

# **iProgram**

## **Knowledge Organisers**

# iProgram: rProgram EYFS

## Course Evaluation Criteria

**Reception: We would expect all children in reception to attain statements 1-5. If statements 6 or 7 are attained, those pupils are exceeding expectations.**

1. Pupils can name two parts of a computer.
2. Pupils can recognise different types of technology at home and at school.
3. Pupils understand what problem solving is.
4. Pupils know that instructions need to be clear so people can understand them.
5. Pupils know what technology is.
6. Pupils can name one way computers have changed since being invented.
7. Pupils can identify different pieces of technology and the purposes they serve.

## Course Outcomes

**Course overview:** Throughout the rProgram course the class will start to learn what coding is. They will look at different technology throughout the home and in other environments and discuss their uses. Through looking at different technology they will start to understand how and why things work the way they do.

**Learning objective for the course:** Throughout rProgram pupils will learn how to code. They will start off very simply by building pathways like a jigsaw, so a character knows where to go. Pupils will then move on to more complex coding and look at using arrows rather than building blocks. The pupils will learn five different parts of a computer and be asked to design their own. Throughout the course pupils will learn about technology and how this may look within school and at home. Pupils will learn what different technology is used for and why it is all so vital in our day-to-day life. Finally, the pupils will learn about clarity. Instructions when coding need to be clear and simple; this skill will be practised as a class and on the apps.

## Technology



Phones



Laptops



iPads & Tablets



Computers

## Apps Used



**Coding Safari**



**Tynker Jr.**



**Amazing Escapes**



**Code-a-pillar**



**Code Karts**

## Vocabulary Bank

**Technology**

*Anything that has been invented by a human that can make life easier or solve a problem.*

**Computer**

*An electronic machine that follows instructions.*

**Machine**

*Machines are used in lots of different places, and come in lots of different sizes.*

**Repeat**

*Instructions that happen more than once.*

**Instructions**

*Information about how something should be done and what to do.*

**Programming**

*When we tell a computer or a machine an instruction to complete.*

# iProgram: iCode Lite Level 1

## Course Evaluation Criteria

**Y1: We would expect all children in Y1 to attain statements 1-6. If any of statements 7-10 are attained, those pupils are exceeding expectations.**

1. Pupils know what a computer is and what it is used for.
2. Pupils know that instructions are also known as algorithms.
3. Pupils understand that computers aren't capable of thought.
4. Pupils know what functions do to our code.
5. Pupils can write algorithms to achieve certain goals.
6. Pupils understand that algorithms should be as short as possible.
7. Pupils can use repeats to make their algorithms shorter.
8. Pupils know that algorithms can be used to solve problems.
9. Pupils can find errors and debug their own work.
10. Pupils can use the word conditionals properly.

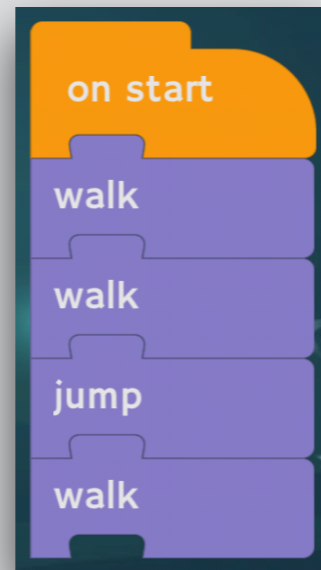
## Course Evaluation Criteria

**Course overview:** Students will use games to learn key coding skills. The sessions will start by looking at everyday tasks and thinking about the thought behind a series of problems within the app 'Kodable'. This will culminate in students learning how to use the coding language 'Blockly', the app 'Hopscotch' and using the word algorithm with ease.

**Learning Outcome for the course:** To learn to program simple shapes on the app Hopscotch. To understand how to write in steps and be able to demonstrate when writing code. To be able to use code to solve problems.

## Tynker

'Drag and drop' visual programming



The code starts when we press play.

This tells the character to walk one space.

This tells the character to jump.

