



COMPUTING PROGRESSION MAP



Year Group and Topics	Learning Objectives NC-Unit/Scheme Knowledge-Skill Objectives	Key Vocabulary	Assessment of Core Knowledge and Skills/End Goal
Reception			
<u>Autumn</u> Barefoot Computing Units: Awesome Autumn Winter Warmers	- To access and use simple activities using touch technology with increasing control. - To name some uses of ICT beyond school e.g listening to music/watching films	Children begin to be introduced to Year 1 vocabulary	- To make prints or use images provided create repeating patterns. - To predict what comes next in the pattern, complete the pattern and check. - To identify what is repeated in the structure of the pattern to build up a picture of the pattern and refine their understanding based on new information given.
<u>Spring</u> Barefoot Computing Units: Super Space Springtime	- To select and use technology for a particular purpose. - To name a keyboard and mouse and use it with developing control. - To use a digital device to create and store content e.g taking a photo or video.		- To create their own basic algorithms. - To debug their own algorithm. - To work in small groups to plan and test their algorithm.
<u>Summer</u> Barefoot Computing Units: Summer Fun Busy Bodies	- To use a range of control toys and devices. - To understand that goals can be achieved by following a sequence of steps. - To follow symbol sequence algorithms. - To programme a Bee-bot, one instruction at a time. - To recognise that there is a problem and say what the problem is. - To make predictions about what a programme will/won't do.		- To create and move, turn, place and overlap items to create their own object. - To experiment with arranging shapes to create the image. - To find and fix errors in their work. - To demonstrate perseverance by swapping and testing until they achieve the desired outcome.
Year 1			
<u>Autumn</u> Computer Systems and Networks - Technology Around Us Concept: To Connect	<u>KS1 National Curriculum Objectives</u> Recognise common uses of information technology beyond school - To identify technology - To identify a computer and its main parts - To use a mouse in different ways - To use a keyboard to type on a computer - To use the keyboard to edit text - To create rules for using technology responsibly	Technology Computer Mouse Trackpad Keyboard Screen Double-click Typing	- To explain how these technology examples help us - To explain technology as something that helps us - To locate examples of technology in the classroom - To name the main parts of a computer - To switch on and log into a computer - To use a mouse to click and drag - To click and drag to make objects on a screen - To use a mouse to create a picture

			• To use a mouse to open a program • To save my work to a file • To say what a keyboard is for • To my type name on a computer • To delete letters • To open my work from a file • To use the arrow keys to move the cursor • To discuss how we benefit from these rules • To give examples of some of these rules • To identify rules to keep us safe and healthy when we are using technology and beyond the home
Spring Programming - Moving a Robot Concept: To Code	KS1 National Curriculum Objectives Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions Create and debug simple programs Use logical reasoning to predict the behaviour of simple programs • To explain what a given command will do • To act out a given word • To combine forwards and backwards commands to make a sequence • To combine four direction commands to make sequences • To plan a simple program • To find more than one solution to a problem	Forwards Backwards Turn Clear Commands Instructions Directions Algorithm Program Route	• To match a command to an outcome • To predict the outcome of a command on a device • To run a command on a device • To follow an instruction • To give directions • To recall words that can be acted out • To compare forwards and backwards movements • To predict the outcome of a sequence involving forwards and backwards commands • To start a sequence from the same place • To compare left and right turns • To experiment with turn and move commands to move a robot • To predict the outcome of a sequence involving up to four commands • To choose the order of commands in a sequence • To debug my program • To explain what my program should do • To identify several possible solutions • To plan two programs • To use two different programs to get to the same place
Summer Data and Information - Grouping Data Concept: To Collect	KS1 National Curriculum Objectives Use technology purposefully to create, organise, store, manipulate and retrieve digital content • To label objects • To identify that objects can be counted • To describe objects in different ways • To count objects with the same properties • To compare groups of objects • To answer questions about groups of objects	Object Label Group Search Image Property Colour Size Shape Value	• To describe object using labels • To identify the label for a group of objects • To match objects to groups • To count a group of objects • To count objects • To group objects • To describe an object • To describe a property of an object • To find objects with similar properties • To count how many objects share a property

