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

Logic Train

Amazing Escapes

Code Karts

Sketches

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 1-7. If any of statements 8-10 are attained, those pupils are exceeding expectations.

1. Pupils know what a computer is.
2. Pupils know another word for instructions is algorithms.
3. Pupils know repeats are used to shorten code.
4. Pupils understand that computers make decisions based on conditionals.
5. Pupils know why code is given to machines to complete tasks.
6. Pupils know what a function is.
7. Pupils can write their own code for a character.
8. Pupils can confidently add loops into their code.
9. Pupils can use multiple functions in their code to complete tasks.
10. Pupils can use conditionals to solve a puzzle on the app Hopscotch.

Course Overview

Course overview: During iCode pupils will use games to learn key coding skills. The course will start by looking at everyday tasks and thinking about the thought behind a series of problems within the app 'Kids Coding'. This will culminate in students learning how to use more complex coding apps for their age like Hopscotch and using the word algorithm with ease.

Learning Outcome for the course: To learn to program simple shapes on the app Kids Coding. To understand how to write in steps and be able to demonstrate when writing code. To be able to use code to solve problems.
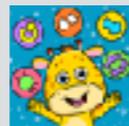
Tynker
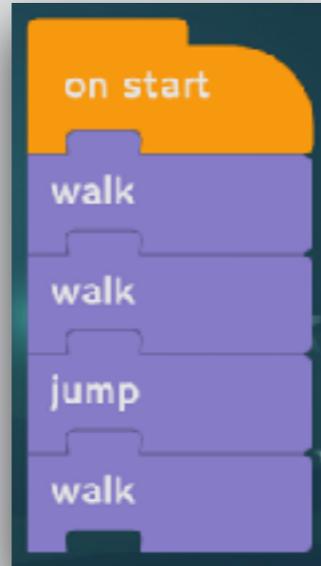
The code starts when we press play.

This tells the character to walk one space.

This tells the character to jump.

`on start`
`walk`
`walk`
`jump`
`walk`

Apps Used

Kids Coding

Daisy the Dinosaur

Code Karts

Tynker

Hopscotch

Vocabulary Bank

Computer	*An electronic machine that follows instructions.*
Algorithm	*A set of instructions for a computer to follow.*
Repeat	*Instructions that happen more than once.*
Conditional	*WHEN something happens… THEN do the instruction.*
Function	*The name for an instruction in programming.*
Coding	*Writing computer programs.*

iProgram: iBlockly Lite Level 2

Course Evaluation Criteria

Y2: We would expect all children in Y2 to attain statements 1-7. If any of statements 8-10 are attained, those pupils are exceeding expectations.

1. Pupils understand that programming is telling a computer what to do.
2. Pupils know that an algorithm is a set of instructions.
3. Pupils know that Blockly is a programming language.
4. Pupils can give an example of a conditional.
5. Pupils understand how to add code to characters on the app Hopscotch.
6. Pupils know what the word Random means.
7. Pupils understand that programming can be used to create pieces of art.
8. Pupils are able to find errors in their code and fix it.
9. Pupils can confidently manipulate their code to change the outcome of their program.
10. Pupils can add extra characters into their program and create their own code for them to follow.

Course Overview

Course overview: This course introduces the pupils to world of Blockly, a simple programming language. They will learn how to use it to create their own code, whilst thinking about conditionals, functions and using randomisation. They will also be challenged in their accuracy in creating and copying code, as well as finding and fixing any errors.

Learning Outcome for the course: Pupils will be able to understand what Blockly is, and confidently use it to code on the Hopscotch app. They will be able to create multiple programs for multiples characters and change the outcome of their code based on multiple conditionals.

ScratchJr

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

These blocks tells the character which direction to move.

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

Apps Used

A.L.E.X

ScratchJr

Tynker

Hopscotch

Vocabulary Bank

Algorithm	*A set of functions or instructions for a computer.*
Conditional	*WHEN something happens… THEN do the instruction.*
Function	*The name for an instruction in programming.*
Programming	*When we tell a computer an instruction to complete.*
Blockly	*A visual coding language that uses drag and drop.*
Random	*Information that isn't chosen beforehand.*

iProgram: iLogic Level 1

Course Evaluation Criteria

Y3: We would expect all children in Y3 to attain statements 1-7. If any of statements 8-10 are attained, those pupils are exceeding expectations.

