

Computing Curriculum Progression Map



This progression map details the skills and knowledge that children at The Free School Norwich will gain at each stage of the curriculum.

Creative Content							
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Greater Depth
Computers	Digital Painting / Digital Writing	Digital Photography / Digital Music	Stop-Frame Animation / Desktop Publishing	Audio Production / Photo Editing	Video Production / Vector Graphics	Web Page Creation / 3D Modelling	
Learners will create content such as video recordings, stories, and/or draw pictures on screen. They will explore programmable toys.	Learners will explore the world of digital art and its exciting range of creative tools. They will be empowered to create their own paintings, while getting inspiration from a range of other artists. They will consider their preferences when painting with, and without, the use of digital devices. They will further their understanding of how to use a computer to create and change text. Learners will familiarise themselves with typing on a keyboard and begin using tools to change the look of their writing, and then they will consider the differences between using a computer and writing on paper to create text.	Learners will learn to recognise that different devices can be used to capture photographs and will gain experience capturing, editing, and improving photos. They will use this knowledge to recognise that images they see may not be real. Learners will explore how music can make them think and feel. They will make patterns and use those patterns to make music with both percussion instruments and digital tools. They will also create different rhythms and tunes, using the movement of animals for inspiration. Finally, learners will share their creations and compare creating music digitally and non-digitally.	Learners will use a range of techniques to create a stop-frame animation. They will apply these skills to creating a story-based animation and add other types of media to their animation, such as music and text. They will become familiar with the terms 'text' and 'images' and use desktop publishing software, considering choices of font size, colour and type to edit and improve premade documents. They will be introduced to the terms 'templates', 'orientation', and 'placeholders' and begin to understand how these can support them in making their own template for a magazine front cover. They will start to add text and images to create their own pieces of work using desktop publishing software and look at a range of page layouts thinking carefully about the purpose of these.	Learners will identify the input device (microphone) and output devices (speaker or headphones) required to work with sound digitally. They will discuss the ownership of digital audio and the copyright implications of duplicating the work of others. Learners will use Audacity to produce a podcast, which will include editing their work, adding multiple tracks, and opening and saving the audio files. Learners will develop their understanding of how digital images can be changed and edited, and how they can then be resaved and reused. They will consider the impact that editing images can have and evaluate the effectiveness of their choices.	Learners will know how to create short videos in groups. They will be exposed to topic-based language and develop their skills of capturing, editing, and manipulating video. They will learn how to use different drawing tools to help them create images, recognising that images in vector drawings are created using shapes and lines, and each individual element in the drawing is called an object. They will layer their objects and duplicating them to support the creation of more complex pieces of work.	Learners will create websites for a chosen purpose. They will identify what makes a good web page and use this information to design and evaluate their own website. Throughout the process learners pay specific attention to copyright and fair use of media, the aesthetics of the site, and navigation paths. Learners will develop their knowledge and understanding of using a computer to produce 3D models. They will initially familiarise themselves with working in a 3D space, moving, resizing, and duplicating objects. They will then create hollow objects using placeholders and combine multiple objects. Learners will examine the benefits of grouping and ungrouping 3D objects, then go on to plan, develop, and evaluate their own 3D model of a building.	Children may be assessed as being greater depth in this curriculum area if they are able to meet the expected outcomes of the year group above their chronological age securely. Year 6s may be judged as greater depth if they are able to adapt creative content for a specific audience and can apply their learning to real life contexts comprehensively.

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Digital Literacy							
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Greater Depth
Computers	Technology Around Us / Grouping Data	Information Technology Around Us / Pictograms	Connecting Computers / Branching Databases	The Internet / Data-Logging	Systems and Searching / Flat-File Databases	Communication and Collaboration / Spreadsheets	
Learners will know what a computer and peripherals are. They will be taught how to operate simple equipment with support, e.g. by using a remote control or navigating touch-capable technology. They will experiment with technological toys such as cameras and touchscreen devices (mobile phones and tablets). They will use ICT hardware to interact with age-appropriate computer software and develop digital literacy skills by being able to access, understand and interact with a range of technologies. They will use the internet with adult supervision to find and retrieve information of interest to them. They will know how to safely use an iPad, with rules established. They will know to tell an adult if they feel unsure or uncomfortable about any content seen on devices.	Learners will develop their understanding of technology and how it can help them in their everyday lives. They will start to become familiar with the different components of a computer by developing their keyboard and mouse skills. Learners will also consider how to use technology responsibly.	Learners will develop their understanding of what information technology (IT) is and will begin to identify examples. They will discuss where they have seen IT in school and beyond, in settings such as shops, hospitals, and libraries. Learners will then investigate how IT improves our world, and they will learn about the importance of using IT responsibly.	Learners will develop their understanding of digital devices, with an initial focus on inputs, processes, and outputs. They will also compare digital and non-digital devices. Next, learners will be introduced to computer networks, including devices that make up a network's infrastructure, such as wireless access points and switches. Finally, learners will discover the benefits of connecting devices in a network.	Learners will apply their knowledge and understanding of networks to appreciate the internet as a network of networks which need to be kept secure. They will learn that the World Wide Web is part of the internet and will be given opportunities to explore the World Wide Web for themselves in order to learn about who owns content and what they can access, add, and create. Finally, they will evaluate online content to decide how honest, accurate, or reliable it is, and understand the consequences of false information.	Learners develop their understanding of computer systems and how information is transferred between systems and devices. Learners consider small-scale systems as well as large-scale systems. They explain the input, output, and process aspects of a variety of different real-world systems. Learners discover how information is found on the World Wide Web, through learning how search engines work (including how they select and rank results) and what influences searching, and through comparing different search engines.	Learners explore how data is transferred over the internet. Learners initially focus on addressing, before they move on to the makeup and structure of data packets. Learners then look at how the internet facilitates online communication and collaboration; they complete shared projects online and evaluate different methods of communication. Finally, they learn how to communicate responsibly by considering what should and should not be shared on the internet.	Children may be assessed as being greater depth in this curriculum area if they are able to meet the expected outcomes of the year group above their chronological age securely. Year 6s may be judged as greater depth if they are able to show a further understanding of cyber security, knowing in detail different techniques that cybercriminals use to steal data, disrupt systems, and infiltrate networks. They may know methods to protect against these attacks.

