



## Computing Knowledge Progression in Westfield

### KS1 Cycle A

	1 <sup>st</sup> Half Term	2 <sup>nd</sup> Half Term
Autumn	<b>iAlgorithm (Y1): Giving and following instructions</b>	<b>iProgram (Unit 1 Y1): Algorithms &amp; Programming</b>
	<ul style="list-style-type: none"> <li>- Understand algorithms and precise instructions.</li> <li>- Follow and devise simple algorithms</li> <li>- To plan, test and debug a simple algorithm</li> <li>- Make predictions about an outcome based on a simple algorithm.</li> </ul>	<ul style="list-style-type: none"> <li>Understand that algorithms are implemented on programs on a range of devices</li> <li>- give instructions to a programmable toy</li> <li>- to plan a simple algorithm that controls a toy</li> <li>- programme a virtual object to move on-screen objects</li> <li>- record a sequence of instructions</li> </ul>
Spring	<b>iWrite (Y1): Creating digital texts</b>	<b>iAnimate (Y2): Introduction to animation</b>
	<ul style="list-style-type: none"> <li>- recognise text can be created in a number of ways</li> <li>- use word processing software to create text</li> <li>- understand that a computer can be connected to a printer.</li> <li>- select and input text into a word processing application</li> <li>- open and save a word processing document.</li> </ul>	<ul style="list-style-type: none"> <li>- understand what animation is</li> <li>- understand the premise of stop-frame animation</li> <li>- understand that animation consists of characters, a stage, props, sound, text and a story.</li> <li>- understand the importance of a story board</li> <li>- create their own story board</li> <li>- animation needs to be scripted</li> <li>- to work collaboratively in groups</li> <li>- to create a stop-frame animation</li> </ul>
Summer	<b>iBlog (Y2): Writing and responding with blogging</b>	<b>iDo Mail (Y2): Introduction to email</b>
	<ul style="list-style-type: none"> <li>- know what a blog is and how it will be used in the classroom</li> <li>- to know how to respond to the writing of others</li> <li>- to know how to post on a blog</li> </ul>	<ul style="list-style-type: none"> <li>- understand that messages can be sent electronically over distances</li> <li>- understand that people can reply to messages</li> <li>- understand that communication can be images, sounds and text</li> </ul>

### KS1 Cycle B

	1 <sup>st</sup> Half Term	2 <sup>nd</sup> Half Term
Autumn	<b>iModel (Y1): Computer modelling</b>	<b>iProgram (Unit 2 Y1): Algorithms &amp; Programming</b>
	<ul style="list-style-type: none"> <li>- understand that computers can show real events and things</li> <li>- to use a mouse to move things around on the screen</li> <li>- understand that computers can be use to make choices</li> <li>- create a depiction of a real of fantasy story.</li> </ul>	<ul style="list-style-type: none"> <li>- understand that the order and number of steps in an algorithm correspond to the order and number of actions.</li> <li>- to understand the order of commands corresponds to the order of actions in a program</li> </ul>

		<ul style="list-style-type: none"> <li>- understand a background can be used and created in projects</li> <li>- to understand the speed of a sprite can be changed</li> <li>- to understand the different sprites can be programmed to move at different speeds</li> <li>- create a storyboard and short animation</li> </ul>
Spring	<b>iData (Y1): Introducing data representations</b>	<b>iPub (Y2): Creating ebooks</b>
	<ul style="list-style-type: none"> <li>- Understand why pictograms are useful</li> <li>- collect and organise information to solve a problem</li> <li>- create a graph and pictogram using digit tools</li> <li>- sort information on criterion</li> </ul>	<ul style="list-style-type: none"> <li>- understand the world wide web and how it has developed through time</li> <li>- to consider how technology changes with time</li> <li>- to create an interactive ebook</li> </ul>
Summer	<b>iProgram (Y2): Creating animations</b>	<b>iSearch (Y2): Finding things out online</b>
	<ul style="list-style-type: none"> <li>- understand that algorithm is a progress that consist of a series of steps</li> <li>- know that steps can be repeated</li> <li>- understand algorithms can describe everyday activities and can be followed by humans and computers</li> <li>- understand computers need more precise instructions that humans</li> <li>- to program a simple animation involving movement</li> <li>- write a simple program</li> <li>- combine images and text to create a simple animation</li> </ul>	<ul style="list-style-type: none"> <li>- understand the internet contains a large about of information</li> <li>- to know the world wide wed can be used to answer questions</li> <li>- use links to navigate websites</li> <li>- to use hyperlinks</li> <li>- locate information using a website</li> <li>- collect information from a number of different online sources and check they are the same</li> </ul>

