Whipton Barton Federation Computing Long-Term Curriculum Map

At Whipton Barton Federation, we believe that technology plays a significant role in society today. Children are taught the skills and the correct morals, values and ethics to participate effectively and safely in this digital world which can only be achieved through a broad and diverse Computing curriculum.

Children in our EYFS classes learn to use technology in a responsible, competent and confident manner on a day-to-day basis during their independent learning through the use of iPads, Beebots and Microsoft Surfaces. Throughout their Reception year, children will begin to understand the scope of technology; using Google Earth to look at their local area and other countries around the world; using software to design and create art work; and using iPads to record their learning with photos and videos. The planned experiences and opportunities that the children encounter provided with them with firm foundations to build upon their knowledge and develop digital literacy for future learning.

At the core of our Key Stage One and Key Stage Two Computing curriculum, children are introduced to a wide range of technology, including PCs, iPads and interactive whiteboards, allowing them to continually practise and improve the skills they learn. This ensures they become digitally literate so that they are able to express themselves and develop their ideas through information and computer technology.

Our Computing curriculum enables children to become effective users of technology who can:

- Understand and apply the essential principles and concepts of Computer Science, including logic, algorithms and data representation;
- Analyse problems in computational term, and have repeated practical experience of writing computer programs in order to solve such problems;
- Evaluate and apply information technology analytically to solve problems;
- Communicate ideas well by utilising appliances and devices throughout all areas of the curriculum.

Internet Safety

At Whipton Barton Federation, we take internet safety extremely seriously. We have an Internet Policy that provides guidance for teachers and children about how to use the internet safely. Through Computing and the wider curriculum, children participate in e-safety lessons so that children understand how to stay safe online and report any concern they may have when using technology.

Year	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Reception	Children in our EYFS classes learn to use technology in a responsible, competent and confident manner on a day-to-day basis during their independent learning through the use of iPads, Beebots and Microsoft Surfaces. Throughout their Reception year, children will begin to understand the scope of technology; using Google Earth to look at their local area and other countries around the world; using software to design and create art work; and using iPads to record their learning with photos and videos. The planned experiences and opportunities that the children encounter provided with them with firm foundations to build upon their knowledge and develop digital literacy for future learning.					
Year	**Term 1**	**Term 2**	**Term 3**	**Term 4**	**Term 5**	**Term 6**
Year 1	**Technology Around Us** To identify technology • I can explain technology as something that helps us • I can locate examples of technology in the classroom • I can explain how these technology examples help us To identify a computer and its main parts • I can name the main parts of a computer • I can switch on and log into a computer • I can use a mouse to click and drag		**Programming – Moving a Robot** To explain what a given command will do • I can predict the outcome of a command on a device • I can match a command to an outcome • I can run a command on a device To act out a given word • I can follow an instruction • I can recall words that can be acted out • I can give directions		**Creative Media – Digital Writing** To use a computer to write • I can open a word processor • I can recognise keys on a keyboard • I can identify and find keys on a keyboard To add and remove text on a computer • I can enter text into a computer • I can use letter, number, and Space keys • I can use Backspace to remove text	

	To use a mouse in different ways • I can use a mouse to open a program • I can click and drag to make objects on a screen • I can use a mouse to create a picture To use a keyboard to type on a computer • I can say what a keyboard is for • I can type my name on a computer • I can save my work to a file To use the keyboard to edit text • I can open my work from a file • I can use the arrow keys to move the cursor • I can delete letters To create rules for using technology responsibly • I can identify rules to keep us safe and healthy when we are using		To combine 'forwards' and 'backwards' commands to make a sequence • I can compare forward and backward movements • I can start a sequence from the same place • I can predict the outcome of a sequence involving 'forwards' and 'backwards' commands To combine four direction commands to make sequences • I can compare left and right turns • I can experiment with 'turn' and 'move' commands to move a robot • I can predict the outcome of a sequence involving up to four commands To plan a simple program • I can explain what my program should do • I can choose the order of commands in a sequence		To identify that the look of text can be changed on a computer • I can type capital letters • I can explain what the keys that I have already learnt about do • I can identify the toolbar and use bold, italic, and underline To make careful choices when changing text • I can select a word by double-clicking • I can select all of the text by clicking and dragging • I can change the font To explain why I used the tools that I chose • I can say what tool I used to change the text • I can decide if my changes have improved my writing • I can use 'Undo' to remove changes	

