Computing Knowledge and Progression Map

EYFS

The learning journey for Computing begins in The Early Years when children begin to understand cause and effect and develop and understanding that they can administer an input to a device (such as a toy) and receive a desired outcome. Through continuous provision, child led learning and adult directed activities children in the Early Years will develop their skills and knowledge of Computing. In our Early Years we understand the importance of 'the unique child' and therefore understand that children will take individual journeys to reach these goals. Adults are aware of the journey that children in our Early Years embark on and use assessment of the children and In the moment planning to identify their next steps and ensure progression for each individual child.

By the end of The Early Years children will:

- Use mechanical toys
- Have an understanding cause and effect
- Have an understanding of input and output in the environment
- Use technology purposefully
- Apply knowledge of one device to a new device
- Explore and tinker with devices in order to work out how to work them
- Give simple and concise instructions verbally

Substantive knowledge:

- **Understand** that devices are made from different parts
- **Understand** that their actions cause devices to work
- To **use** devices independently
- **Know** that devices are made up of different parts

Disciplinary Knowledge:

- Can use a device they are well acquainted with
- Can work a wind-up toy

Experiences:

- Explore and take apart different devices
- Have access to the interactive screen
- Have access to iPads

EYFS vocabulary

On Off Switch Backwards Forward Instruction Sound Moving

Buttons Collect Command Computer Count Equipment Keyboard Keys Monitor Mouse Movement Organise Phone Camera Remote

Choices Create Internet information Share Technology Website

	Autumn		Spring		Summer	
Rising 3s			Nursery Rhymes	Where do you like to shop?	Bears, bears, bears!	What lives in the garden?
Nursery	Would you like to snuggle up with a book?	What is your favourite toy?	Nursery Rhymes	Where do you like to shop?	Bears, bears, bears!	What lives in the garden?
	Be interested in how things work	Explore how things work				
Rec	Theme: What makes me special?	Who lives in the woods?	Theme: Do you like gravy on your ice-cream?	Is there room on the bus?	Theme: Who put the colours in the rainbow?	To infinity and beyond!
	Ipads To be able to complete a simple game on the ipad with limited support	Data Handling To be able to count groups of objects To be able to say which group is 'more' and which is 'less'	Online Safety taught through Heart Smart – Too much selfie isn't healthy! To know that I can say 'no' or 'please stop' when someone asks me to do something that makes me feel sad To understand that being unkind online can make you feel angry, upset and sad To be able to name at least one trusted adult who can help them stay safe online	Beebots and early algorithms Introduction of Beebots – understanding arrows and directions	Programming To predict the outcome of a command on a device To be able to run a command on a device (through use of Beebots)	Online safety taught through Kidssafe To understand what 'online' means To understand that I can put information online for others to see To understand that you can use the internet to find things out To identify and name examples of their own personal information
Year 1 / Year 2	CYCLE A					
	Beebots National Curriculum Links:	Creating Media: Digital Imagery	Data Handling: Introduction to Data	Scratch Junior National Curriculum Links:	Stop Motion National Curriculum Links:	International Space Station National Curriculum Links:

	Pupils should be taught to: Use logical reasoning to predict the behaviour of simple programs. Create and debug simple programs. **Substantive knowledge:** To understand the basic functions of a virtual Bee-Bot. To know that you can use a camera/tablet to make simple videos. To know that algorithms move a virtual Bee-Bot accurately to a chosen destination. **Disciplinary Knowledge:** Learning how to explore and tinker with software to find out how it works. Learning how to operate a camera to take photos and videos. Using decomposition to solve unplugged challenges.	**National Curriculum Links:** Pupils should be taught to: Use logical reasoning to predict the behaviour of simple programs. Use technology purposefully to create, organise, store, manipulate and retrieve digital content. **Substantive knowledge:** To understand that holding the camera or device still and considering angles and light are important to take good pictures. To know that you can edit, crop and filter photographs. To know how to search safely for images online. **Disciplinary Knowledge:** Learning how to explore and tinker with hardware to find out how it works. Learning where keys are located on the keyboard. Learning how to operate a camera to take photos and videos.	**National Curriculum Links:** Pupils should be taught to: Use technology purposefully to create, organise, store, manipulate and retrieve digital content **Substantive knowledge:** To know how that charts and pictograms can be created using a computer. To understand that a branching database is a way of classifying a group of objects. To know that computers understand different types of 'input'. **Disciplinary Knowledge:** Learning how to explore and tinker with hardware to find out how it works. Recognising that some devices are input devices and others are output devices. Learning where keys are located on the keyboard. Developing control of the mouse through	Pupils should be taught to: Use logical reasoning to predict the behaviour of simple programs. Create and debug simple programs. **Substantive knowledge:** To know that coding is writing in a special language so that the computer understands what to do. To understand that the character in ScratchJr is controlled by the programming blocks. To know that you can write a program to create a musical instrument or tell a joke. **Disciplinary Knowledge:** Recognising that buttons cause effects and that technology follows instruction Explaining what an algorithm is. Following an algorithm. Creating a clear and precise algorithm.	Pupils should be taught to: 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 **Substantive knowledge:** To understand that an animation is made up of a sequence of photographs. To know that small changes in my frames will create a smoother looking animation. To understand what software creates simple animations and some of its features e.g. onion skinning **Disciplinary Knowledge:** Using greater control when taking photos with cameras, tablets or computers.	Pupils should be taught to: Use technology purposefully to create, organise, store, manipulate and retrieve digital content **Substantive knowledge:** To understand that you can enter simple data into a spreadsheet. To understand what steps you need to take to create an algorithm. To know what data to use to answer certain questions. To know that computers can be used to monitor supplies. **Disciplinary Knowledge:** Developing confidence with the keyboard and the basics of touch typing. Creating and labelling images. Collecting and inputting data into a spreadsheet. Interpreting data from a spreadsheet.