### Online Safety

Online Safety should be part of daily discussions in the classroom and addressed whenever technology is used.

iSafe:

- understand what being online may look like, the different feelings we can experience online
- how to identify and approach adults who can help
- understand that people online may try to manipulate others, how this can make someone feel and how to approach adults who can help.
- understand photos can be shared online
- understand the importance of seeking permission before sharing photos of others online
  - understand what personal information means
- understand that personal information is unique to themselves
- understand personal information should be only be given to trusted adults

- understand that not everyone you meet is trustworthy
- begin to identify the characteristics of people who are trustworthy
- understand that emotions can be a tool to help judge unsafe situations
- understand the importance to checking with an adult before going online

Year 3 & 4 Cycle A

	1 <sup>st</sup> Half Term	2 <sup>nd</sup> Half Term
Autumn	<b>iProgram (Unit 1 Y3): Games &amp; animation development</b>	<b>iSimulate (Y3): Exploring computer simulations</b>
	<ul style="list-style-type: none"> <li>- Understand that a program is a sequence of statements written in a programming language</li> <li>- Program an animation that executes a sequence of statements</li> <li>- Understand that computer programs containing graphics use x y coordinates</li> <li>- Program a sequence of instructions to create a visual effect</li> <li>- Import, create and record sounds</li> <li>- Understand that algorithms and programs can involve repetition</li> <li>- Import pictures from a computer and / or the internet</li> <li>- Combine images, sounds and movement to create an animation</li> </ul>	<ul style="list-style-type: none"> <li>- Understand that computer simulations can represent real or imaginary situations</li> <li>- Understand that computer simulations are guided by rules</li> <li>- Explore the effect of changing variables in a simulation and use them to make and test predictions</li> <li>- Understand the simulation can help people try things</li> <li>- Understand that simulations help us to understand difficult concepts</li> <li>- Design and produce a computer simulation or game</li> </ul>
Spring	<b>iAnimate (Y4): Introduction to animation</b>	<b>iData (Y3): Introducing Databases</b>
	<ul style="list-style-type: none"> <li>- Understand what an animation is</li> <li>- Create a scene for an animation</li> <li>- understand that animation can be created using digital tools</li> <li>- Create an animation scene</li> </ul>	<ul style="list-style-type: none"> <li>- Understand how information in a database is organised</li> <li>- Understand the advantages of a computer database over a paper one</li> <li>- Find and enter information to create records in a database</li> </ul>
Summer	<b>iDoMail (Y4): Working together with email</b>	<b>iProgram Unit 2 (Y3)</b>
	<ul style="list-style-type: none"> <li>- Understand that messages can be used to communicate over distance a number of ways</li> <li>- Understand how email travels and how to retrieve it</li> <li>- Send and reply to emails</li> <li>- Attach a file to an email</li> <li>- Use email to communicate ideas</li> </ul>	<ul style="list-style-type: none"> <li>- design, write and debug programmes</li> <li>- solve problems by decomposing them into smaller parts</li> <li>- use sequence, selection, repetition in programmes</li> <li>- use logical reasoning how algorithms work</li> </ul>