## Vocabulary Bank

### Computer

*An electronic machine that follows instructions.*

### Algorithm

*A set of instructions for a computer.*

### Repeat

*Instructions that happen more than once.*

### Conditional

*WHEN something happens... THEN do the instruction.*

### Function

*A saved set of instructions.*

### Programming

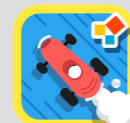
*When we tell a computer an instruction to complete.*

## Apps Used



**Kodable**

**Daisy the Dinosaur**



**Code Karts**

**Tynker**



**Hopscotch**

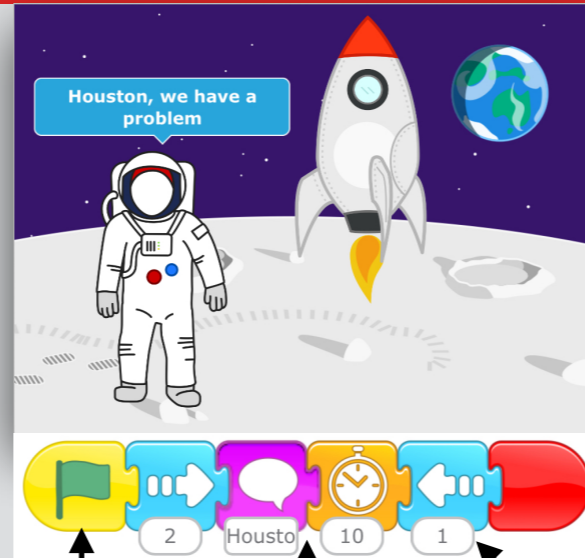
# iProgram: iFunction Lite Level 2

## Course Evaluation Criteria

**Y2: We would expect all children in Y2 to attain statements 1-5. If statements 6 or 7 are attained, those pupils are exceeding expectations.**

1. Pupils know what a conditional is.
2. Pupils know why they would need to use functions.
3. Pupils are able to create a character to follow a simple code.
4. Pupils are able to use shapes to create a picture.
5. Pupils know what a storyboard is.
6. Pupils can change at least one variable in their work.
7. Pupils are able to program two characters interacting with one another.

## Coding - ScratchJr



When starting the program, you must always start with the green flag command at the start.

These blocks tell the character which direction to move.

The text blocks add written text to make the characters talk.

## Vocabulary Bank

### Algorithm

*A set of instructions for a computer.*

### Repeat

*Instructions that happen more than once.*

### Conditional

*WHEN something happens... THEN do the instruction.*

### Function

*A saved set of instructions.*

### Programming

*When we tell a computer an instruction to complete.*

### Storyboard

*Storyboards are scenes we create before creating a story.*

### Variable

*A number that can change as the program runs.*

## Course overview

**Course overview:** iFunction looks at creating programs to solve real-world problems. Building upon their knowledge of 'Blockly' from Level 1 they will apply it to create games, control solutions and other problems mimicking real application of programming. We will also introduce written programming languages and learn basic syntax.

**Learning Outcome for the course:** To be able to understand how 'If, and, or, else' statements are used within programming. To be able to design a program on a storyboard and have the skills to create their program in Hopscotch.

## Apps Used



**Kodable**



**ScratchJr**



**Tynker**



**Hopscotch**



# iProgram: iLogic Level 1

## Course Evaluation Criteria

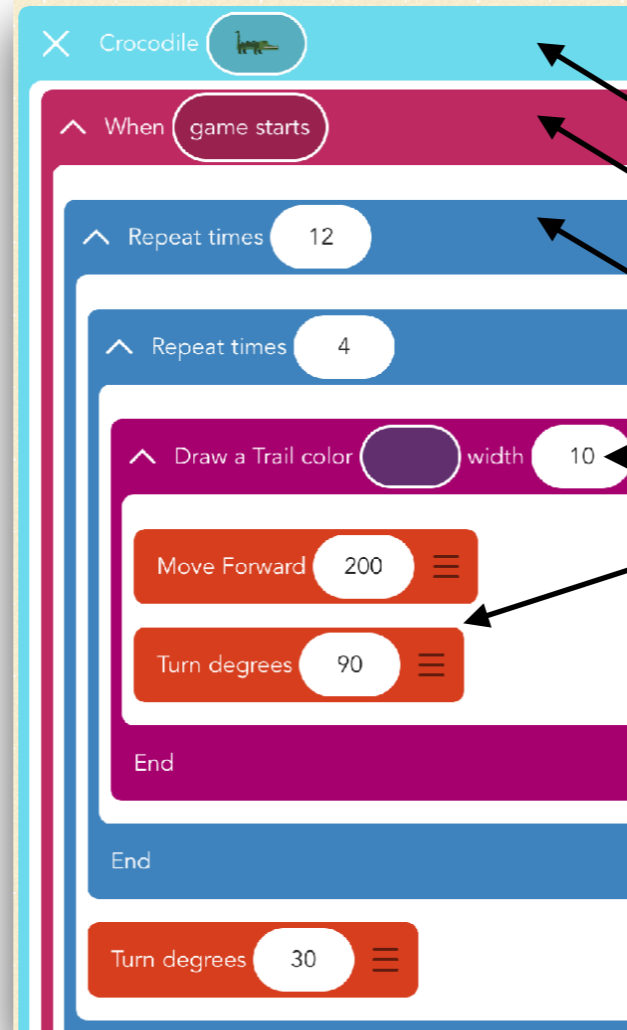
**Y3: We would expect all children in Y3 to attain statements 1-6. If any of statements 7-10 are attained, those pupils are exceeding expectations.**