		Label	- To group objects in more than one way - To group similar objects - To choose how to group objects - To describe group of objects - To record how many objects are in a group - To compare groups of objects - To decide how to group objects to answer a question - To record and share what I have found
Year 2			
<u>Autumn</u> Computer Systems and Networks - IT Around Us Concept: To Connect	<u>KS1 National Curriculum Objectives</u> Recognise common uses of information technology beyond school - To recognise the uses and features of information technology - To identify information technology in the school - To identify information technology beyond school - To explain how information technology helps us - To explain how to use information technology safely - To recognise that choices are made when using information technology	Information Technology (IT) Barcode Scanner Scan	- To describe some uses of computers - To identify examples of computers - To identify that a computer is part of IT - To identify examples of IT - To identify that some IT can be used in more than one way - To sort school IT by what it's used for - To find examples of information technology - To sort IT by where it is found - To talk about uses of information technology - To demonstrate how IT devices work together - To recognise common types of technology - To say why we use IT - To list different uses of information technology - To say how rules can help keep me safe - To talk about different rules for using IT - To explain the need to use IT in different ways - To identify the choices that I make when using IT - To use IT for different types of activities
<u>Spring</u> Programming - Robot Algorithms Concept: To Code	<u>KS1 National Curriculum Objectives</u> Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions Create and debug simple programs Use logical reasoning to predict the behaviour of simple programs - To describe a series of instructions as a sequence - To explain what happens when we change the order of instructions - To use logical reasoning to predict the outcome of a program (series of commands) - To explain that programming projects can have code and artwork - To design an algorithm	Sequence Unambiguous Order Prediction Mat Debugging	- To choose a series of words that can be enacted as a sequence - To follow instructions given by someone else - To give clear instructions - To show the difference in outcomes between two sequences that consist of the same commands - To use an algorithm to program a sequence on a floor robot - To use the same instructions to create different algorithms - To compare my prediction to the program outcome - To follow a sequence - To predict the outcome of a sequence - To explain the choices I made for my mat design

	To create and debug a program that the children have written		- To identify different routes around my mat - To test my mat to make sure that it is usable - To create an algorithm to meet my goal - To explain what my algorithm should achieve - To use my algorithm to create a program - To plan algorithms for different parts of a task - To put together the different parts of my program - To test and debug each part of the program
Summer Creating Media - Digital Photography Concept: To Communicate	KS1 National Curriculum Objectives Use technology purposefully to create, organise, store, manipulate and retrieve digital content - To use a digital device to take a photograph - To make choices when taking a photograph - To describe what makes a good photograph - To decide how photographs can be improved - To use tools to change an image - To recognise that photos can be changed	Device Camera Photograph Capture Image Digital Landscape Portrait Framing Flash Focus Background Editing	- To explain what I did to capture a digital photo - To recognise what devices can be used to take photographs - To talk about how to take a photograph - To explain the process of taking a good photograph - To explain why a photo looks better in portrait or landscape format - To take photos in both landscape and portrait format - To discuss how to take a good photograph - To identify what is wrong with a photograph - To improve a photograph by retaking it - To experiment with different light sources - To explain why a picture may be unclear - To explore the effect that light has on a photo - To explain my choices - To recognise that images can be changed - To use a tool to achieve a desired effect - To apply a range of photograph skills to capture a photo - To identify which photos are real and which have been changed - To recognise which photos have been changed
Year 3			
Autumn Computing Systems and Networks - Connecting Computers Concept: To Connect	KS2 National Curriculum Objectives To understand computer networks - To explain how digital devices function - To identify input and output devices - To recognise how digital devices can change the way we work - To explain how a computer network can be used to share information - To explore how digital devices can be connected - To recognise the physical components of a network	Digital device Input Output Process Pictogram Connection Network Network switch Server Wireless	- To explain that digital devices accept inputs - To explain that digital devices produce outputs - To follow a process - To classify input and output devices - To describe a simple process - To design a digital device - To explain how I use digital devices for different activities - To recognise similarities between using digital devices and non-digital tools - To suggest differences between using digital devices and non-digital tools

