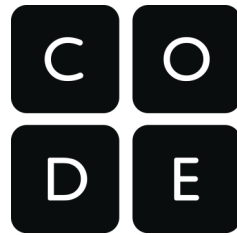




## What I should already know:

- ◆ To have used a coding game on a tablet or computer (from previous unit of work)
- ◆ To know that instructions tell people or machines to complete an action



## By the end of this unit:

- Children will know that individual commands will result in an action completed by a bot
- Children will be able to use basic symbols to record directional instruction
- Children will use a developing range of language and styles of control
- Children will be able to debug simple errors in code

## Key Information:

Children will use two main applications to develop their coding: 2code and code studio

They will begin by giving very simple, single instructions to establish an outcome. They will then complete simple challenges to introduce 'debugging'

There will be practical activities as they explore algorithms as instructions and directions.

## Links (Websites/Apps):

|                    |                |                |
|--------------------|----------------|----------------|
| 2code (purplemash) | Alex the robot | Code-a-pillar  |
| Box Island         | Blue bot       | Scratch junior |
| Code studio        |                |                |

## Vocabulary

|                    |   |
|--------------------|---|
| <b>direction</b>   | Choosing the way in which something will    |
| <b>instruction</b> | Telling something what to do                |
| <b>map</b>         | The background the computer robot is        |
| <b>navigate</b>    | Plan the route you will take and sometimes  |
| <b>sequence</b>    | A collection of instructions in order       |
| <b>speed</b>       | How fast or slow the computer robot will be |

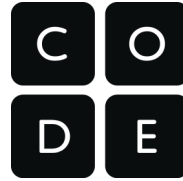
## Fundamental Vocabulary

|                    |  |
|--------------------|--|
| <b>algorithm</b>   | A precise step by step set of instructions used to solve a problem or achieve an objective |
| <b>debug</b>       | Looking for any problems in the code, fixing and testing them.                             |
| <b>command</b>     | A single instruction in a computer program   |
| <b>control</b>     | Decide the behaviour of something on the   |
| <b>programming</b> | The process of writing code on a computer  |



## What I should already know:

- ◆ How to use simple code to control a bot online or floor robot
- ◆ To have explored debugging simple codes



## By the end of this unit:

- Children will be able to control devices that contain numerical data (e.g move 2 steps)
- Children will be able to predict a sequence of instructions
- Children will be able to program a bot using repeats and simple conditional commands

## Key Information:

Children will be introduced to new coding platforms including elchavo, scratch junior and scratch. They will still use apps such as 2code, code studio and box island

They will investigate computational concepts without a computer. The children will develop skills and a knowledge of sequencing, problem solving (debugging) and the repeat until command.

## Links (Websites/Apps):

|                    |             |                |
|--------------------|-------------|----------------|
| 2code (purplemash) | EIChavo     | Hello Ruby     |
| Box Island         | Code studio | Scratch junior |

## Vocabulary

|                  |  |
|------------------|--|
| <b>direction</b> | Choosing the way in which something will travel  |
| <b>loop</b>      | a loop is a sequence of instructions that is continually repeated until a certain condition is reached |
| <b>repeat</b>    | Do something again that has been written in the code   |
| <b>random</b>    | A surprise such as an undecided number between two chosen numbers                                      |
| <b>sequence</b>  | A collection of instructions in order  |
| <b>speed</b>     | How fast or slow the computer robot will be moving   |
| <b>variable</b>  | a variable is a value that can change, depending on conditions or on information passed to the program |

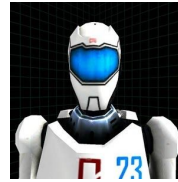
## Fundamental Vocabulary

|                    |   |
|--------------------|---|
| <b>algorithm</b>   | A precise step by step set of instructions used to solve a problem or achieve an objective              |
| <b>debug</b>       | Looking for any problems in the code, fixing and testing them.  |
| <b>command</b>     | A single instruction in a computer program  |
| <b>conditions</b>  | Code that is added to an algorithm and is dependent on particular factors being met such as if and when |
| <b>control</b>     | Decide the behaviour of something on the computer using code  |
| <b>programming</b> | The process of writing code on a computer   |
| <b>sprite</b>      | The term used to describe the computer robot within some programming software such as scratch           |



### What I should already know:

- ◆ How to predict actions from the sequence in the code written
- ◆ How to use the repeat until block and how this affects the code



### By the end of this unit:

- Children will be able to use conditional statements (if and when commands) within a sequence of code
- Children will sequence a list of commands to produce a pre-drawn shape or make a robot follow a defined route
- Children will use the 'wait' command within a program
- Children will understand that robots and on-screen characters share a common language

### Key Information:

Children will continue to use familiar apps such as code studio, elchavo and alex the robot.