1. Pupils can define what a computer is.
2. Pupils can explain what an algorithm is and write their own.
3. Pupils can explain what binary is.
4. Pupils know why you should shorten algorithms.
5. Pupils know that to become a programmer, you must be good at solving problems.
6. Pupils know what Computer Science is.
7. Pupils understand how repeats work and can use them in their code.
8. Pupils understand that conditionals are needed to make something work.
9. Pupils know that variables change numbers in a code while the program is running.
10. Pupils can test, identify 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 functions, loops, conditionals and variables. This will progress into using code to create 'Spirograph' style artwork and creating a modern version of an Etch-A-Sketch.

Learning Outcome for the course: To learn what algorithms are and use them to code a variety of programs. They will know what functions are and that computer science is the art of blending human ideas with digital tools.
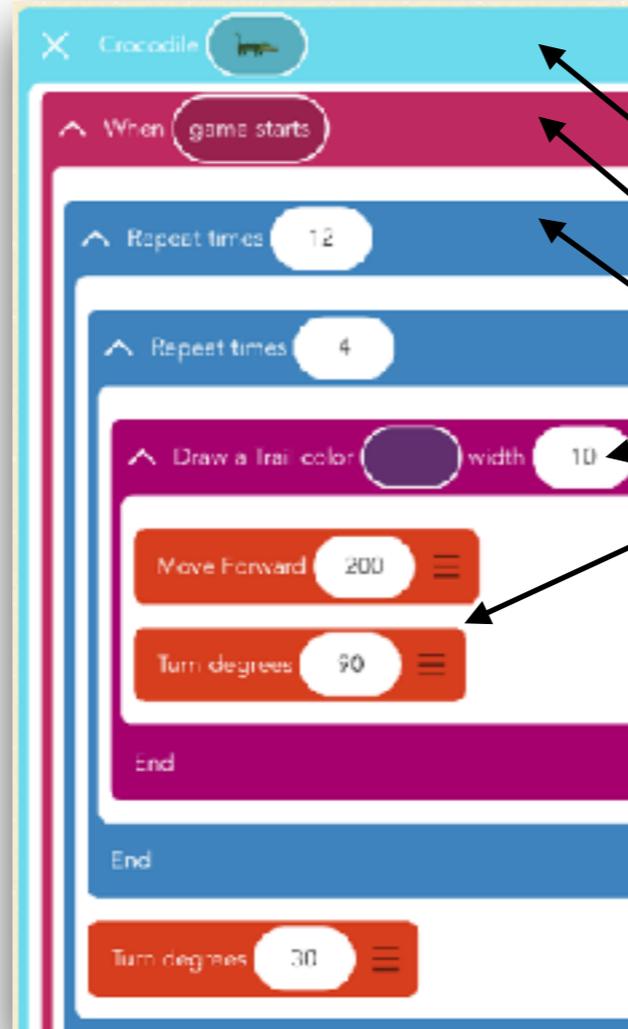
Hopscotch

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.

Course Overview

Tynker

Binary

Hopsotch

Sphero Edu

Lightbot

Vocabulary Bank

Computer Science	Mixing human ideas with digital tools.
Algorithm	A set of instructions for a computer.
Conditional	An 'If' or 'When' statement in our code.
Variable	Part of a code that can change as a program is being run.
Binary	The language computers use.
Programming	When we tell a computer an instruction to complete.
Blockly	A visual coding language.
Computer Scientist	Someone who uses coding to create computer programs.

iProgram: iFunction Level 2

Course Evaluation Criteria

Y4: We would expect all children in Y4 to attain statements 1-7. If any of statements 8-10 are attained, those pupils are exceeding expectations.

1. Pupils know that an algorithm is a set of instructions.
2. Pupils know that Blockly is a programming language.
3. Pupils can create basic shapes using Blockly on Hopscotch.
4. Pupils understand what the random function is and can use it in their algorithms.
5. Pupils can use Blockly to control an external component such as the Sphero robot.
6. Pupils understand that using repeats can make algorithms quicker and easier to write and understand.
7. Pupils understand what Swift is.
8. Pupils know that computational thinking is used to solve problems.
9. Pupils know that a variable allows a number to change while a program is running.
10. Pupils can use a variable to create expanding patterns.

Course Overview

Course overview: iFunction looks at understanding different programming languages and what each part of a code does to the program. Time will be spent looking at what every function does in detail by focusing on each one through the learning session and then consolidating those functions and the knowledge that pupils will gain to create a piece of artwork.

