Design: create a design which could be a flowchart, a labelled diagram or a storyboard. This helps to think through the algorithms required
- Code: code the algorithms using to code and adapting the design.
- Test and Debug: see if the program works and fix any errors.

### How can variables and if/else statements be useful when coding programs with selection?

The variable could be set either to 0 or 1 and this could be changed by user action or a timer. If/else statement outcomes could depend upon the value of the variable. command for selection.

### What does selection mean in coding and how can you achieve this in 2Code?

The code will contain commands that require a decision and the next code to run will depend upon the outcome of this decision. In 2Code we used the 'if' command for selection.

### What is the difference between the different object types in 2Code Gibbon level?

The different objects have different properties. This makes then suitable for different type of programs.

- Buttons can only be clicked and have their colour and text changed.
- Vehicles have speed and angle.
- Characters have movement in 4 directions.
- Turtles have rotation, pen up and down.

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