		Computing – Learning Progression of Skills						
Key Area (NC subject content)		**EYFS**	**Y1**	**Y2**	**Y3**	**Y4**	**Y5**	**Y6**
Computer Science	Hardware	Learning how to operate a camera to take photographs of meaning creations or moments. Learning how to explore and tinker with hardware to develop familiarity and introduce relevant vocabulary. Recognising familiar letters and numbers on a keyboard. Developing basic mouse skills such as moving and clicking.	Learning how to operate a camera or tablet to take photos and videos. 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. Understanding what a computer is and that it's made up of different components. Learning how we know that technology is doing what we want it to do via its output. Developing confidence with the keyboard and the basics of touch typing. Recognising that buttons cause effects and that technology follows instructions. Using greater control when taking photos with cameras, tablets or computers. Learning how to operate a camera or tablet to take photos and videos. 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. Recognising that buttons cause effects and that technology follows instructions. Using greater control when taking photos with cameras, tablets or computers		Understanding what the different components of a computer do and how they work together. Drawing comparisons across different types of computers. Learning about the purpose of routers. Using tablets or digital cameras to film a weather forecast. Understanding that weather stations use sensors to gather and record data which predicts the weather.		Learning that external devices can be programmed by a separate computer. Learning the difference between ROM and RAM. Recognising how the size of RAM affects the processing of data. Understanding the fetch, decode, execute cycle. Learning about the history of computers and how they have evolved over time. Using the understanding of historic computers to design a computer of the future. Understanding and identifying barcodes, QR codes and RFID. Identifying devices and applications that can scan or read barcodes, QR codes and RFID. Understanding how corruption can happen within data during transfer (for example when downloading, installing, copying and updating files).	

	Networks and data representation	N/A	N/A	N/A	Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration. Understanding the role of the key components of a network. Identifying the key components within a network, including whether they are wired or wireless. Understanding that websites and videos are files that are shared from one computer to another. Learning about the role of packets. Understanding how networks work and their purpose. Recognising links between networks and the internet. Learning how data is transferred.	Learning the vocabulary associated with data: data and transmit. Learning how the data for digital images can be compressed. Recognising that computers transfer data in binary and understanding simple binary addition. Relating binary signals (Boolean) to the simple character-based language, ASCII. Learning that messages can be sent by binary code, reading binary up to eight characters and carrying out binary calculations. Understanding how bit patterns represent images as pixels.
	Computational thinking	Using logical reasoning to understand simple instructions and predict the outcome.	Learning that decomposition means breaking a problem down into smaller parts and articulating this. Using decomposition to solve unplugged challenges. 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. Explaining what an algorithm is. Following an algorithm.		Using decomposition to explore the code behind an animation. Using repetition in programs. Using logical reasoning to explain how simple algorithms work. Explaining the purpose of an algorithm. Forming algorithms independently. Using decomposition to solve a problem by finding out what code was used. Using decomposition to understand the purpose of a script of code. Identifying patterns through unplugged activities.	Decomposing a program without support. Predicting how software will work based on previous experience. Using past experiences to help solve new problems. Writing increasingly complex algorithms for a purpose. Decomposing a program into an algorithm. Decomposing animations into a series of images. Decomposing a story to be able to plan a program to tell a story.

			Creating a clear and precise algorithm. Learning that programs execute by following precise instructions. Incorporating loops within algorithms. Decomposing a game to predict the algorithms used to create it. Learning that there are different levels of abstraction. Using decomposition to solve unplugged challenges. 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. 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 past experiences to help solve new problems. Using abstraction to identify the important parts during both plugged and unplugged activities. Using decomposition to explain the parts of a laptop computer. Explaining the purpose of an algorithm.	Predicting how software will work based on previous experience. Writing increasingly complex algorithms for a purpose.
	Programming	Following instructions as part of practical activities and games. Learning to give simple instructions.	Learning to debug instructions when things go wrong. Learning to debug an algorithm in an unplugged scenario.	Using logical thinking to explore more complex software; predicting, testing and explaining what it does. Incorporating loops to make code more efficient.	Programming an animation. Iterating and developing their programming as they work. Confidently using loops in programming.