1. Pupils are able to define what a computer is.
2. Pupils can explain what an algorithm is and write their own.
3. Pupils know why you should shorten algorithms.
4. Pupils know how variables change code.
5. Pupils are able to locate errors in their code.
6. Pupils are able to run tests in order to fix their code.
7. Pupils can explain what computer science is.
8. Pupils are able to identify when to use repeats to speed up their code.
9. Pupils can explain what binary is.
10. Pupils are able to identify, test and fix errors in their code.

## Course Overview

**Course overview:** Pupils will use games to learn key coding skills. They will learn how to use the coding language 'Blockly' to introduce key programming elements such as steps, loops, basic logic and functions such as 'if' statements. This will progress onto using code to create 'Spirograph' style artwork.

**Learning Outcome for the course:** To learn to program simple shapes and eventually a small game. To know the basic logical steps needed when designing code and the best way to write it. To understand the difference between WAN and LAN networks.







## Blockly: Hopscotch

- This is the character that that the code is related to.
- This is the conditional, it tells the computer when to complete the algorithm.
- This is a repeat. It tells the computer how many times to repeat the code below.
- Draw a trail tells the computer to draw a line and in what colour and thickness.
- These are movement instructions.

## Vocabulary Bank

<b>Computer</b>	<i>A machine that follows instructions.</i>
<b>Computer Science</b>	<i>Mixing human ideas with digital tools.</i>
<b>Algorithm</b>	<i>A set of instructions for a computer.</i>
<b>Repeat</b>	<i>Instructions that happen more than once.</i>
<b>Conditional</b>	<i>An 'If' or 'When' statement in our code.</i>
<b>Function</b>	<i>A saved set of instructions.</i>
<b>Variable</b>	<i>A number that can change as the program runs.</i>
<b>Binary</b>	<i>The language computers use.</i>

## Course Overview

-  **Tynker**
-  **Hopotch**
-  **Sphere Edu**
-  **Lightbot code hr**

# iProgram: Advanced iFunction Level 2

## Course Evaluation Criteria

**Y4:** We would expect all children in Y4 to attain statements 1-6. If any of statements 7-10 are attained, those pupils are exceeding expectations.

1. Pupils can recreate programs using prompt code.
2. Pupils can visually differentiate between coding languages.
3. Pupils can add a scoreboard to their pre-existing code.
4. Pupils understand how to use variables to expand their program.
5. Pupils can create a game using conditionals.
6. Pupils are able to code variables.
7. Pupils are able to debug their own work.
8. Pupils can start to code using Swift.
9. Pupils can explain the difference between what a variable and a conditional would do.
10. Pupils can code using randomisation.

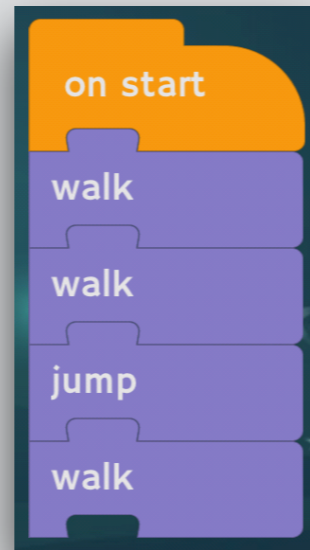
## Course overview

**Course overview:** Advanced iFunction looks at creating programs to solve real-world problems. Building upon their knowledge of 'Blockly' from Level 1 they will apply it to creating classic arcade games, control solutions and other problems mimicking real applications of programming. Pupils will also learn how to expand their code during the latter part of the course.