Year 3 & 4 Cycle B

	1 <sup>st</sup> Half Term	2 <sup>nd</sup> Half Term
Autumn	<b>iConnect (Y3): Internet, Searching &amp; WWW</b>	<b>iData (Y4): Data representation</b>
	<ul style="list-style-type: none"> <li>- Understand that the internet is many computers that are connected</li> <li>- To understand some of the services available on the internet</li> <li>- Understand that you can move around the web using hyperlinks</li> <li>- Use basic navigation skill to browse the www</li> <li>- Know the main features of web browsers</li> <li>- Understand how to find information using a search engine</li> <li>- Understand that not all information on the web is reliable</li> <li>- Know the basic steps that can help distinguish safe and credible websites</li> </ul>	<ul style="list-style-type: none"> <li>- Understand that computers represent data as numbers and count using switches of 'on' and 'off'</li> <li>- Understand that information can be stored as numbers, text and choices</li> <li>- Understand that storing information in an organised way helps answer questions</li> <li>- Search a database to answer a question</li> <li>- Use information in a database to create a simple chart</li> </ul>
Spring	<b>iNetwork (Y3): Introducing Networks</b>	<b>iProgram (Unit 4 Y4): Program king shapes &amp; navigating mazes</b>
	<ul style="list-style-type: none"> <li>- Understand what a network is</li> <li>- Know parts of a computer network</li> <li>- Understand how information is exchanged between devices</li> <li>- Understand that the internet is a physical connection between computers and networks</li> <li>- Understand how data travels throughout a network</li> <li>- Understand that devices have a unique address.</li> </ul>	<ul style="list-style-type: none"> <li>- Understand that a program is a sequence of statements written in a programming language</li> <li>- Program a turtle to execute a sequence of statements</li> <li>- Understand that computer programs consist of statements that perform a specific task</li> <li>- Amend an algorithm to change the size of a shape</li> <li>- Program a virtual robot to move and draw</li> <li>- Design a program that makes choices</li> <li>- Understand that commands and actions can be programmed</li> <li>- Develop algorithms</li> </ul>
Summer	<b>iPodcast Y3:</b>	<b>iProgram (Unit 1 Y4): Programming puzzle solutions</b>
	<ul style="list-style-type: none"> <li>- Understand that technology can be used to control sound</li> <li>- Understand that sound can be stored digitally</li> <li>- Understand what a podcast is</li> <li>- Plan, record a podcast</li> </ul>	<ul style="list-style-type: none"> <li>- Solve problems by splitting them into smaller parts</li> <li>- Plan and develop algorithms and programs</li> <li>- Understand that procedures in computers programs allow programmers to use a set of commands more than once and that this is called abstraction</li> </ul>

- Edit a podcast - Combine audio, sound and effects	
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<b>Online Safety</b>	
-safety should be part of daily discussions in the classroom and addressed whenever technology is used.	
iSafe	
- empathise with those who have received mean and hurtful messages	
- Judge what it means to cross the line from harmless to harmful communication online	
- Generate solutions for dealing with cyber bullying	
- Identify the characteristics of strong passwords	
- Apply characteristics of strong passwords to create new passwords	
- Compare and contrast online-only friends and in person, face to face friends	
- Analysis why private information should not be given to anyone online without permission from a trusted adult	
- Debate how to respond if an online only friend asks them personal questions	

