COMPUTING CURRICULUM MAP

Reception	Computing systems & networks Creating Media Programming A Data & information					

	YEAR A			YEAR B		
Key Stage 1	**Autumn**	**Spring**	**Summer**	**Autumn**	**Spring**	**Summer**
	Computing systems & networks Technology Around Us (1.1) **Creating Media** Digital Painting (1.2)	**Creating Media** Digital Writing (1.5) **Creating Media** Digital Photography (2.2)	**Programming A** Moving a Robot (1.3) **Programming A** Robot Algorithms (2.3	**Computing systems & networks** IT Around Us (2.1) **Creating Media** Making Digital Music (2.5)	**Data & information** Grouping Data (1.4) **Data & information** Pictograms (2.4)	**Programming B** Programming Animations (1.6) **Programming B** Programming Quizzes (2.6)

END POINT **Key Stage 1**	- 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 - use technology purposefully to create, organise, store, manipulate and retrieve digital content - recognise common uses of information technology beyond school - 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

Lower Key Stage 2	**Computing systems & networks** The Internet (4.1) **Creating Media** Audio Production (4.2)	**Creating Media** Desktop Publishing (3.5) **Data & information** Data Logging (4.4)	**Creating Media** Photo Editing (4.5) **Programming B** Events and Actions in Programs (3.6)	**Computing systems & networks** Connecting Computers (3.1) **Creating Media** Stop-frame Animation (3.2)	**Programming A** Sequencing Sounds (3.3) **Data & information** Branching Databases (3.4)	**Programming A** Repetition in Shapes (4.3) **Programming B** Repetition In Games (4.6)

END POINT **Lower Key Stage 2**	- 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 - 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 - Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content - 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 - Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

Upper Key Stage 2	**Computing systems & networks** Systems & Searching (5.1) **Creating Media** Vector Graphics (5.5)	**Creating Media** Webpage Creation (6.2) **Data & information** Introduction to Spreadsheets (6.4)	**Programming A** Variables in games (6.3) **Creating Media** Video Production (5.2)	**Programming B** Selection in Quizzes (5.6) **Computing systems & networks** Communication & Collaboration (6.1)	**Creating Media** 3D modelling (6.5) **Programming A** Selection in Physical Computing (5.3)	**Data & information** Flat-file Databases (5.4) **Programming B** Sensing Movement (6.6)
END POINT **Upper Key Stage 2**	- 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 - 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 Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content - 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 - Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contacts					
Future Learning: **KS3**	- design, use and evaluate computational abstractions that model the state and behaviour of real-world problems and physical systems - understand several key algorithms that reflect computational thinking [for example, ones for sorting and searching]; use logical reasoning to compare the utility of alternative algorithms for the same problem - use 2 or more programming languages, at least one of which is textual, to solve a variety of computational problems; make appropriate use of data structures [for example, lists, tables or arrays]; design and develop modular programs that use procedures or functions - understand simple Boolean logic [for example, AND, OR and NOT] and some of its uses in circuits and programming; understand how numbers can be represented in binary, and be able to carry out simple operations on binary numbers [for example, binary addition, and conversion between binary and decimal] - understand the hardware and software components that make up computer systems, and how they communicate with one another and with other systems - understand how instructions are stored and executed within a computer system; understand how data of various types (including text, sounds and pictures) can be represented and manipulated digitally, in the form of binary digits - undertake creative projects that involve selecting, using, and combining multiple applications, preferably across a range of devices, to achieve challenging goals, including collecting and analysing data and meeting the needs of known users - create, reuse, revise and repurpose digital artefacts for a given audience, with attention to trustworthiness, design and usability - understand a range of ways to use technology safely, respectfully, responsibly and securely, including protecting their online identity and privacy; recognise inappropriate content, contact and conduct, and know how to report concerns					