	Using logical reasoning to predict the behaviour of simple programs. Developing the skills associated with sequencing in unplugged activities. Following a basic set of instructions. Assembling instructions into a simple algorithm. Programming a virtual robot to follow a planned route. Learning to debug instructions when things go wrong. Using programming language to explain how a virtual robot works. Learning to debug an algorithm in an unplugged scenario. Taking and editing photographs **Wider Curriculum Links:** English – S&L **Key vocabulary:** Algorithm Artificial intelligence Bee-Bot Clear Code	Developing the skills associated with sequencing in unplugged activities. Using a basic range of tools within graphic editing software. Taking and editing photographs. Developing control of the mouse through dragging, clicking and resizing of images to create different effects. Developing understanding of different software tools. Searching and downloading images from the internet safely. When using the internet to search for images, learning what to do if they come across something online that worries them or makes them feel uncomfortable. **Wider Curriculum Links:** English – reading **Key vocabulary:** Background Blurred Camera Clear	dragging, clicking and resizing of images to create different effects. Developing understanding of different software tools. Recognising devices that are connected to the internet. Understanding that technology can be used to represent data in different ways: pictograms, tables, pie charts, bar charts, block graphs etc. Using data representations to answer questions about data. Using software to explore and create pictograms and branching databases. **Wider Curriculum Links:** Maths – data, number **Key vocabulary:** bar chart Block graph Branching database Categorise Chart Click and drag Compare Count Data Data collection	Learning that programs execute by following precise instructions. Incorporating loops within algorithms. Using logical thinking to explore software, predicting, testing and explaining what it does. Using an algorithm to write a basic computer program. Using loop blocks when programming to repeat an instruction more than once. Using software (and unplugged means) to create story animations. **Wider Curriculum Links:** English – S&L **Key vocabulary:** Algorithm Animation Blocks Bug Button CGI Computer code Code Debug Fluid Icon	Using logical thinking to explore software, predicting, testing and explaining what it does. **Wider Curriculum Links:** Art and Design **Key vocabulary:** Animation Background Decompose Digital device Drawing Flipbook Frames Moving images Object Onion skinning Plan Still images	Learning how computers are used in the wider world **Wider Curriculum Links:** Science – Animals including Humans **Key vocabulary:** Algorithm Astronaut Data Digital Digital content Experiment Galaxy Insulation Interactive map International Space Centre International Space Station Interpret Laboratory Monitor Planet Satellite Sensor Space Temperature Thermometer Water reservoir