Year 5 & 6 Cycle A		
	1 <sup>st</sup> Half Term	2 <sup>nd</sup> Half Term
Autumn	<b>iProgram (Unit 1 Y5): Designing and developing programs</b>	<b>iCrypto (Y5): Cryptography</b>
	<ul style="list-style-type: none"> <li>- Understand that computer programs containing graphics using xy coordinates and turns are measured in degrees</li> <li>- Understand that some variables can only be true or false</li> <li>- Understand that programs can do different things if the value of a boolean variable is true or false</li> <li>- Create a game that senses events on screen</li> <li>- Program statements that make something happen in response to events on screen</li> <li>- To be able to understand what a variable is and why they are useful</li> <li>- Understand that variables can be used in programming to keep track of values</li> <li>- Program statements that make something happen in response to the value of a variable</li> <li>- Develop an outline of tasks and activities required to develop a project</li> <li>- Develop for testing and debugging computer programs</li> </ul>	<ul style="list-style-type: none"> <li>- Understand that messages can be sent and received secretly</li> <li>- Learn encrypt / decrypt simple messages</li> <li>- Understand signalling is a form of communication</li> <li>- Communicate simple messages through signals</li> <li>- Understand that messages can be sent electronically over distances</li> <li>- Understand that data can be transmitted as binary</li> <li>- Encode and decode Morse code</li> <li>- Understand that messages have been encrypted / Decrypted throughout time</li> <li>- Encode and decode messages using a simple shift cipher</li> <li>- Understand the algorithm of a simple shift cipher</li> <li>- Understand the importance of cryptography historically and today</li> <li>- Understand how the Enigma Machine operates</li> </ul>
Spring	<b>iWeb (Y5): Creating web content</b>	<b>iApp (Unit 2 Y6): Developing apps</b>

	<ul style="list-style-type: none"> <li>- Understand that the world wide web is one of the services offered on the internet</li> <li>- Know that the world wide web consists of many websites and webpages that can be accessed on the internet</li> <li>- Understand that many people remix content to work on the world wide web</li> <li>- Know that website are written in HTML</li> <li>- Know that HTML gives a web page structure</li> <li>- Change a picture on a web page</li> <li>- Use research for the creation of website</li> <li>- Upload an image for insertion into a website</li> </ul>	<ul style="list-style-type: none"> <li>- Understand the value of mobile technology and its future development</li> <li>- Explore event driven programming using a text-based programming language</li> <li>- Understand the importance of decomposition</li> <li>- Understand the event driven nature of bitsbox programming</li> <li>- understand that variables contain values</li> <li>- Use algorithms to develop a solution to a problem</li> <li>- Translate algorithms into code</li> <li>- Use abstraction and functions in programs</li> <li>- Understand that apps are computer programs that are developed according to a plan</li> <li>- Develop an app according to a plan</li> <li>- Develop strategies for testing and debugging computer programs</li> </ul>
Summer	<b>iProgramme (Unit 2 Y5): programming with Kodu</b>	<b>iModel (Y5): 3D graphical modelling</b>
	<ul style="list-style-type: none"> <li>- Create a world and control a character using coding</li> <li>- Use conditional statements in computer programmes</li> <li>- Program objects to move towards another</li> <li>- Amend a computer programme to accept user input</li> <li>- Program objects to move along paths</li> <li>- Understand how to create levels in a computer game</li> </ul>	<ul style="list-style-type: none"> <li>- Understand the difference between 2D and 3D shapes</li> <li>- Become familiar with 3D modelling tools</li> <li>- Understand that graphical models can be easily changed</li> <li>- Use features of graphical software to develop a 3D model</li> </ul>