	technology in and beyond the home • I can give examples of some of these rules • I can discuss how we benefit from these rules		• I can debug my program To find more than one solution to a problem • I can identify several possible solutions • I can plan two programs • I can use two different programs to get to the same place		To compare typing on a computer to writing on paper • I can make changes to text on a computer • I can explain the differences between typing and writing • I can say why I prefer typing or writing	
	National Curriculum Objectives Recognise common uses of information technology beyond school (Technology Around Us; Moving a Robot) Use technology purposefully to create, organise, store, manipulate, and retrieve digital content (Technology Around Us; Digital Writing) Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies. (Technology Around Us; Digital Writing) Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions (Moving a Robot) Create and debug simple programs (Moving a Robot) Use logical reasoning to predict the behaviour of simple programs (Moving a Robot)					
Year			**Digital Photography**		**Programming Quizzes**	

2	**Information Technology Around Us** To recognise the uses and features of information technology • I can identify examples of computers • I can describe some uses of computers • I can identify that a computer is a part of IT To identify the uses of information technology in the school • I can identify examples of IT • I can sort school IT by what it's used for • I can identify that some IT can be used in more than one way To identify information technology beyond school • I can find examples of information technology • I can sort IT by where it is found • I can talk about uses of		To use a digital device to take a photograph • I can recognise what devices can be used to take photographs • I can talk about how to take a photograph • I can explain what I did to capture a digital photo To make choices when taking a photograph • I can explain the process of taking a good photograph • I can take photos in both landscape and portrait format • I can explain why a photo looks better in portrait or landscape format To describe what makes a good photograph • I can identify what is wrong with a photograph • I can discuss how to take a good photograph • I can improve a photograph by retaking it		To explain that a sequence of commands has a start • I can identify the start of a sequence • I can identify that a program needs to be started • I can show how to run my program To explain that a sequence of commands has an outcome • I can predict the outcome of a sequence of commands • I can match two sequences with the same outcome • I can change the outcome of a sequence of commands To create a program using a given design • I can work out the actions of a sprite in an algorithm • I can decide which blocks to use to meet the design • I can build the sequences of blocks I need	

	information technology To explain how information technology helps us • I can recognise common types of technology • I can demonstrate how IT devices work together • I can say why we use IT To explain how to use information technology safely • I can list different uses of information technology • I can talk about different rules for using IT • I can say how rules can help keep me safe To recognise that choices are made when using information technology • I can identify the choices that I make when using IT • I can use IT for different types of activities		To decide how photographs can be improved • I can explore the effect that light has on a photo • I can experiment with different light sources • I can explain why a picture may be unclear To use tools to change an image • I can recognise that images can be changed • I can use a tool to achieve a desired effect • I can explain my choices To recognise that photos can be changed • I can apply a range of photography skills to capture a photo • I can recognise which photos have been changed • I can identify which photos are real and which have been changed		To change a given design • I can choose backgrounds for the design • I can choose characters for the design • I can create a program based on the new design To create a program using my own design • I can choose the images for my own design • I can create an algorithm • I can build sequences of blocks to match my design To decide how my project can be improved • I can compare my project to my design • I can improve my project by adding features • I can debug my program	

	• I can explain the need to use IT in different ways					

National Curriculum Objectives

- Use technology purposefully to create, organise, store, manipulate, and retrieve digital content (Information Technology Around Us; Digital Photography; Programming Quizzes)
- Recognise common uses of information technology beyond school (Information Technology Around Us; Digital Photography)
- Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies (Information Technology Around Us; Digital Photography)
- Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions (Programming Quizzes)
- Create and debug simple programs (Programming Quizzes)
- Use logical reasoning to predict the behaviour of simple programs (Programming Quizzes)