Computing Curriculum Progression Map



Problem Solving and Logical Thinking

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Greater Depth
Bee Bots / Story Frames	Moving a Robot / Programming Animations	Robot Algorithms / Programming Quizzes	Sequencing Sounds / Events and Actions in Programs	Repetition in Shapes / Repetition in Games	Selection in Physical Computing / Selection in Quizzes	Variables in Games / Sensing Movement	
Learners will show skill in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movements or new images. They will know that information can be retrieved from digital devices and the internet. They will play with a range of materials to learn cause and effect and explore programmable toys. They will learn to create a simple program on a computer. They will sequence stories and use talk to help work out problems and organise thinking and activities. They will explain how things work and why they might happen.	Learners will be introduced to early programming concepts. They will explore using individual commands, both with other learners and as part of a computer program. They will identify what each command for a floor robot does and use that knowledge to start predicting the outcome of programs. Learners will be introduced to on-screen programming through ScratchJr. They will explore the way a project looks using different sprites and backgrounds. They will use programming blocks to use, modify, and create programs. Learners will also be introduced to the early stages of program design through the introduction of algorithms.	Learners will develop their understanding of instructions in sequences and the use of logical reasoning to predict outcomes. They will use given commands in different orders to investigate how the order affects the outcome. They will also learn about design in programming. They will develop artwork and test it for use in a program. They will design algorithms and then test those algorithms as programs and debug them. They will use and modify designs to create their own quiz questions in ScratchJr and realise these designs in ScratchJr using blocks of code. Learners will evaluate their work and make improvements to their programming projects.	Learners will continue to explore the concept of sequencing in programming through Scratch. They will be introduced to a selection of motion, sound, and event blocks which they will use to create their own programs, featuring sequences. They will explore the links between events and actions, whilst consolidating prior learning relating to sequencing. They will begin by moving a sprite in four directions, and then explore movement within the context of a maze, using design to choose an appropriately sized sprite. Learners will be given the opportunity to draw lines with sprites and change the size and colour of lines. They will design and code their own maze tracing program.	Learners will explore the concept of repetition and loops within programming. They will create programs by planning, modifying, and testing commands to create shapes and patterns. They will learn to use Logo, a text-based programming language. Learners will look at the difference between count-controlled and infinite loops and use their knowledge to modify existing animations and games using repetition. Their final project is to design and create a game which uses repetition, applying stages of programming design throughout.	Learners will use physical computing to explore the concept of selection in programming through the use of the Crumble programming environment. Learners will be introduced to a microcontroller (Crumble controller) and learn how to connect and program components (including output devices- LEDs and motors). Learners will be introduced to conditions as a means of controlling the flow of actions and make use of their knowledge of repetition and conditions when introduced to the concept of selection. They will develop their knowledge of selection by revisiting how conditions can be used in programs and then learning how the If... Then... Else structure can be used to select different outcomes depending on whether a condition is true or false. They represent this understanding in algorithms and then by constructing programs using the Scratch programming environment. They use their knowledge of writing programs and using selection to control outcomes to design a quiz in response to a given task and implement it as a program.	Learners will find out what variables are and relate them to real-world examples of values that can be set and changed. They will use variables to create a simulation of a scoreboard, and experiment with variables in an existing project before creating their own. They will focus on design and apply their knowledge of variables and design to improve their games in Scratch. They will bring together elements of all the four programming constructs: sequence from Year 3, repetition from Year 4, selection from Year 5, and variables (introduced in Year 6 and have the opportunity to use all of these in a different, but still familiar environment, while also utilising a physical device — the micro: bit.	Children may be assessed as being greater depth in this curriculum area if they are able to meet the expected outcomes of the year group above their chronological age securely. Year 6s may be judged as greater depth if they are able to show a deeper understanding of efficiency in algorithms, knowing how conditions can be used to make a programming sequence more user friendly. They may also be able to debug more complex algorithms.

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Key Vocabulary						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
computer laptop tablet i-Pad device Internet toy record mouse program	technology desktop laptop logging in click drag keyboard save arrow keys cursor space bar double-click font delete digital memory command instruction direction sequence label group record word processor sprite programming block	information technology devices e-safety digital device landscape portrait format composition autofocus tool editing sequence algorithm debug data attribute digital music algorithm blocks outcome	inputs/ outputs Wi-Fi network switch server wireless access point network(ed) stop- frame animation media sprites backdrops commands blocks algorithm code branching database font edit page orientation placeholder template paste desktop publishing programming extension debugging code	networked devices World Wide Web websites/ web pages online content ownership audio recording copyright soundwave view podcast commands value code snippet template algorithm repetition count controlled loop data set sensor data logger interval digital images crop photo editing cloning infinite loop	systems input process output address bar search engine web crawler index rank visual media camera angles circuit microcontroller infinite loop condition conditional loop debug database field record flat-file database grouping vector drawings resize rotate duplicate alignment grid layer conditions setup code	IP address protocols Domain Name Server data packet HTML code copyright-free images fair use navigation path hyperlink variable placeholder spreadsheet cell formula group resize duplicate emulator controllable device flow physical input operand