			● To discuss why we need a network switch ● To explain how messages are passed through multiple connections ● To recognise different connections ● To demonstrate how information can be passed between devices ● To explain the role of a switch, server and wireless access point in a network ● To recognise that a computer network is made up of a number of devices ● To identify how devices in a network are connected together ● To identify networked devices around me ● To identify the benefits of computer networks
Spring Programming - Events and Actions Concept: To Code	KS2 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 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 ● To explain how a sprite moves in an existing project ● To create a program to move a sprite in four directions ● To adapt a program to a new context ● To develop my program by adding features ● To identify and fix bugs in a program ● To design and create a maze based (given) challenge	Database Branching database Attribute Questions Structure Compare Organise Selecting Pictogram	● To choose which keys to use for actions and explain my choices ● To explain the relationship between an event and an action ● To identify a way to improve a program ● To choose a character for my project ● To choose a suitable size for a character in a maze ● To program movement ● To choose blocks to set up my program ● To consider the real world when making design choices ● To use a programming extension ● To build more sequences of commands to make my design work ● To choose suitable keys to turn on additional features ● To identify additional features (from a given set of blocks) ● To match a piece of code to an outcome ● To modify a program using a design ● To test a program against a given design ● To evaluate my project ● To implement my design ● To make design choices and justify them
Summer Data and Information - Branching Databases Concept: To Collect	KS2 National Curriculum Objectives Select, use and combine a variety of software 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 ● To create questions with yes/no answers	Database Branching database Attribute Questions Structure Compare Organise	● To create two groups of objects separated by one attribute ● To investigate questions with yes/no answers ● To make up a yes/no question about a collection of objects ● To arrange objects into a tree structure ● To create a group of objects within an existing group

	● To identify the attributes needed to collect data about an object ● To create a branching database ● To explain why it is helpful for a database to be well structured ● To plan the structure of a branching database ● To independently create an identification tool	Selecting Pictogram	● To select an attribute to separate objects into groups ● To group objects using my own yes/no questions ● To select objects to arrange in a branching database ● To test my branching database to see if it works ● To compare two branching database structures ● To create yes/no questions using given attributes ● To explain that questions need to be ordered carefully to split objects into similarly sized groups ● To create a physical version of a branching database ● To create questions that will enable objects to be uniquely identified ● To independently create questions to use in a branching database ● To create a branching database that reflects my plan ● To suggest real world uses for branching databases ● To work with a partner to test my identification tool
Year 4			
<u>Autumn</u> Computing Systems and Networks - The Internet Concept: To Connect	<u>KS2 National Curriculum Objectives</u> Understand computer networks including the internet; how they can provide multiple services, such as the world wide web ● To describe how networks physically connect to other networks ● To recognise how networked devices make up the internet ● To outline how websites can be shared via the World Wide Web ● To describe how content can be added and accessed on the World Wide Web ● To recognise how the content of the WWW is created by people ● To evaluate the consequences of unreliable content	Internet Router Network security Website Web page Routing Browser World Wide Web	● To demonstrate how information is shared across the internet ● To describe the internet as a network of networks ● To discuss why a network needs protecting ● To describe networked devices and how they connect ● To explain that the internet is used to provide many services ● To recognise that the World Wide Web contains websites and web pages ● To describe how to access websites on the WWW ● To describe where websites are stored when uploaded to the WWW ● To explain the types of media that can be shared on the WWW ● To explain that internet services can be used to create content online ● To explain what media can be found on websites ● To recognise that I can add content to the WWW ● To explain that there are rules to protect content ● To explain that websites and their content are created by people ● To suggest who owns the content on websites ● To explain that not everything on the World Wide Web is true