Year 3	**Connecting Computers**				**Stop-Frame Animation**	

	To explain how digital devices function • I can explain that digital devices accept inputs • I can explain that digital devices produce outputs • I can follow a process To identify input and output devices • I can classify input and output devices • I can describe a simple process • I can design a digital device To recognise how digital devices can change the way that we work • I can explain how I use digital devices for different activities • I can recognise similarities between using digital devices and using non-digital tools • I can suggest differences between using digital devices		**Events and Actions in Programs** To explain how a sprite moves in an existing project • I can explain the relationship between an event and an action • I can choose which keys to use for actions and explain my choices • I can identify a way to improve a program To create a program to move a sprite in four directions • I can choose a character for my project • I can choose a suitable size for a character in a maze • I can program movement To adapt a program to a new context • I can use a programming extension • I can consider the real world when making design choices		To explain that animation is a sequence of drawings or photographs • I can draw a sequence of pictures • I can create an effective flip book—style animation • I can explain how an animation/flip book works To relate animated movement with a sequence of images • I can predict what an animation will look like • I can explain why little changes are needed for each frame • I can create an effective stop-frame animation To plan an animation • I can break down a story into settings, characters and events • I can describe an animation that is achievable on screen • I can create a storyboard To identify the need to work consistently and carefully • I can use onion skinning to help me	

	and using non-digital tools To explain how a computer network can be used to share information • I can recognise different connections • I can explain how messages are passed through multiple connections • I can discuss why we need a network switch To explore how digital devices can be connected • I can recognise that a computer network is made up of a number of devices • I can demonstrate how information can be passed between devices • I can explain the role of a switch, server, and wireless access point in a network To recognise the physical components of a network • I can identify how devices in a		• I can choose blocks to set up my program To develop my program by adding features • I can identify additional features (from a given set of blocks) • I can choose suitable keys to turn on additional features • I can build more sequences of commands to make my design work To identify and fix bugs in a program • I can test a program against a given design • I can match a piece of code to an outcome • I can modify a program using a design To design and create a maze-based challenge • I can make design choices and justify them • I can implement my design		make small changes between frames • I can review a sequence of frames to check my work • I can evaluate the quality of my animation To review and improve an animation • I can explain ways to make my animation better • I can evaluate another learner's animation • I can improve my animation based on feedback To evaluate the impact of adding other media to an animation • I can add other media to my animation • I can explain why I added other media to my animation • I can evaluate my final film	

	network are connected together • I can identify networked devices around me • I can identify the benefits of computer networks		• I can evaluate my project			

National Curriculum Objectives

- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information (Connecting Computers; Events and Actions; Stop-Frame Animation)
- Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. (Stop-Frame Animation)

- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts (Events and Actions)
- Use sequence, selection, and repetition in programs; work with variables and various forms of input and output (Connecting Computers; Events and Actions)
- Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs (Events and Actions)
- Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web; and the opportunities they offer for communication and collaboration (Connecting Computers)

Year 4	**The Internet**					

	To describe how networks physically connect to other networks • I can describe the internet as a network of networks • I can demonstrate how information is shared across the internet • I can discuss why a network needs protecting To recognise how networked devices make up the internet • I can describe networked devices and how they connect • I can explain that the internet is used to provide many services • I can recognise that the World Wide Web contains websites and web pages To outline how websites can be shared via the World Wide Web (WWW) • I can explain the types of media that can be		**Audio Production** To identify that sound can be recorded • I can identify the input and output devices used to record and play sound • I can use a computer to record audio • I can explain that the person who records the sound can say who is allowed to use it To explain that audio recordings can be edited • I can re-record my voice to improve my recording • I can inspect the soundwave view to know where to trim my recording • I can discuss what sounds can be added to a podcast To recognise the different parts of creating a podcast project • I can explain how sounds can be combined to make a podcast more engaging		**Repetition in Games** To develop the use of count-controlled loops in a different programming environment • I can list an everyday task as a set of instructions including repetition • I can predict the outcome of a snippet of code • I can modify a snippet of code to create a given outcome To explain that in programming there are infinite loops and count-controlled loops • I can modify loops to produce a given outcome • I can choose when to use a count-controlled and an infinite loop • I can recognise that some programming languages enable more than one process to be run at once	