		Experimenting with programming a Bee-bot/Blue- bot and learning how to give simple commands. Learning to debug instructions, with the help of an adult, when things go wrong.	Using logical thinking to explore software, predicting, testing and explaining what it does. Using an algorithm to write a basic computer program. Programming a Floor robot to follow a planned route. Using programming language to explain how a floor robot works. 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. Learning to debug instructions when things go wrong. Learning to debug an algorithm in an unplugged scenario.	Continuing existing code. Making reasonable suggestions for how to debug their own and others' code. Creating algorithms for a specific purpose. Coding a simple game. Using abstraction and pattern recognition to modify code. Incorporating variables to make code more efficient. Remixing existing code. Using logical thinking to explore more complex software; predicting, testing and explaining what it does.	Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected. Writing code to create a desired effect. Using a range of programming commands. Using repetition within a program. Predicting code and adapting it to a chosen purpose. Changing a program to personalise it. Evaluating code to understand its purpose. Debugging quickly and effectively to make a program more efficient. Remixing existing code to explore a problem. Debugging quickly and effectively to make a program more efficient. Remixing existing code to explore a problem. Using and adapting nested loops. Programming using the language Python. Changing a program to personalise it. Evaluating code to understand its purpose. Amending code within a live scenario. Iterating and developing their programming as they work. Confidently using loops in programming.

					Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected. Writing code to create a desired effect. Using a range of programming commands. Using repetition within a program.

	Using software	Using a simple online paint tool to create digital art.	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. 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. 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. Using software (and unplugged means) to create story animations. Creating and labelling images.	Taking photographs and recording video to tell a story. Using software to edit and enhance their video adding music, sounds and text on screen with transitions. Designing and creating a webpage for a given purpose. Building a web page and creating content for it. Using software to work collaboratively with others. Building a web page and creating content for it. Use online software for documents, presentations, forms and spreadsheets. Using software to work collaboratively with others.	Using logical thinking to explore software more independently, making predictions based on their previous experience, iterating ideas and testing continuously. Identify ways to improve and edit programs, videos, images etc. Using search and word processing skills to create a presentation. Independently learning how to use 3D design software package TinkerCAD. Creating and editing sound recordings for a specific purpose. Creating and editing videos, adding multiple elements: music, voiceover, sound, text and transitions. Using design software TinkerCAD to design a product. Creating a website with embedded links and multiple pages. Using logical thinking to explore software more independently, making predictions based on their previous experience, iterating ideas and testing continuously. Identify ways to improve and edit programs, videos, images etc. Using search and word processing skills to create a presentation. Using software programme Sonic Pi/Scratch to create music. Using video editing software to animate.

	Using email and internet searches		Recognising devices that are connected to the internet. Understanding that we are connected to others when using the internet. Searching for appropriate images to use in a document. Understanding what online information is. Searching and downloading images from the internet safely. Recognising devices that are connected to the internet. Understanding that we are connected to others when using the internet.	Learning to log in and out of an email account. Writing an email including a subject, 'to' and 'from.' Sending an email with an attachment. Replying to an email. Understanding why some results come before others when searching. Using keywords to effectively search for information on the internet. Understanding that information found by searching the internet is not all grounded in fact. Searching the internet for data.	Understanding how search engines work. Developing searching skills to help find relevant information on the internet. Learning how to use search engines effectively to find information, focussing on keyword searches and evaluating search returns.
	Using data	Representing data through sorting and categorising objects in unplugged scenarios. Representing data through physical pictograms. Exploring branch databases through physical games.	Understanding that technology can be used to represent data in different ways: pictograms, tables, pie charts, bar charts, block graphs etc. Understanding that technology can be used to represent data in different ways: pictograms, tables, pie charts, bar charts, block graphs etc. Collecting and inputting data into a spreadsheet. Interpreting data from a spreadsheet. Using representations to answer questions about data. Using software to explore and create pictograms and branching databases	Understanding the vocabulary associated with databases: field, record, data. Learning about the pros and cons of digital versus paper databases. Sorting and filtering databases to easily retrieve information. Creating and interpreting charts and graphs to understand data. Understanding that data is used to forecast weather. Recording data in a spreadsheet independently. Sorting data in a spreadsheet to compare using the 'sort by...' option. Designing a device which gathers and records sensor data.	Understanding how data is collected in remote or dangerous places. Understanding how data might be used to tell us about a location. Understanding how barcodes, QR codes and RFID work. Gathering and analysing data in real time. Creating formulas and sorting data within spreadsheets.