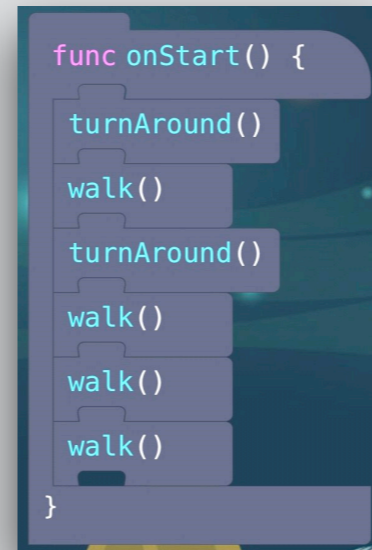
**Learning Outcome for the course:** Throughout iProgram Level 2 we will be learning about 'Function' and 'Syntax' through various coding tasks.

## Coding Language

### Blockly



### Swift



Swift is written code, whereas Blockly is blocks that you drag and drop and make sure they all link together.

## Vocabulary Bank

### Computer Science

*Mixing human ideas with digital tools.*

### Algorithm

*A set of instructions for a computer.*

### Repeat

*Instructions that happen more than once.*

### Conditional

*An 'If' or 'When' statement in our code.*

### Variable

*A number that can change as the program runs.*

### Binary

*The language computers use.*

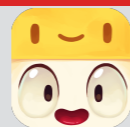
### Swift

*Swift is a written coding language.*

### Syntax

*The order/structure of the functions in the code.*

## Apps used



**Spirit Box**



**Tynker**



**Hopscotch**

# iProgram: iDebug Level 3

## Course Evaluation Criteria

**Y5: We would expect all children in Y5 to attain statements 1-6. If any of statements 7 - 10 are attained, those pupils are exceeding expectations.**

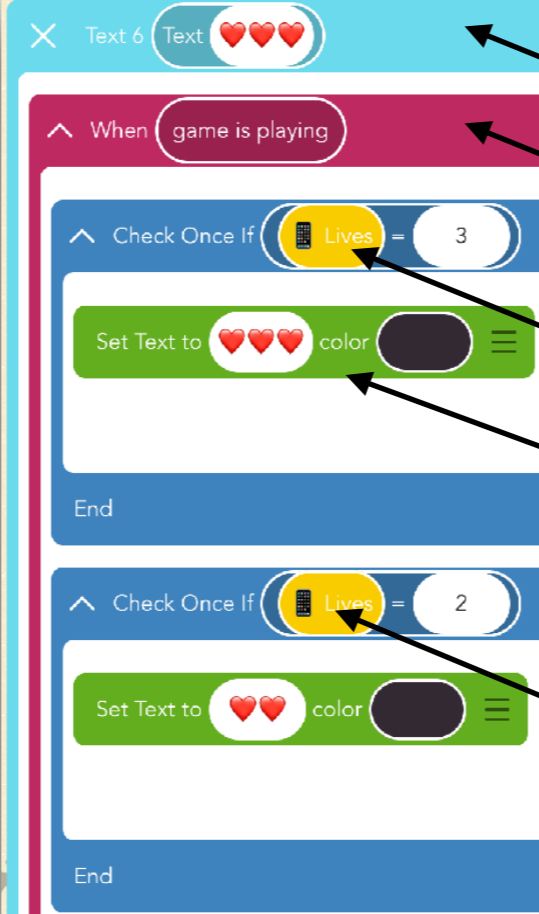
1. Pupils can explain what debugging means.
2. Pupils are able to branch pre-existing programs.
3. Pupils can define the word automation.
4. Pupils can identify real-world digital solutions.
5. Pupils can create a game using prompt text.
6. Pupils can give examples of different automated systems.
7. Pupils can fix codes when errors are pointed out.
8. Pupils can program real-world solutions.
9. Pupils can evaluate other pupils' work and identify errors.
10. Pupils can use the random function effectively.