	Debug Demonstration Emulator Filming Inputting Instructions Pause Precise Predict Program Tinker Video Video recording Virtual	Crop Delete Device Digital camera Download Drag and drop Edit Editing software Filter Image Import Internet Keyword Online Photograph Resize Save as Screen Search engine Sequence Software Storage space Visual effects	Data record Data representation Edit Input Keyboard Line graph Mouse Information Label Pictogram Pie chart Process Record Resize Sort Table Tally Values	Imitate Instructions Loop 'On tap' Programming Repeat ScratchJR Sequence Sound recording		
Future learning KS2	• 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.
EYFS	**CYCLE B** The learning journey for Computing begins in The Early Years when children begin to understand cause and effect and develop and understanding that they can administer an input to a device (such as a toy) and receive a desired outcome. Through continuous provision, child led learning and adult directed activities children in the Early Years will develop their skills and knowledge of Computing. In our Early Years we understand the importance of 'the unique child' and therefore understand that children will take individual journeys to reach these goals. Adults are aware of the journey that children in our Early Years embark on and use assessment of the children and In the moment planning to identify their next steps and ensure progression for each individual child. By the end of The Early Years children will: • Use mechanical toys • Have an understanding cause and effect • Have an understanding of input and output in the environment • Use technology purposefully • Apply knowledge of one device to a new device • Explore and tinker with devices in order to work out how to work them • Give simple and concise instructions verbally Substantive knowledge: • **Understand** that devices are made from different parts • **Understand** that their actions cause devices to work • To **use** devices independently • **Know** that devices are made up of different parts Disciplinary Knowledge: • Can use a device they are well acquainted with • Can work a wind-up toy Experiences: • Explore and take apart different devices • Have access to the interactive screen • Have access to iPads **EYFS Vocabulary** On Off Switch Backwards Forward Instruction Sound Moving Buttons Collect Command Computer Count Equipment Keyboard Keys Monitor Mouse Movement Organise Phone Camera Remote Choices Create Internet information Share Technology Website

Rising 3s			Do you want to be a superhero?	Do you want to be a real life superhero?	What a wonderful world!	Under the Sea
Nursery	It's good to be me!	Where would you like to go?	Do you want to be a superhero?	Do you want to be a real life superhero?	What a wonderful world!	Under the Sea
Reception	What makes me special?	Who lives in the woods?	Do you like gravy on your ice-cream?	Is there room on the bus?	Who put the colours in the rainbow?	To infinity and beyond!
	Ipads To be able to complete a simple game on the ipad with limited support	**Data Handling** To be able to count groups of objects To be able to say which group is 'more' and which is 'less'	**Online Safety taught through Heart Smart – Too much selfie isn't healthy!** To know that I can say 'no' or 'please stop' when someone asks me to do something that makes me feel sad To understand that being unkind online can make you feel angry, upset and sad To be able to name at least one trusted adult who can help them stay safe online	**Beebots and early algorithms** Introduction of Beebots – understanding arrows and directions	**Programming** To predict the outcome of a command on a device To be able to run a command on a device (through use of Beebots)	**Online safety taught through Kidssafe** To understand what 'online' means To understand that I can put information online for others to see To understand that you can use the internet to find things out To identify and name examples of their own personal information

Year 1 / Year 2	**Computer Systems and Networks: Improving Mouse Skills** **National Curriculum Links:** Pupils should be taught to: 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 **Substantive knowledge:** To know that: - "log in" and "log out" means to begin and end a connection with a computer - A computer and mouse can be used to click, drag, fill and select and also add backgrounds, text, layers, shapes and clip art. - Passwords are important for security and to keep us safe.	**Algorithms Unplugged** **National Curriculum Links:** Pupils should be taught to: 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 **Substantive knowledge:** To understand that an algorithm is when instructions are put in an exact order. To understand that decomposition means breaking a problem into manageable chunks and that it is important in computing. To understand that decomposition means breaking a problem into	**Skills Showcase: Rocket to the Moon** **National Curriculum Links:** Pupils should be taught to: Use technology purposefully to create, organise, store, manipulate and retrieve digital content. **Substantive knowledge:** To know that when we create something on a computer it can be more easily saved and shared than a paper version. To know some of the simple graphic design features of a piece of online software. To know that a spreadsheet is an electronic 'table' for sorting data. **Disciplinary Knowledge:** Learning where keys are located on the keyboard. Learning how to operate a camera to take photos and videos.	**What is a computer?** **National Curriculum Links:** Pupils should be taught to: Recognise common uses of information technology beyond school Use technology purposefully to create, organise, store, manipulate and retrieve digital content **Substantive knowledge:** To know the difference between a desktop and laptop computer. To know that people control technology. To know some input devices that give a computer an instruction about what to do (output). To know that computers often work together. **Disciplinary Knowledge:** Understanding what a computer is and that it's made up of different components.	**Programming: Algorithms and Debugging** **National Curriculum Links:** Pupils should be taught to: 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 **Substantive Knowledge:** To understand what machine learning is and how it enables computers to make predictions. To know that loops in programming are where you set a certain instruction (or instructions) to be repeated multiple times. To know that abstraction is the removing of unnecessary detail to help solve a problem. **Disciplinary Knowledge:**	**Computer Systems and Networks: Word Processing** **National Curriculum Links:** Pupils should be taught to: Use technology purposefully to create, organise, store, manipulate and retrieve digital content. Use technology safely and respectfully, keeping personal information private. **Substantive Knowledge:** To know that touch typing is the fastest way to type. To know that I can make text a different style, size and colour. To know that "copy and paste" is a quick way of duplicating text. **Disciplinary Knowledge:** Developing confidence with the keyboard and the basics of touch typing. Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts. Using word processing software to type and reformat text.

