Computing Progression of Skills

	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Hardware (Computer Science)	• Learning how to operate a camera to take photographs of meaningful creations or moments • Learning how to explore and tinker with hardware to develop familiarity and introduce relevant vocabulary • Learning how to operate a camera • Recognising that a range of technology is used in places such as homes and schools • Learning what a keyboard is and how to locate relevant keys • Learning what a mouse is and developing basic mouse skills such as moving and clicking	• Learning how to explore and tinker with hardware to find out how it works • Understanding that computers and devices around us use inputs and outputs, identifying some of these • Learning where keys are located on the keyboard • Learning how to operate a camera	Understanding what a computer is and that it's made up of different components • 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 tablets or computers • Developing confidence with the keyboard and the basics of touch typing	Understanding what the different components of a computer do and how they work together • Drawing comparisons across different types of computers • Learning what a server does	Learning about the purpose of routers	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 • Acknowledging that corruption can happen within data during transfer (for example when downloading, installing, copying and updating files)
Networks and Data Representation (Computer Science)		Understanding what the internet is		• Learning what a network is and its purpose • Identifying the key components within a network, including whether they are wired or wireless • Recognising links between networks and the internet • Learning how data is transferred	• Consolidating understanding of the key components of a network • Understanding that websites & videos are files that are shared from one computer to another • Learning about the role of packets • Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration	• 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 8 characters and carrying out binary calculations • Understanding how bit patterns represent images as pixels	Understanding that computer networks provide multiple services
Computational thinking (Computer Science)	Using logical reasoning to read simple instructions and predict the outcome	• Learning that decomposition means breaking a problem down into smaller parts • 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 • Learning that an algorithm is a set of step by step instructions used to carry out a task, in a specific order • Follow a basic set of instructions • Assembling instructions into a simple algorithm	• Articulating what decomposition is • Decomposing a game to predict the algorithms used to create it • Using decomposition to decompose a story into smaller parts • Learning what abstraction is • Learning that there are different levels of abstraction • Explaining what an algorithm is • Following an algorithm • Creating a clear and precise algorithm • Learning that computers use algorithms to make predictions • Learning that programs execute by following precise instructions • Incorporating loops within algorithms	• Using decomposition to explain the parts of a laptop computer • Using decomposition to explore the code behind an animation • Using repetition in programs • Understanding that computers follow instructions • Using an algorithm to explain the roles of different parts of a computer • Using logical reasoning to explain how simple algorithms work • Explaining the purpose of an algorithm • Forming algorithms independently	Solving unplugged problems by decomposing them into smaller parts • Using decomposition to understand the purpose of a script of code • Using decomposition to help solve problems • Identifying patterns through unplugged activities • Using past experiences to help solve new problems • Using abstraction to identify the important parts when completing both plugged and unplugged activities • Creating algorithms for a specific purpose	• Decomposing animations into a series of images • Decomposing a program without support • Decomposing a story to be able to plan a program to tell a story • Predicting how software will work based on previous experience • Writing more complex algorithms for a purpose	• Decomposing a program into an algorithm • Using past experiences to help solve new problems • Writing increasingly complex algorithms for a purpose
Programming (Computer Science)	• Following instructions as part of practical activities and games and learning to debug when things go wrong • Learning to give simple instructions • Learning that an algorithm is a set of instructions to carry out a task, in a specific order • Experimenting with programming a Bee-bot/Bluebot and learning how to give simple commands • Learning to debug instructions, with the help of an adult, when things go wrong	• Programming a Bee-bot/Virtual Bee-bot to follow a planned route • Learning to debug instructions when things go wrong • Developing a howto video to explain how the Bee-bot works. • Learning to debug an algorithm in an unplugged scenario	• Using logical thinking to explore software, predicting, testing and explaining what it does • Using an algorithm to write a basic computer program • Learning what loops are • Incorporating loops to make code more efficient	• Using logical thinking to explore more complex software; predicting, testing and explaining what it does • Incorporating loops to make code more efficient • Remixing existing code • Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected	• Understanding that websites can be altered by exploring the code beneath the site • Coding a simple game • Using abstraction and pattern recognition to modify code • Incorporating variables to make code more efficient • Remixing existing code • Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected	• Programming an animation • Iterating and developing their programming as they work • Beginning to use nested loops (loops within loops) • Debugging their own code • Writing code to create a desired effect • Using a range of programming commands • Using repetition within a program • Amending code within a live scenario	• 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 • Predicting code and adapting it to a chosen purpose • Altering a website's code to create changes