## Course overview

**Course overview:** This workshop will require students to use their knowledge of 'Blockly' to search through a broken program and repair the mistakes to make the program function correctly. They will then progress to create programs of their own design.

**Learning Outcome for the course:** Pupils will learn how to effectively debug their own work, how to spot errors in the code and have enough knowledge to know how to change it. They will also learn about real-world programming solutions.

## Blockly: Hopscotch



Text Character

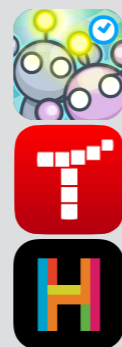
Conditional: Run code when game starts.

Control Flow

Set text: Changes the text displayed.

Variable: Amount of lives can change throughout the game.

## Apps used



**Lightbot Hour**

**Tynker**

**Hopscotch**

## Vocabulary Bank

**Computer Science**

*Mixing human ideas with digital tools.*

**Algorithm**

*A set of instructions for a computer.*

**Repeat**

*Instructions that happen more than once.*

**Conditional**

*An 'If' or 'When' statement in our code.*

**Function**

*A saved set of instructions.*

**Variable**

*A number that changes as the program runs.*

**Binary**

*The language computers use.*

**Automation**

*Programs that reduce the need for human input.*

**Debug**

*Finding mistakes in code and fixing them.*

**Program**

*Writing algorithms for computers to follow.*

**Syntax**

*The structure and order of the functions in our code.*



# iProgram: iDevelop Level 4

## Course Evaluation Criteria

**Y6: We would expect all children in Y6 to attain statements 1-6. If any of statements 7-10 are attained, those pupils are exceeding expectations.**

1. Pupils can explain what a clone value does.
2. Pupils can recognise JavaScript and know it's a programming language.
3. Pupils can use a function in conjunction with commands.
4. Pupils can define AI.
5. Pupils can include logic operators into their programs.
6. Pupils can give examples of AI in the real world.
7. Pupils can program multiple functions into multiple characters.
8. Pupils can code a program into JavaScript using logic operators.
9. Pupils can use multiple clone values within the same code.
10. Pupils can code a program to give the illusion of choice.

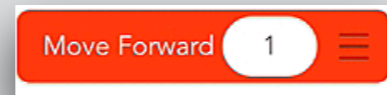
## Course overview

**Course overview:** After learning the main programming skills in Levels 1-3 using the 'Blockly' language, the pupils will progress to learning 'Swift'. Through Swift they will learn how to manipulate written code. The course will then give the students the freedom to create a final project to demonstrate their abilities.

**Learning Outcome for the course:** Over the course of iProgram Level 4 pupils will learn to code in JavaScript and create intricate programs that give the illusion of AI (Artificial Intelligence).

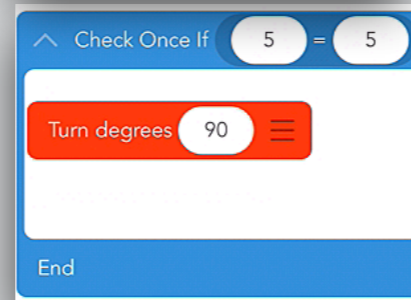
## Coding Language

### Blockly



### Swift

```
moveForward()
```



```
if 5 == 5 {
    turnLeft()
}
```

Swift and Blockly provide the same instructions within the code.

Blockly is more user friendly.

Swift is written code, whereas Blockly is blocks that you drag and drop and make sure they all link together.

## Apps Used



**Playgrounds**



**Sphero Edu**



**Hopscotch**

## Vocabulary Bank

### Computer Science

*Mixing human ideas with digital tools.*

### Algorithm

*A set of instructions for a computer.*

### Repeat

*Instructions that happen more than once.*

### Conditional

*An 'If' or 'When' statement in our code.*

### Function

*A saved set of instructions.*

### Variable

*A number that can change as the program runs.*

### Binary

*The language computers use.*

### JavaScript

*A written coding language.*

### Commands

*A single instruction used in coded language.*

### Automation

*Programs that reduce the need for human input.*

### AI

*Artificial Intelligence is when machines can do things that require intelligence.*