Learning Outcome for the course: Pupils will learn how to understand each function and if they combine many of the functions, they can create a bigger, more powerful algorithm for many uses. They will learn about different types of functions and their role in an algorithm.

Coding Language

Text characters can be used to add more code into a project

Create variables in the code to alter the program as it runs

Add a random element into the values of functions to create unpredictability

Apps Used

Sprite Box   A.L.E.X.

Tynker   Danger Quest

Hopscotch   Sphero Edu

Lightbot

Vocabulary Bank

Algorithm	*A set of instructions or functions 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.*
Swift	*Swift is a written coding language.*
Programming	*When we give instructions to a computer or program.*
Blockly	*A visual coding language.*
Function	*The name for an instruction in programming.*
Random	*Information that isn't chosen beforehand*
Computational Thinking	*Breaking a problem into steps to solve it more easily.*

iProgram: iDebug Level 3

Course Evaluation Criteria

Y5: We would expect all children in Y5 to attain statements 1-7. If any of statements 8-10 are attained, those pupils are exceeding expectations.
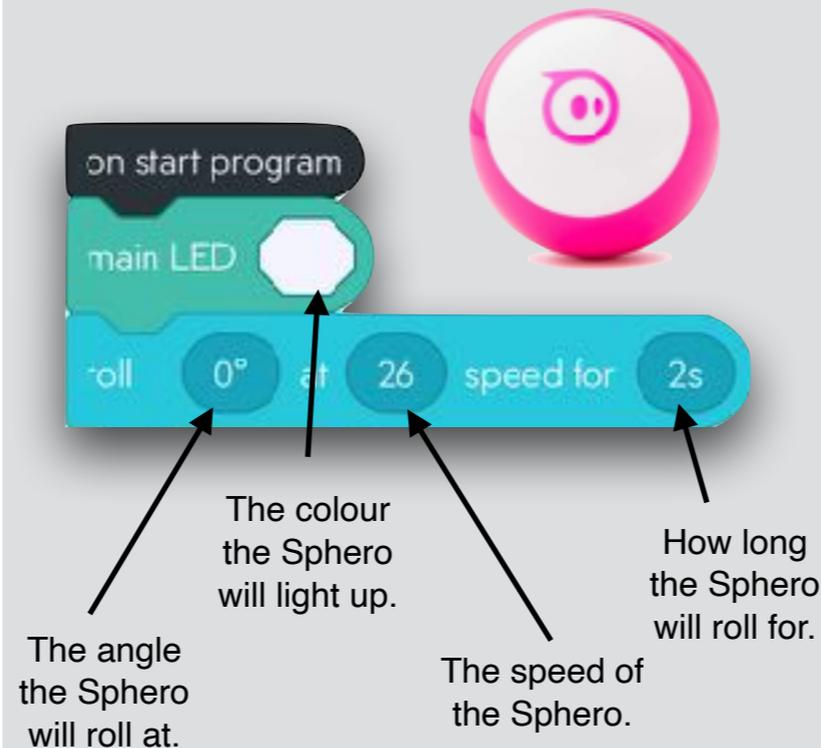
1. Pupils can create basic shapes using Blockly on Hopscotch.

2. Pupils understand that programs can have issues called bugs.

3. Pupils know that debugging is removing the bugs and therefore fixing algorithms.

4. Pupils can debug three out of five of the provided programs.

5. Pupils understand conditionals and that they are needed to create different types of controls to create games.

6. Pupils can debug the Sphero code and run the program successfully.

7. Pupils know that a variable allows a number to change while a program is running.

8. Pupils can create controls for a main character in an Endless Runner type game.

9. Pupils can debug all five of the provided programs.

10. Pupils can create a complex version of an Endless Runner game with lives, scores and more features.
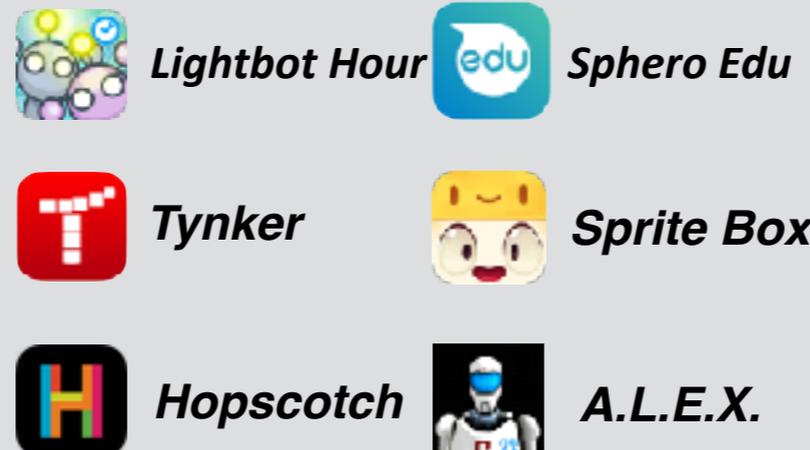
Course Overview