Year 5 & 6 Cycle B		
	1 <sup>st</sup> Half Term	2 <sup>nd</sup> Half Term
Autumn	<b>iProgram (Unit 1 Y6): Designing and developing programs</b>	<b>iApp (Unit 2 Y6): designing and developing apps</b>
	<ul style="list-style-type: none"> <li>- Understand the different between games and simulations</li> <li>- Identify the various inputs that computer games can use</li> <li>- Program a computer game by sequencing conditional statements</li> <li>- Understand that the behaviour of a computer program should be planned</li> <li>- Understand that programs are developed according to a plan</li> <li>- Program a algorithm according to a plan</li> <li>- Develop a program according to a plan</li> <li>- Develop strategies for testing and debugging computer programs</li> </ul>	<ul style="list-style-type: none"> <li>- Understand the value of mobile technology in its future development</li> <li>- Explore event-driven programming using text-based programming language</li> <li>- Understand the importance of decomposition</li> <li>- Understand that variables contain values</li> <li>- Use algorithms to develop a solution to a problem</li> <li>- Translate algorithm into code</li> <li>- Use abstraction and functions in programs</li> </ul>
Spring	<b>iNetworks: Computer networks</b>	<b>iProgram (unit 2): Algorithms and Programming</b>
	<ul style="list-style-type: none"> <li>- Understand that a computer network is a group of computers that are connected</li> <li>- Know that computer networks allow users to communicate and share</li> <li>- Understand that the internet is many networks that are connected to each other</li> </ul>	<ul style="list-style-type: none"> <li>- Add an object to a scene</li> <li>- Program simple instructions</li> <li>- Use procedures to move objects on a screen</li> </ul>

	<ul style="list-style-type: none"> <li>- Know that a router sends / receives information as a packets of data</li> <li>- Know that computers connected to the internet have their own address</li> <li>- Understand that services involving web pages on the internet are known as the World Wide Web and that websites can be traced to a particular web server</li> <li>- Know that internet search engines maintain, and rank, list (or index) of other websites available on the world wide web</li> <li>- Use clear search terms when conducting internet searches in order to find things out</li> <li>- Know that website are written in HTML</li> <li>- Recognise use basic HTML syntax</li> </ul>	<ul style="list-style-type: none"> <li>- Test and debug an animation</li> <li>- Simplify a program using procedures</li> <li>- To use conditional statements</li> <li>- Understand and use variables in a computer program</li> <li>- Use decomposition to devise a storyboard for an animation</li> <li>- Develop an animation</li> </ul>
Summer	<b>iData (Y6): Spreadsheets</b>	<b>iModel (Y6): 3D graphical modelling</b>
	<ul style="list-style-type: none"> <li>- Identify some parts of a spreadsheet</li> <li>- Identify cell references</li> <li>- Understand that spreadsheets can be used to store numerical data and to make calculations</li> <li>- Understand that calculations with different values can be done quickly</li> <li>- Ensure a formula to calculate totals</li> <li>- Enter numerical data into cells</li> <li>- Understand that graphs and charts can be created and easily changed from spreadsheet data</li> <li>- Understand the SUM function can use used to create formulas that will perform addition calculations</li> <li>- Use a spreadsheet to model a costing exercise</li> </ul>	<ul style="list-style-type: none"> <li>- Become familiar with basic Sketch-up tools</li> <li>- Build a house to scale using Sketch-up</li> <li>- Use features of graphical modelling software to develop a 3D model</li> <li>- Evaluate and improve 3D models</li> <li>- Add images to 3D models</li> <li>- Import a Sketch-Up to Google Earth</li> </ul>

### Online Safety

<p>Online Safety should be part of daily discussions in the classroom and addressed whenever technology is used.</p> <ul style="list-style-type: none"> <li>- Recognise the importance of never sharing passwords, except with a parents or guardians</li> <li>- Understand the importance of screen locks</li> <li>- Know how to create passwords that are hard to guess, yet easy to remember</li> </ul>	<ul style="list-style-type: none"> <li>- Learn specific ways to respond to bullying when you see it</li> <li>- Know how to behave if you experience harassment</li> <li>- Make good decisions when choosing how and what to communicate and whether to communicate at all</li> <li>- Identify situations when it's better to wait to communicate face to face with a peer rather than straight away</li> </ul>	<ul style="list-style-type: none"> <li>- Recognising that seeking help for yourself and others in a strength</li> <li>- Be aware of online tools for reporting abuse</li> <li>- Evaluate what is meant to be a bystander or upstander online</li> <li>- Choose the right security for their login settings</li> <li>- Put what they have learnt into practice by playing online games</li> </ul>
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