	Disciplinary Knowledge: Learning how to explore and tinker with hardware to find out how it works. Learning where keys are located on the keyboard. Using a basic range of tools within graphic editing software. Developing control of the mouse through dragging, clicking and resizing of images to create different effects. Developing understanding of different software tools. Recognising devices that are connected to the internet. Logging in and out and saving work on their own account. **Wider Curriculum Links:** English Art and Design **Key vocabulary:** Log in Login Log out / off	manageable chunks and that it is important in computing. To know that we call errors in an algorithm 'bugs' and fixing these 'debugging'. **Disciplinary Knowledge:** Recognising that some devices are input devices and others are output devices. Learning that decomposition means breaking a problem down into smaller parts. Using decomposition to solve unplugged challenges. Developing the skills associated with sequencing in unplugged activities. Following a basic set of instructions. Assembling instructions into a simple algorithm. Learning to debug instructions when things go wrong.	Using logical reasoning to predict the behaviour of simple programs. Developing the skills associated with sequencing in unplugged activities. Following a basic set of instructions. Assembling instructions into a simple algorithm. Learning to debug instructions when things go wrong. Learning to debug an algorithm in an unplugged scenario. Using a basic range of tools within graphic editing software. Taking and editing photographs. Developing control of the mouse through dragging, clicking and resizing of images to create different effects. Developing understanding of different software tools. Recognising devices that are connected to the internet. Understanding that technology can be used to represent data in different	Recognising that buttons cause effects and that technology follows instructions. Learning how we know that technology is doing what we want it to do via its output. Using greater control when taking photos with cameras, tablets or computers. Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts. Using word processing software to type and reformat text. Creating and labelling images. Learning how computers are used in the wider world **Wider Curriculum Links:** English – S&L Design Technology **Key vocabulary:** Battery Buttons Camera Computer Desktop	Developing confidence with the keyboard and the basics of touch typing. Articulating what decomposition is. Decomposing a game to predict the algorithms used to create it. Learning that there are different levels of abstraction. Explaining what an algorithm is. Following an algorithm. Creating a clear and precise algorithm. Learning that programs execute by following precise instructions. Incorporating loops within algorithms. Using logical thinking to explore software, predicting, testing and explaining what it does. Using an algorithm to write a basic computer program. Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts. **Wider Curriculum Links:** Geography – maps	Searching for appropriate images to use in a document. Understanding what online information is. Identifying whether information is safe or unsafe to be shared online. **Wider Curriculum Links:** English – poetry, newspaper reports **Key Vocabulary:** Backspace Bold Copy Copyright Cut Delete Forward button Highlight Home row Home screen Image Import Italics Keyboard Keyboard character Keyboard shortcut Keyword Layout Navigate Paste Redo Search Space bar Text effects Touch typing Underline

	Mouse Mouse pointer Click Keyboard Screen Password Account Software Duplicate Ctrl Tools Right click Menu Layers Username Drag Drag and drop Digital photograph Undo Cursor	Learning to debug an algorithm in an unplugged scenario. **Wider Curriculum Links:** English **Key vocabulary:** Algorithm Automatic Bug Chunks Clear Code Debug Decompose Decomposition Device Directions Input Instructions Manageable Motion Order Organise Output Precise Programming Problem Robot Sensor Sequence Solution Substantive Steps Tasks	ways: pictograms, tables, pie charts, bar charts, block graphs etc. Logging in and out and saving work on their own account. **Wider Curriculum Links:** Science – Everyday Materials **Key vocabulary:** Annotate Cells Components Create Data Debug Designing Digital content Digital image Document E-document Edit Editing program Evaluate Folder Input Instructions Log in Photo Program Order	Device Digital Digital recorder Electricity Function Input Invention Keyboard Laptop Monitor Mouse Output Paying till Scanner Screen System Tablet Technology Video Wires	**Key Vocabulary:** Abstraction Algorithm Artificial intelligence Bug Clear Correct Data Debug Decompose Error Key features Loop Predict Unnecessary	

			Robot Save Sequence Share Software Spreadsheet Table			
Future learning KS2	• 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					