KNOWLEDGE & SKILLS PROGRESSION
Computing systems & networks

Reception	KS1	LKS2	UKS2
• use rules given to me by a trusted adult when I use technology. • use a safe part of the Internet to play and learn • make sure a trusted adult is with me • use a log in to access devices • see information that is put online about me • use devices with other people, talking about what we do I am careful with technology devices. • use apps, games and websites that trusted adults show me • use a device for a limited time • know that information sites such as CBeebies can be used to find information digitally • make decisions about photos that show their learning experiences to a global audience via school social media, Tapestry. Children are supported to show their learning to family beyond school. • explore old technology such as phones, keyboards, old PCs etc. • opportunities to use different technologies such as a printer, photocopier, microwave and a range of computing devices such as ipads, laptops, IWBs. • use Google Earth to explore the world: see photos/visit 3d buildings. Model safe use of 'Youtube' to view videos of places around the globe.	• identify technology • identify a computer and its main parts • use a mouse in different ways • use a keyboard to type on a computer • use the keyboard to edit text • create rules for using technology responsibly • recognise the uses and features of information technology • identify the uses of information technology in the school • identify information technology beyond school • explain how information technology helps us • explain how to use information technology safely • recognise that choices are made when using information technology	• explain how digital devices function • identify input and output devices • recognise how digital devices can change the way that we work • explain how a computer network can be used to share information • explore how digital devices can be connected • recognise the physical components of a network • describe how networks physically connect to other networks • recognise how networked devices make up the internet • outline how websites can be shared via the World Wide Web (WWW) • describe how content can be added and accessed on the World Wide Web (WWW) • recognise how the content of the WWW is created by people • evaluate the consequences of unreliable content	• explain that computers can be connected together to form systems • recognise the role of computer systems in our lives • identify how to use a search engine • describe how search engines select results • explain how search results are ranked • recognise why the order of results is important, and to whom • explain the importance of internet addresses • recognise how data is transferred across the internet • explain how sharing information online can help people to work together • evaluate different ways of working together online • recognise how we communicate using technology • evaluate different methods of online communication

KNOWLEDGE & SKILLS PROGRESSION
Creating Media

Reception	KS1	LKS2	UKS2
• have a variety of experiences to type their name or label images. • opportunities are given to use an ipad/laptop/keyboard/mouse • taught skills to take a photo. • ask permission before taking photos of friends. • children photograph artefacts that are part of learning. These are added to software/apps for labelling. • children record sounds on a walk or during exploration of musical instruments. Actions are imagined around the sound when it is played back. Children record phrases to describe feelings and objects. • children use Paint to make marks and to paint a picture. IWB is used to encourage big arm movements. Paint software used to develop fine motor control.	• describe what different freehand tools do • use the shape tool and the line tools • make careful choices when painting a digital picture • explain why I chose the tools I used • use a computer on my own to paint a picture • compare painting a picture on a computer and on paper • use a computer to write • add and remove text on a computer • identify that the look of text can be changed on a computer • make careful choices when changing text • explain why I used the tools that I chose • compare typing on a computer to writing on paper	• use a digital device to take a photograph • make choices when taking a photograph • describe what makes a good photograph • decide how photographs can be improved • use tools to change an image • recognise that photos can be changed • say how music can make us feel • identify that there are patterns in music • experiment with sound using a computer • use a computer to create a musical pattern • create music for a purpose • review and refine our computer work • identify that sound can be recorded • explain that audio recordings can be edited • recognise the different parts of creating a podcast project • apply audio editing skills independently • combine audio to enhance my podcast project • evaluate the effective use of audio • explain that the composition of digital images can be changed • explain that colours can be changed in digital images • explain how cloning can be used in photo editing • explain that images can be combined • combine images for a purpose • evaluate how changes can improve an image	• explain what makes a video effective • use a digital device to record video • capture video using a range of techniques • create a storyboard • identify that video can be improved through reshooting and editing • consider the impact of the choices made when making and sharing a video • identify that drawing tools can be used to produce different outcomes • create a vector drawing by combining shapes • use tools to achieve a desired effect • recognise that vector drawings consist of layers • group objects to make them easier to work with • apply what I have learned about vector drawings • review an existing website and consider its structure • plan the features of a web page • consider the ownership and use of images (copyright) • recognise the need to preview pages • outline the need for a navigation path • recognise the implications of linking to content owned by other people • recognise that you can work in three dimensions on a computer • identify that digital 3D objects can be modified • recognise that objects can be combined in a 3D model • create a 3D model for a given purpose • plan my own 3D model • create my own digital 3D model

