

Brookside Computing Curriculum Sequencing

National Curriculum Objectives	KS1	KS2
	Year 1/Year 2	Year 3-6
Algorithms and programming	<ul style="list-style-type: none"> <li>• understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions</li> <li>• create and debug simple programs</li> <li>• use logical reasoning to predict the behaviour of simple programs</li> </ul>	<ul style="list-style-type: none"> <li>• design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts</li> <li>• use sequence, selection, and repetition in programs; work with variables and various forms of input and output</li> <li>• use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs</li> </ul>
Technology	<ul style="list-style-type: none"> <li>• use technology purposefully to create, organise, store, manipulate and retrieve digital content</li> <li>• recognise common uses of information technology beyond school</li> <li>• use technology safely and respectfully, keeping personal information private</li> <li>• identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies</li> </ul>	<ul style="list-style-type: none"> <li>• 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</li> <li>• 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</li> <li>• use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact</li> </ul>

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Skills Progression	KS1	KS2	
	Year 1/Year 2	Year 3/Year 4	Year 5/Year 6
Algorithms and Programming	<p>Programming:</p> <p>Moving a robot: explore using individual commands, both with others and as part of a computer program. They will identify what each floor robot command does and use that knowledge to start predicting the outcome of programs. They are also introduced to the early stages of program design through the introduction of algorithms.</p> <p>Programming animations: introduces learners to on-screen programming through ScratchJr. They will explore the way a project looks by investigating sprites and backgrounds. They will use programming blocks to use, modify, and create programs. Introduction to the early stages of program design through the introduction of algorithms.</p> <p>Robot algorithms: develops learners' 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.</p> <p>Programming quizzes: pupils begin to understand that sequences of commands have an outcome and make predictions based on their learning. They use and modify designs to create their own quiz questions in ScratchJr and realise these designs in ScratchJr using blocks of code. Finally, they will evaluate their work and make improvements to their programming projects.</p>	<p>Programming:</p> <p>Sequencing sounds: explore the concept of sequencing in programming through Scratch. Introduction to the programming environment. They will be introduced to a selection of motion, sound, and event blocks which they will use to create their own programs, featuring sequences. The final project is to make a representation of a piano. They will apply stages of program design through this unit.</p> <p>Events and actions in programmes: explore the links between events and actions, whilst consolidating prior learning relating to sequencing. Begin by moving a sprite in four directions (up, down, left and right). They will then explore movement within the context of a maze, using design to choose an appropriately sized sprite.</p> <p>Introduction to programming extensions through the use of pen blocks. Draw lines with sprites and change the size and colour of lines. The unit concludes with them designing and coding their own maze tracing program.</p> <p>Repetition in shapes: they will look at repetition and loops within programming. Pupils will create programs by planning, modifying, and testing commands to create shapes and patterns. They will use Logo, a text-based programming language.</p> <p>Repetition in games: explore the concept of repetition in programming using the Scratch environment. Begin with a Scratch activity where learners can discover similarities between previous units. Learners 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.</p>	<p>Programming:</p> <p>Selection in physical computing: pupils will use physical computing to explore the concept of selection in programming through the use of the Crumble programming environment. They will be introduced to a microcontroller (Crumble controller) and learn how to connect and program components (including output devices- LEDs and motors) through the application of their existing programming knowledge. Introduction 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 (through the if, then structure).</p> <p>Selection in quizzes: pupils 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.</p> <p>Variables in games: pupils explore the concept of variables in programming through games in Scratch. They find out what variables are and relate them to real-world examples of values that can be set and changed. Then they use variables to create a simulation of a scoreboard. In Lessons 2, 3, and 5, which follow the Use-Modify-Create model, learners experiment with variables in an existing project, then modify them, before they create their own project. In Lesson 4, learners focus on design. Finally, in Lesson 6, learners apply their knowledge of variables and design to improve their games in Scratch.</p> <p>Sensing movement: this brings 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 – 'Programming A'). It offers pupils the opportunity to use all of these constructs in a different, but still familiar environment, while also utilising a physical device — the micro:bit. The unit begins with a simple program for pupils to build in and test within the new programming environment, before transferring it to their micro:bit. Pupils then take on three new projects in Lessons 2, 3, and 4, with each lesson adding more depth.</p>