			● To explain why I need to think carefully before I share or reshare content ● To explain why some information I find online may not be honest, accurate or legal
Spring Programming - Repetition in Games	KS2 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 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 ● To develop the use of count-controlled loops in a different programming environment ● To explain that in programming there are infinite loops and count controlled loops ● To develop a design which includes two or more loops which run at the same time ● To modify an infinite loop in a given program ● To design a project that includes repetition ● To create a project that includes repetition	Scratch Loop Repeat Forever Infinite loop Count-controlled loop Costume Duplicate Evaluate	● To list an everyday task as a set of instructions including repetition ● To modify a snippet of code to create a given outcome ● To predict the outcome of a snippet of code ● To choose when to use a count-controlled and an infinite loop ● To modify loops to produce a given outcome ● To recognise that some programming languages enabled more than one process to be run at once ● To choose which action will be repeated for each object ● To evaluate the effectiveness of the repeated sequences used in my program ● To explain what the outcome of the repeated action should be ● To explain the effect of my changes ● To identify which parts of a loop can be changed ● To re-use existing code snippets on new sprites ● To develop my own design explaining what my project will do ● To evaluate the use of repetition in a project ● To select key parts of a given project to use in my own design ● To build a program that follows my design ● To evaluate the steps I followed when building my project ● To refine the algorithm in my design
Spring Creating Media - Photo Editing Concept: To Communicate	KS2 National Curriculum Objectives Select, use and combine a variety of software 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 ● To explain that the composition of digital images can be changed ● To explain that colours can be changed in digital images ● To explain how cloning can be used in photo editing ● To explain that images can be combined ● To combine images for a purpose ● To evaluate how changes can improve an image	Crop Copyright Composition Rotate Effects Hue/saturation Sepia Vignette Retouch Recolour Sharpen Brighten Fake	● To explain why I might crop an image ● To improve an image by rotating it ● To use photo editing software to crop an image ● To experiment with different colour effects ● To explain that different colour effects make you think and feel different things ● To explain why I chose certain colour effects ● To add to the composition of an image by cloning ● To identify how a photo edit can be improved ● To remove parts of an image using cloning ● To experiment with tools to select and copy part of an image ● To explain why photos might be edited

		Real	- To use a range of tools to copy between images - To choose suitable images for my project - To create a project hat is a combination of other images - To describe the image I want to create - To combine text and my image to complete the project - To review images against a given criteria - To use feedback to guide making changes
Year 5			
<u>Autumn</u> Computing Systems and Networks - Sharing Information Concept: To Connect	<u>KS2 National Curriculum Objectives</u> 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 - To explain that computers can be connected together to form systems - To recognise the role of computer systems in our lives - To experiment with search engines - To describe how search engines select results - To explain how search results are ranked - To recognise why the order of results is important and to whom	System Connection Protocol Address Packet Explore Slide Deck Collaboration	- To describe that a computer system features inputs, processes and outputs - To explain that computer systems communicate with other devices - To explain that systems are built using a number of parts - To explain the benefits of a given computer system - To identify tasks that are managed by computer systems - To identify the human elements of a computer system - To compare results from different search engines - To make use of a web search to find specific information - To refine my web search - To explain why we need tools to find things online - To recognise the role of web crawlers in creating an index - To relate a search term to the search engine's index - To explain that a search engine follows rules to rank results - To give examples of criteria used by search engines to rank results - To order a list by rank - To describe some of the ways that search results can be influenced - To explain how search engines make money - To recognise some of the limitations of search engines
<u>Spring</u> Programming - Selection in Quizzes Concept: To Code	<u>KS2 National Curriculum Objectives</u> 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 algorithm and programs To explain how selection is used in computer programs	Selection Condition True False Outcomes Conditional statement Implement Constructive	- To identify conditions in a program - To modify a condition in a program - To recall how conditions are used in selection - To create a program with different outcomes using selection - To identify the condition and outcomes in an 'if...then...else...' statement - To use selection in an infinite loop to check a condition - To design the flow of a program which contains 'if...then...else...'

	● To relate that a conditional statement connects a condition to an outcome ● To explain how selection directs the flow of a program ● To design a program which uses selection ● To create a program which uses selection ● To evaluate the program		● To explain that program flow can branch according to a condition ● To show that a condition can direct program flow in one of two ways ● To identify the outcome of user input in an algorithm ● To outline a given task ● To use a design format to outline my project ● To implement my algorithm to create the first section of my program ● To share my program with others ● To test my program ● To extend my program further ● To identify the setup code I need in my program ● To identify ways the program could be improved
<u>Summer</u> Data and Information - Flat-File Databases Concept: To Collect	<u>KS2 National Curriculum Objectives</u> Select, use and combine a variety of software on a range of digital devices and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information ● To use a form to record information ● To compare paper and computer-based databases ● To outline how you can answer questions by grouping and the sorting data ● To explain that tools can be used to select data to answer questions ● To explain that computer program can be used to compare data visually ● To use a real-world database to answer questions	Record Field Value Criteria Chart Axis Graph Chart	● To create a database using cards ● To explain how information can be recorded ● To order, sort and group my data cards ● To choose which field to sort data by to answer a given question ● To explain what a field and a record is in a database ● To navigate a flat-file database to compare different views of information ● To combine grouping and sorting to answer specific questions ● To explain that data can be grouped using chosen values ● To group information using a database ● To choose multiple criteria to answer a given question ● To choose which field and value are required to answer a given question ● To outline how 'AND' and 'OR' can be used to refine data selection ● To explain the benefits of using a computer to create charts ● To refine a chart by selecting a particular filter ● To select an appropriate chart to visually compare data ● To ask questions that will need more than one field to answer ● To present my findings to a group ● To refine a search in a real-world context