KNOWLEDGE & SKILLS PROGRESSION
Data & information

Reception	KS1	LKS2	UKS2
Children take photos and video to capture learning. They know where it is stored to go back and reflect on their learning. They talk about what they can learn from photos and video online or photos in books. Use a visualiser to examine objects they have collected. Use smart Board to share their learning with others.	• label objects • identify that objects can be counted • describe objects in different ways • count objects with the same properties • compare groups of objects • answer questions about groups of objects • recognise that we can count and compare objects using tally charts • recognise that objects can be represented as pictures • create a pictogram • select objects by attribute and make comparisons • recognise that people can be described by attributes • explain that we can present information using a computer •	• create questions with yes/no answers • identify the attributes needed to collect data about an object • create a branching database • explain why it is helpful for a database to be well structured • plan the structure of a branching database • independently create an identification tool • explain that data gathered over time can be used to answer questions • use a digital device to collect data automatically • explain that a data logger collects 'data points' from sensors over time • recognise how a computer can help us analyse data • identify the data needed to answer questions • use data from sensors to answer questions	• use a form to record information • compare paper and computer-based databases • outline how you can answer questions by grouping and then sorting data • explain that tools can be used to select specific data • explain that computer programs can be used to compare data visually • use a real-world database to answer questions • create a data set in a spreadsheet • build a data set in a spreadsheet • explain that formulas can be used to produce calculated data • apply formulas to data • create a spreadsheet to plan an event • choose suitable ways to present data •

KNOWLEDGE & SKILLS PROGRESSION
Programming A

Reception	KS1	LKS2	UKS2
• explore the buttons of a floor robots and remote-control toys. They are guided to discover ways to make the object move. • follow sets of instructions. • communicate instructions to each other & to supporting adults. • explore apps such as BeeBot to make things happen. • talk about solving problems as they work at the low levels. Children are supported to be willing	• explain what a given command will do • act out a given word • combine 'forwards' and 'backwards' commands to make a sequence • combine four direction commands to make sequences • plan a simple program • find more than one solution to a problem • describe a series of instructions as a sequence • explain what happens when we change the order of instructions	• explore a new programming environment • identify that commands have an outcome • explain that a program has a start • recognise that a sequence of commands can have an order • change the appearance of my project • create a project from a task description • identify that accuracy in programming is important	• control a simple circuit connected to a computer • write a program that includes count-controlled loops • explain that a loop can stop when a condition is met • explain that a loop can be used to repeatedly check whether a condition has been met • design a physical project that includes selection • create a program that controls a physical computing project

to make mistakes and learn from - building the foundations for debugging. • opportunities to build environments for floor robots. work together to navigate the robot or remote-control toy around obstacles. Children count steps and movement of floor robots.	• use logical reasoning to predict the outcome of a program • explain that programming projects can have code and artwork • design an algorithm • create and debug a program that I have written	• create a program in a text-based language • explain what 'repeat' means • modify a count-controlled loop to produce a given outcome • decompose a task into small steps • create a program that uses count-controlled loops to produce a given outcome	• define a 'variable' as something that is changeable • explain why a variable is used in a program • choose how to improve a game by using variables • design a project that builds on a given example • use my design to create a project • evaluate my project

KNOWLEDGE & SKILLS PROGRESSION			
Programming B			
Reception	KS1	LKS2	UKS2
	• choose a command for a given purpose • show that a series of commands can be joined together • identify the effect of changing a value • explain that each sprite has its own instructions • design the parts of a project • use my algorithm to create a program • explain that a sequence of commands has a start • explain that a sequence of commands has an outcome • create a program using a given design • change a given design • create a program using my own design • decide how my project can be improved	• explain how a sprite moves in an existing project • create a program to move a sprite in four directions • adapt a program to a new context • develop my program by adding features • identify and fix bugs in a program • design and create a maze-based challenge • develop the use of count-controlled loops in a different programming environment • explain that in programming there are infinite loops and count-controlled loops • develop a design that includes two or more loops which run at the same time • modify an infinite loop in a given program • design a project that includes repetition • create a project that includes repetition	• explain how selection is used in computer programs • relate that a conditional statement connects a condition to an outcome • explain how selection directs the flow of a program • design a program that uses selection • create a program that uses selection • evaluate my program • create a program to run on a controllable device • explain that selection can control the flow of a program • update a variable with a user input • use an conditional statement to compare a variable to a value • design a project that uses inputs and outputs on a controllable device • develop a program to use inputs and outputs on a controllable device