They will learn how to program more efficiently using the repeat block

The children will have more experience when using conditional statements.

They will continue to problem solve and debug existing challenges as well as debugging their own errors.

### Links (Websites/Apps):

|                |             |                |
|----------------|-------------|----------------|
| Lightbot       | EIChavo     | Scratch        |
| Alex the Robot | Code studio | Scratch junior |

### Vocabulary

|                            |  |
|----------------------------|--|
| <b>On-screen character</b> | The thing on the screen that you writing code for  |
| <b>Repeat until</b>        | Keep repeating a section of code until you meet the given command  |
| <b>robot</b>               | a machine capable of carrying out a complex series of actions automatically, especially one programmable by a computer |
| <b>route</b>               | The way in which something will travel from its starting point to the end point  |
| <b>wait</b>                | To pause the code for a set time and then continue   |

### Fundamental Vocabulary

|                    |   |
|--------------------|---|
| <b>algorithm</b>   | A precise step by step set of instructions used to solve a problem or achieve an objective              |
| <b>debug</b>       | Looking for any problems in the code, fixing and testing them.  |
| <b>command</b>     | A single instruction in a computer program  |
| <b>conditions</b>  | Code that is added to an algorithm and is dependent on particular factors being met such as if and when |
| <b>loop</b>        | a loop is a sequence of instruction s that is continually repeated until a certain condition is reached |
| <b>repeat</b>      | Do something again that has been written in the code  |
| <b>programming</b> | The process of writing code on a computer   |
| <b>sprite</b>      | The term used to describe the computer robot within some programming software such as scratch           |
| <b>variable</b>    | a variable is a value that can change, depending on conditions or on information passed to the program  |



## What I should already know:

- ◆ How to predict actions from the sequence in the code written
- ◆ How to use the repeat block and how this affects the code
- ◆ How conditionals such as if and when affect the code



## By the end of this unit:

- Children will be able to use a greater range of conditional statements (whilst, if else,) within a sequence of code
- Children will understand that real-world devices such as traffic lights or washing machines are controlled using computer programs
- Children will predict events in a greater sequence of instructions
- Children will use and change a pre-written procedure
- Children will be able to use external sensors or inputs as part of a linear program (on mouse click, when sound level is greater)

## Key Information:

Children will continue to use familiar apps such as code studio, elchavo and scratch junior and lego mindstorms.

They will learn how to program more efficiently using the repeat until block

The children will have more experience when using conditional statements.

They will continue to problem solve and debug existing challenges as well as debugging their own errors.

## Links (Websites/Apps):

|                 |             |                |
|-----------------|-------------|----------------|
| Lightbot        | EIChavo     | Scratch        |
| Lego Mindstorms | Code studio | Scratch junior |

## Vocabulary

|                           |   |
|---------------------------|---|
| <b>If else</b>            | If the condition is true do the first command if it is  |
| <b>Repeat until</b>       | Keep repeating a section of code until you meet the   |
| <b>Real-world devices</b> | Machines that we encounter in our every day lives that are programed by computer code such as traffic |
| <b>whilst</b>             | While a condition is true continue to follow the  |

## Fundamental Vocabulary

|                    |   |
|--------------------|---|
| <b>algorithm</b>   | A precise step by step set of instructions used to solve a problem or achieve an objective              |
| <b>debug</b>       | Looking for any problems in the code, fixing and testing them.  |
| <b>command</b>     | A single instruction in a computer program  |
| <b>conditions</b>  | Code that is added to an algorithm and is dependent on particular factors being met such as if and when |
| <b>loop</b>        | a loop is a sequence of instruction s that is continually repeated until a certain condition is reached |
| <b>repeat</b>      | Do something again that has been written in the code  |
| <b>programming</b> | The process of writing code on a computer   |
| <b>sprite</b>      | The term used to describe the computer robot within some programming software such as scratch           |
| <b>variable</b>    | a variable is a value that can change, depending on conditions or on information passed to the program  |



## What I should already know:

- ◆ How to predict actions in a greater sequence of code
- ◆ How to use the repeat until block and how this makes the code more efficient
- ◆ How conditionals such as if, when, if else or whilst affect the code



## By the end of this unit:

- Children will be able to understand what variables are in real life and be able to create them within a computer program to store and retrieve data
- Children will think logically that when x happens y is the result and show this using code
- Children will use 'say' commands to give information
- Children will test and debug regularly
- Children will use 'and', 'or' and 'not' blocks to change responses and understand what they do
- Children will know when to use repeat, repeat until and forever if loops to make programs shorter and more efficient

## Key Information:

Children will continue to use familiar apps such as code studio, elchavo, scratch junior and lego mindstorms. They will be introduced to the new app blockly which uses variables and can link to small robots dot and dash.