	Wider use of technology	N/A	Recognising common uses of information technology, including beyond school. Understanding some of the ways we can use the internet. Learning how computers are used in the wider world. Learning how computers are used in the wider world.	Understanding the purpose of emails. Recognising how social media platforms are used to interact. Understanding that software can be used collaboratively online to work as a team.	Learn about different forms of communication that have developed with the use of technology. Learning about the Internet of Things and how it has led to 'big data'. Learning how 'big data' can be used to solve a problem or improve efficiency. Learn about different forms of communication that have developed with the use of technology.

Information Technology	Using software	Using a simple online paint tool to create digital art.	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. 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. Searching and downloading images from the internet safely. Recognising devices that are connected to the internet. Understanding that we are connected to others when using the internet.	Taking photographs and recording video to tell a story. Using software to edit and enhance their video adding music, sounds and text on screen with transitions. Designing and creating a webpage for a given purpose. Building a web page and creating content for it. Using software to work collaboratively with others. Building a web page and creating content for it. Use online software for documents, presentations, forms and spreadsheets. Using software to work collaboratively with others.	Using logical thinking to explore software more independently, making predictions based on their previous experience, iterating ideas and testing continuously. Identify ways to improve and edit programs, videos, images etc. Using search and word processing skills to create a presentation. Independently learning how to use 3D design software package TinkerCAD. Creating and editing sound recordings for a specific purpose. Creating and editing videos, adding multiple elements: music, voiceover, sound, text and transitions. Using design software TinkerCAD to design a product. Creating a website with embedded links and multiple pages. Using logical thinking to explore software more independently, making predictions based on their previous experience, iterating ideas and testing continuously. Identify ways to improve and edit programs, videos, images etc. Using search and word processing skills to create a presentation. Using software programme Sonic Pi/Scratch to create music. Using video editing software to animate.

	Using email and internet searches		Recognising devices that are connected to the internet. Understanding that we are connected to others when using the internet. Searching for appropriate images to use in a document. Understanding what online information is.	Learning to log in and out of an email account. Writing an email including a subject, 'to' and 'from.' Sending an email with an attachment. Replying to an email. Understanding why some results come before others when searching. Using keywords to effectively search for information on the internet. Understanding that information found by searching the internet is not all grounded in fact.	Developing searching skills to help find relevant information on the internet. Learning how to use search engines effectively to find information, focussing on keyword searches and evaluating search returns.
	Using data	Representing data through sorting and categorising objects in unplugged scenarios. Representing data through physical pictograms. Exploring branch databases through physical games.	Understanding that technology can be used to represent data in different ways: pictograms, tables, pie charts, bar charts, block graphs etc. Understanding that technology can be used to represent data in different ways: pictograms, tables, pie charts, bar charts, block graphs etc. Collecting and inputting data into a spreadsheet. Interpreting data from a spreadsheet. Using representations to answer questions about data. Using software to explore and create pictograms and branching databases	Understanding the vocabulary associated with databases: field, record, data. Learning about the pros and cons of digital versus paper databases. Sorting and filtering databases to easily retrieve information. Creating and interpreting charts and graphs to understand data. Understanding that data is used to forecast weather. Recording data in a spreadsheet independently. Sorting data in a spreadsheet to compare using the 'sort by...' option.Designing a device which gathers and records sensor data.	Understanding how data is collected in remote or dangerous places.Understanding how data might be used to tell us about a location. Understanding how barcodes, QR codes and RFID work.Gathering and analysing data in real time.Creating formulas and sorting data within spreadsheets.
	Wider use of technology		Recognising common uses of information technology,including beyond school.Understanding some of the ways we can use the internet. Learning how computers are used in the wider world. Learning how computers are used in the wider world.	Understanding the purpose of emails.Recognising how social media platforms are used to interact. Understanding that software can be used collaboratively online to work as a team.	Learn about different forms of communication that have developed with the use of technology. Learning about the Internet of Things and how it has led to 'big data'.Learning how 'big data' can be used to solve a problem or improve efficiency.Learn about different forms of communication that have developed with the use of technology.