Using Software (Information technology)	Using a simple online paint tool to create digital art	Using a basic range of tools within graphic editing software	Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts	• Taking photographs and recording video to tell a story.	• Building a web page and creating content for it • Designing and creating a webpage for a given purpose	• Using logical thinking to explore software more independently, making predictions based on their previous experience	• Using logical thinking to explore software independently, iterating ideas and testing continuously

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		• Taking and editing photographs • Understanding how to create digital art using an online paint tool • Developing control of the mouse through dragging, clicking and resizing of images to create different effects • Developing understanding of different software tools	• Using word processing software to type and reformat text • Using software to create story animations • Creating and labelling images	• Using software to edit and enhance their video adding music, sounds and text on screen with transitions	• Use Google online software for documents, presentations, forms and spreadsheets. • Work collaboratively with others	• Using a software programme (Sonic Pi or Scratch) to create music • Using video editing software or animation software to animate • Identify ways to improve and edit programs, videos, images etc. • Independently learning how to use 3D design software package TinkerCAD	• Using search and word processing skills to create a presentation • Planning, recording and editing a radio play • Creating and editing sound recordings for a specific purpose • Creating and editing videos, adding multiple elements: music, voiceover, sound, text and transitions to create a video advert • Using design software TinkerCAD to design a product • Creating a website with embedded links and multiple pages
Using email and the internet (Information technology)	• Participating in group image searches, led by the teacher	• Searching and downloading images from the internet safely • Understanding that we are connected to others when using the internet	• Understanding that personal information should not be shared on the internet. • Learning how to be respectful to others when sharing content online.	• 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 • Identifying useful terms and phrases for search engines	Understanding why some results come before others when searching • Understanding that information on the internet is not all grounded in fact	Developing searching skills to help find relevant information on the internet • Understanding how apps can access our personal information and how to alter the permissions	Understanding how search engines work
Using data (Information Technology	Representing data through sorting and categorising objects in unplugged scenarios • Representing data through pictograms • Exploring branch databases through physical games	Introduction to spreadsheets • Representing data in tables, charts and pictograms • Sorting data and creating branching databases • Identifying where digital content can have advantages over paper when storing and manipulating data	Collecting and inputting data into a spreadsheet • Interpreting data	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	Designing a weather station which gathers and records sensor data	Understanding how data is collected	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 (Information 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	Understanding the purpose of emails. • Learning what a search engine is • 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
Digital Literacy	• Recognising that a range of technology is used in places such as homes and schools • Learning to log in and log out • When using the internet alongside an adult, or independently, learning what to do if they come across something that worries them or makes them feel uncomfortable	Logging in and out and saving work on their own account • Understand the importance of a password • 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 • Recognising when someone has been unkind online • Learning some top tips for staying safe online • Understanding how we 'share' information on the internet	Understanding that personal information should not be shared on the internet. • Learning how to be respectful to others when sharing content online.	• Learning to be a responsible digital citizen; understanding their responsibilities to treat others respectfully and recognising when digital behaviour is unkind • Learning about cyberbullying • Learning that not all emails are genuine, recognising when an email might be fake and what to do about it • Learning that not all information on the internet is factual • Understanding who personal information should/ should not be shared with	• Recognising what appropriate behaviour is when collaborating with others online • Recognising that information on the Internet might not be true or correct and that some sources are more trustworthy than others • Learning about different forms of advertising on the internet.	• Learning about how permissions work and how to change them • Identifying possible issues with online communication • Considering the effects of screen-time on physical and mental wellbeing • Learning about online bullying and where to seek advice	Understanding the importance of secure passwords and how to create them, along with two-step authentication • Using search engines safely and effectively • Recognising that updated software can help to prevent data corruption and hacking • Considering their digital footprint and online reputation and future implications they may have • Learning about how to collect evidence and report online bullying concerns