	shared on the WWW • I can describe where websites are stored when uploaded to the WWW • I can describe how to access websites on the WWW To describe how content can be added and accessed on the World Wide Web (WWW) • I can explain what media can be found on websites • I can recognise that I can add content to the WWW • I can explain that internet services can be used to create content online To recognise how the content of the WWW is created by people • I can explain that websites and their content are created by people • I can suggest who owns the content on websites		• I can save my project so the different parts remain editable • I can plan appropriate content for a podcast To apply audio editing skills independently • I can record content following my plan • I can review the quality of my recordings • I can improve my voice recordings To combine audio to enhance my podcast project • I can open my project to continue working on it • I can arrange multiple sounds to create the effect I want • I can explain the difference between saving a project and exporting an audio file To evaluate the effective use of audio		To develop a design that includes two or more loops which run at the same time • I can choose which action will be repeated for each object • I can explain what the outcome of the repeated action should be • I can evaluate the effectiveness of the repeated sequences used in my program To modify an infinite loop in a given program • I can identify which parts of a loop can be changed • I can explain the effect of my changes • I can re-use existing code snippets on new sprites To design a project that includes repetition • I can evaluate the use of repetition in a project • I can select key parts of a given	

	• I can explain that there are rules to protect content To evaluate the consequences of unreliable content • I can explain that not everything on the World Wide Web is true • I can explain why some information I find online may not be honest, accurate, or legal • I can explain why I need to think carefully before I share or reshare content		• I can listen to an audio recording to identify its strengths • I can suggest improvements to an audio recording • I can choose appropriate edits to improve my podcast		project to use in my own design • I can develop my own design explaining what my project will do To create a project that includes repetition • I can refine the algorithm in my design • I can build a program that follows my design • I can evaluate the steps I followed when building my project	

	National Curriculum Objectives • Understand computer networks including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration (The Internet) • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content (The Internet; Audio Production) • Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information (The Internet; Audio Production; Repetition in Games) • Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact. (The Internet; Audio Production) • Design, write, and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output • Use logical reasoning to explain how some simple algorithms work, and to detect and correct errors in algorithms and programs					
Year 5	**Systems & Searching**		**Programming – Quizzes**		**Programming - Sensing**	

	To explain that computers can be connected together to form systems • I can explain that systems are built using a number of parts • I can describe the input, process, and output of a digital system • I can explain that computer systems communicate with other devices To recognise the role of computer systems in our lives • I can identify tasks that are managed by computer systems • I can identify the human elements of a computer system • I can explain the benefits of a given computer system To identify how to use a search engine • I can make use of a web search to find specific information		To explain how selection is used in computer programs • I can recall how conditions are used in selection • I can identify conditions in a program • I can modify a condition in a program To relate that a conditional statement connects a condition to an outcome • I can use selection in an infinite loop to check a condition • I can identify the condition and outcomes in an 'if… then… else…' statement • I can create a program that uses selection to produce different outcomes To explain how selection directs the flow of a program • I can explain that program flow can branch according to a condition		To create a program to run on a controllable device • I can apply my knowledge of programming to a new environment • I can test my program on an emulator • I can transfer my program to a controllable device To explain that selection can control the flow of a program • I can identify examples of conditions in the real world • I can use a variable in an if, then, else statement to select the flow of a program • I can determine the flow of a program using selection	

	• I can refine my web search • I can compare results from different search engines To describe how search engines select results • I can explain why we need tools to find things online • I can recognise the role of web crawlers in creating an index • I can relate a search term to the search engine's index To explain how search results are ranked • I can order a list by rank • I can explain that a search engine follows rules to rank results • I can give examples of criteria used by search engines to rank results		• I can design the flow of a program that contains 'if… then… else…' • I can show that a condition can direct program flow in one of two ways To design a program that uses selection • I can outline a given task • I can use a design format to outline my project • I can identify the outcome of user input in an algorithm To create a program that uses selection • I can implement my algorithm to create the first section of my program • I can test my program • I can share my program with others To evaluate my program • I can identify ways the program could be improved • I can identify the setup code I need in my program		To update a variable with a user input • I can use a condition to change a variable • I can experiment with different physical inputs • I can explain that checking a variable doesn't change its value To use a conditional statement to compare a variable to a value • I can use an operand (e.g. <>=) in an if, then statement • I can explain the importance of the order of conditions in else, if statements • I can modify a program to achieve a different outcome	