Using everything that has gone before they should be thinking more logically, predicting longer sequences and using conditional blocks to make their code increasingly more efficient.

## Links (Websites/Apps):

|                 |             |           |
|-----------------|-------------|-----------|
| Lightbot        | Blockly     | Scratch   |
| Lego Mindstorms | Code studio | Hopscotch |

## Vocabulary

|                     |   |
|---------------------|---|
| <b>events</b>       | Something that causes a block of code to be run                                   |
| <b>Forever if</b>   | If the condition is true then keep repeating the code until it is untrue          |
| <b>logically</b>    | Use good reasoning to predict what will happen and why                            |
| <b>Repeat until</b> | Keep repeating a section of code until you meet the given command                 |
| <b>responses</b>    | How the robot or program reacts to the code                                       |
| <b>say</b>          | To make you on-screen character talk by using a speech bubble or recorded message |

## Fundamental Vocabulary

|                    |   |
|--------------------|---|
| <b>algorithm</b>   | A precise step by step set of instructions used to solve a problem or achieve an objective              |
| <b>debug</b>       | Looking for any problems in the code, fixing and testing them.  |
| <b>command</b>     | A single instruction in a computer program  |
| <b>conditions</b>  | Code that is added to an algorithm and is dependent on particular factors being met such as if and when |
| <b>loop</b>        | a loop is a sequence of instructions that is continually repeated until a certain condition is reached  |
| <b>repeat</b>      | Do something again that has been written in the code  |
| <b>programming</b> | The process of writing code on a computer   |
| <b>sprite</b>      | The term used to describe the computer robot within some programming software such as scratch           |
| <b>variable</b>    | a variable is a value that can change, depending on conditions or on information passed to the program  |





## What I should already know:

- ◆ How to think logically using code
- ◆ How to make their code increasingly more efficient
- ◆ How conditionals such as if, when, if else or whilst affect the code
- ◆ Use variables within their code
- ◆ Test and debug regularly



## By the end of this unit:

- Children will be able to explain what happens when more than one variable is changed
- Children will have a simple understanding of text based programming language (python)
- Children will investigate more advanced loops and procedures
- Children will use coordinates within a grid within their code
- Children will consolidate the coding skills they have learnt throughout KS2

## Key Information:

Children will use a variety of apps and websites to consolidate their coding skills.

They should leave SMAAA knowing how to code efficiently using advanced loops and procedures.

Children should demonstrate that they can test and debug their own code.

## Vocabulary

|                    |   |
|--------------------|---|
| <b>coordinates</b> | A set of values that show an exact position. On graphs it is usually a <b>pair of numbers</b> : the first number shows the distance along, and the second number shows the distance up or down. |
| <b>events</b>      | Something that causes a block of code to be run   |
| <b>Forever if</b>  | If the condition is true then keep repeating the code until it is untrue  |
| <b>logically</b>   | Use good reasoning to predict what will happen and why  |
| <b>python</b>      | <b>Python</b> is an interpreted, high-level, general-purpose programming language.  |

## Fundamental Vocabulary

|                    |   |
|--------------------|---|
| <b>algorithm</b>   | A precise step by step set of instructions used to solve a problem or achieve an objective              |
| <b>debug</b>       | Looking for any problems in the code, fixing and testing them.  |
| <b>command</b>     | A single instruction in a computer program  |
| <b>conditions</b>  | Code that is added to an algorithm and is dependent on particular factors being met such as if and when |
| <b>loop</b>        | a loop is a sequence of instructions that is continually repeated until a certain condition is reached  |
| <b>repeat</b>      | Do something again that has been written in the code  |
| <b>programming</b> | The process of writing code on a computer   |
| <b>sprite</b>      | The term used to describe the computer robot within some programming software such as scratch           |
| <b>variable</b>    | a variable is a value that can change, depending on conditions or on information passed to the program  |

## Links (Websites/Apps):

- |                 |             |           |
|-----------------|-------------|-----------|
| Lightbot        | Blockly     | Scratch   |
| Lego Mindstorms | Code studio | Hopscotch |