Course overview: Pupils will need to understand how programs work. They will create shapes to learn the basics of programming then move onto fixing or 'debugging' existing computer programs, progressing with their programming knowledge and then developing their own arcade games using many functions that they will learn about during this course.

Learning Outcome for the course: Pupils will know 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 have an understanding of real-world programming solutions.

Sphero

The colour the Sphero will light up.

How long the Sphero will roll for.

The angle the Sphero will roll at.

The speed of the Sphero.

Apps Used

Lightbot Hour

Sphero Edu

Tynker

Sprite Box

Hopscotch

A.L.E.X.

Vocabulary Bank

Algorithm	*A set of instructions or functions for a computer.*
Conditional	*An 'If' or 'When' statement in our code.*
Variable	*A number that changes as the program runs.*
Debug	*Finding mistakes in code and fixing them.*
Branch	*A copy of code-line so we can see completed and uncompleted code to help people work together*
Real-World Programming	*Programming for real-world objects or programs, such as traffic lights*

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 know the difference between Blockly and Swift.
2. Pupils can code simple geometric shapes on Hopscotch.
3. Pupils understand how the conditional 'When is Tapped' works.
4. Pupils can include the feature 'Last Touch' into their code.
5. Pupils understand how variables and the function 'Check Once If' are linked.
6. Pupils can write code using at least two functions to control an external object.
7. Pupils can write at least two functions in JavaScript.
8. Pupils can code a melody using various rhythms and notes.
9. Pupils can code a 'Rock, Paper, Scissors' program with two characters.
10. Pupils can code an external robot using JavaScript to successfully complete a physical course.

Course Overview

Course overview: Pupils will learn about multiple coding languages including Blockly, Swift and JavaScript to write their own code. They will be able to use their knowledge of coding to understand how it translates to real world programming, and which different functions and conditionals should be used for specific desired outcomes.

Learning Outcome for the course: Pupils will be able to code their own programs, starting with simple shapes and art pieces to progressing to musical instruments and games. They will be able for code for an external object and feel confident in alternating between Blockly and written coding languages.

Programming Languages

Blockly   **Swift**

```
var x = 7 + 3;

Print (x);

repeat (5){
    x = x + 9 * 3;
    wait (1000);
    print (x);
}
```
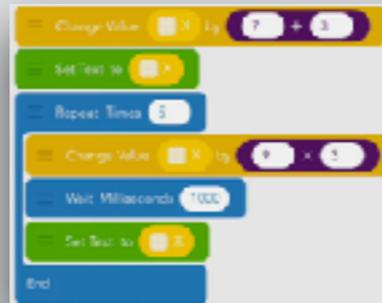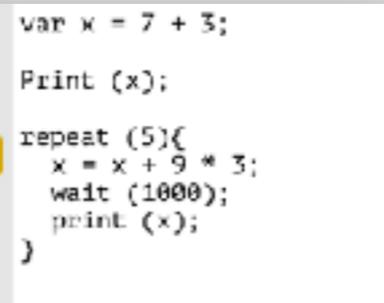
Swift and Blockly provide the same instructions within the code.

Blockly is more user friendly as it uses clearer language, colour categorised functions and is drag-and-drop.

Swift is written code, which makes it more difficult to understand. However because of this it has little to no limitations compared to Blocky.

Apps Used

Sprite Box

Sphero Edu

Hopscotch

Vocabulary Bank

Blockly	*A visual programming language that uses drag and drop.*
Swift	*A written programming language.*
Function	*An instruction given to a computer.*
Algorithm	*A group of functions in a sequenced order.*
Conditional	*A 'When' or 'If' statement that instructs when a program should be run.*
Last Touch	*A feature that uses the area of an iPad tapped as a value within a function.*
Create A Clone	*A function that creates a copy of an algorithm.*
Variable	*Part of a code that varies while a program is run.*
Check Once If	*A functions used to decide when functions should run depending on a variable.*
JavaScript	*A written programming language used instead of the limited Blockly language.*