Year 6

<u>Autumn</u> Computing Systems and Networks - Communication Concept: To Connect	<u>KS2 National Curriculum Objectives</u> Use search engines effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content ● To explain the importance of internet addresses ● To recognise how data is transferred across the internet ● To explain how sharing information online can help people to work together ● To evaluate different ways of working together online ● To recognise how we communicate using technology ● To evaluate different methods of online communication	Search engine Google Bing Yahoo! Swisscows DuckDuckGo Index Crawler Bot Ranking Content Creator Communication Public Private	● To describe how computers use addresses to access websites ● To explain that internet devices have addresses ● To recognise that data is transferred using agreed methods ● To explain that all data transferred over the internet is in packets ● To explain that data is transferred over networks in packets ● To identify and explain the main parts of a data packet ● To explain that the internet allows different media to be shared ● To recognise how to access shared files stored online ● To send information over the internet in different ways ● To explain how the internet enables effective collaboration ● To identify different ways of working together online ● To recognise that working together on the internet can be public or private ● To choose methods of communication to suit particular purposes ● To explain the different ways in which people communicate ● To identify that there are a variety of ways to communicate over the internet ● To compare different methods of communicating on the internet ● To decide when I should and should not share information online ● To explain that communication on the internet may not be private
<u>Spring</u> Programming - Variables in Games	<u>KS2 National Curriculum Objectives</u> Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts	Variable Change Name Value	● To explain that the way a variable changes can be defined ● To identify examples of information that is variable ● To identify that variables can hold numbers or letters ● To explain that a variable has a name and a value

Concept: To Code	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 ● To define a 'variable' as something that is changeable ● To explain why a variable is used in a program ● To choose how to improve a game by using variables ● To design a project that builds on a given example ● To use my design to create a project ● To evaluate the project	Improve Share	● To identify a program variable as a placeholder in memory for a single value ● To recognise that the value of a variable can be changed ● To decide where in a program to change a variable ● To make use of an event in a program to set a variable ● To recognise that the value of a variable can be used by a program ● To choose the artwork for my project ● To create algorithms for my project ● To explain my design choices ● To choose a name that identifies the role of a variable ● To create the artwork for my project ● To test the code that I have written ● To identify ways that my game could be improved ● To share my game with others ● To use variables to extend my game
Spring Creating Media - Web Page Creation Concept: To Communicate	<u>KS2 National Curriculum Objectives</u> 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 ● To review an existing website and consider its structure ● To plan the features of a web page ● To consider the ownership and use of images (copyright) ● To recognise the need to preview pages ● To outline the need for a navigation path ● To recognise the implications of linking to content owned by other people	Web page Hypertext Markup Language (HTML) Logo Fair use Home page Google Sites Breadcrumb trail Hyperlink Subpage Embed	● To discuss the different types of media used on websites ● To explore a website ● To know that websites are written in HTML ● To draw a web page layout that suits my purpose ● To recognise the common features of a web page ● To suggest media to include on my page ● To describe what is meant by the term 'fair use' ● To find copyright-free images ● To say why I should use copyright-free images ● To add content to my own web page ● To evaluate what my web page looks like on different devices and suggest/make edits ● To preview what my web page looks like ● To describe why navigation paths are useful ● To explain what a navigation path is ● To make multiple web pages and link them using hyperlinks ● To create hyperlinks to link to other people's work ● To evaluate the user experience of a website ● To explain the implication of linking to content owned by others