	To recognise why the order of results is important, and to whom • I can describe some of the ways that search results can be influenced • I can recognise some of the limitations of search engines • I can explain how search engines make money		• I can extend my program further		To design a project that uses inputs and outputs on a controllable device • I can decide what variables to include in a project • I can design the algorithm for my project • I can design the program flow for my project To develop a program to use inputs and outputs on a controllable device • I can create a program based on my design • I can test my program against my design I can use a range of approaches to find and fix bugs	

National curriculum objectives

- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts (Physical Computing; Quizzes)
- Use sequence, selection, and repetition in programs; work with variables and various forms of input and output (Physical Computing; Quizzes)
- Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs (Physical Computing; Quizzes)
- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information (Physical Computing; Quizzes)
- Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration (Systems & Searching)
- Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content (Systems & Searching)

Year 6	**Internet Communication** To explain the importance of internet addresses • I can recognise that data is transferred using agreed methods • I can explain that internet devices have addresses • I can describe how computers use addresses to access websites To recognise how data is transferred across the internet • I can identify and explain the main parts of a data packet • I can explain that data is transferred over networks in packets • I can explain that all data transferred over the internet is in packets To explain how sharing information online can help people to work together		**Web Page Creation** To review an existing website and consider its structure • I can explore a website • I can discuss the different types of media used on websites • I know that websites are written in HTML To plan the features of a web page • I can recognise the common features of a web page • I can suggest media to include on my page • I can draw a web page layout that suits my purpose To consider the ownership and use of images (copyright) • I can say why I should use copyright-free images • I can find copyright-free images		**Variables in Games** To define a 'variable' as something that is changeable • I can identify examples of information that is variable • I can explain that the way a variable changes can be defined • I can identify that variables can hold numbers or letters To explain why a variable is used in a program • I can identify a program variable as a placeholder in memory for a single value • I can explain that a variable has a name and a value • I can recognise that the value of a variable can be changed To choose how to improve a game by using variables • I can decide where in a	

	• I can recognise how to access shared files stored online • I can send information over the internet in different ways • I can explain that the internet allows different media to be shared To evaluate different ways of working together online • I can identify different ways of working together online • I can recognise that working together on the internet can be public or private • I can explain how the internet enables effective collaboration To recognise how we communicate using technology • I can explain the different ways in which people communicate • I can identify that there are a variety of ways to		• I can describe what is meant by the term 'fair use' To recognise the need to preview pages • I can add content to my own web page • I can preview what my web page looks like • I can evaluate what my web page looks like on different devices and suggest/make edits. To outline the need for a navigation path • I can explain what a navigation path is • I can describe why navigation paths are useful • I can make multiple web pages and link them using hyperlinks To recognise the implications of linking to content owned by other people • I can explain the implication of linking to content owned by others		program to change a variable • I can make use of an event in a program to set a variable • I can recognise that the value of a variable can be used by a program To design a project that builds on a given example • I can choose the artwork for my project • I can create algorithms for my project • I can explain my design choices To use my design to create a project • I can create the artwork for my project • I can choose a name that identifies the role of a variable • I can test the code that I have written To evaluate my project	

	communicate over the internet • I can choose methods of communication to suit particular purposes To evaluate different methods of online communication • I can compare different methods of communicating on the internet • I can decide when I should and should not share information online • I can explain that communication on the internet may not be private		• I can create hyperlinks to link to other people's work • I can evaluate the user experience of a website		• I can identify ways that my game could be improved • I can use variables to extend my game • I can share my game with others	

National Curriculum Objectives

- Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration (Internet Communication)
- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information (Internet Communication; Web Page Creation; Variables in Games)
- Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact (Internet Communication; Web Page Creation)
- Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content (Web Page Creation)
- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts (Variables in Games)
- Use sequence, selection, and repetition in programs; work with variables and various forms of input and output (Variables in Games)
- Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs (Variables in Games)