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<h3 style="margin: 0;">Technology</h3>	<p><b>Computing systems and networks:</b></p> <p>Technology around us: develop understanding of technology and how it can help. Become more familiar with the different components of a computer by developing keyboard and mouse skills. Start to consider how to use technology responsibly.</p> <p>IT around us: understanding of how information technology (IT) being used for good in our lives. With an initial focus on IT in the home, they will explore how IT benefits society in places such as shops, libraries, and hospitals. Whilst discussing the responsible use of technology and how to make smart choices when using it.</p> <p><b>Creating media:</b></p> <p>Digital painting: explore the world of digital art and its exciting range of creative tools. Create paintings, while getting inspiration from a range of other artists. Consider preferences when painting with, and without, the use of digital devices.</p> <p>Digital writing: using a computer to create and change text. They will familiarise themselves with typing on a keyboard and begin using tools to change the look of their writing. Then they will consider the differences between using a computer and writing on paper to create text.</p> <p>Digital photography: 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.</p> <p>Digital music: exploration on 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, they will share their creations and compare creating music digitally and non-digitally.</p>	<p><b>Computing systems and networks:</b></p> <p>Connecting computers: develop understanding of digital devices, with an initial focus on inputs, processes, and outputs. Start by comparing digital and non-digital devices, before introducing them to computer networks that include network infrastructure devices like routers and switches.</p> <p>The internet: apply 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 explore the World Wide Web for themselves 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.</p> <p><b>Creating media:</b></p> <p>Stop-motion animation: use a range of techniques to create a stop-frame animation using tablets. Next, they will apply those skills to create a story-based animation. This unit will conclude with adding other types of media to their animation, such as music and text.</p> <p>Desktop publishing: they will become familiar with the terms 'text' and 'images' and understand that they can be used to communicate messages. They will use desktop publishing software and consider careful 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. Learners will look at a range of page layouts thinking carefully about the purpose of these and evaluate how and why desktop publishing is used in the real world.</p> <p>Audio production: identify the input device (microphone) and output devices (speaker or headphones) required to work with sound digitally. Discuss the ownership of digital audio and the copyright implications of duplicating the work of others. In order to record audio themselves, they will use Audacity to produce a podcast, which will include editing their work, adding multiple tracks, and opening and saving the audio files. Finally, they will evaluate their work and give feedback to their peers.</p>	<p><b>Computing systems and networks:</b></p> <p>Systems and searching: pupils will develop their understanding of computer systems and how information is transferred between systems and devices. They will consider small-scale systems as well as large-scale systems. They will explain the input, output, and process aspects of a variety of different real-world systems. They will also take part in a collaborative online project with other class members and develop their skills in working together online.</p> <p>Communication and collaboration: explore how data is transferred over the internet. Pupils initially focus on addressing, before they move on to the makeup and structure of data packets. They 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.</p> <p><b>Creating media:</b></p> <p>Video production: pupils will learn how to create short videos in groups. As they progress, they will be exposed to topic-based language and develop the skills of capturing, editing, and manipulating video. Active learning is encouraged through guided questions and by working in small groups to investigate the use of devices and software. Pupils are guided with step-by-step support to take their idea from conception to completion. The use of green screen can be incorporated into this unit. In conclusion, pupils have the opportunity to reflect on and assess their progress in creating a video.</p> <p>Introduction to vector graphics: pupils will start to create vector drawings. They learn how to use different drawing tools to help them create images. They recognise that images in vector drawings are created using shapes and lines, and each individual element in the drawing is called an object. They layer their objects and begin grouping and duplicating them to support the creation of more complex pieces of work. This unit is planned using the Google Drawings app.</p> <p>Web page creation: introduction to the creation of websites for a chosen purpose. Pupils identify what makes a good web page and use this information to design and evaluate their own website using Google Sites. Throughout the process pupils pay specific attention to copyright and fair use of media, the aesthetics of the site, and navigation paths.</p> <p>3-D modelling: develop knowledge and understanding of using a computer to produce 3D models. Pupils will initially</p>
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Where skills & objectives are taught.	KS1	KS2	
	Year 1/Year 2	Year 3/Year 4	Year 5/Year 6
<b>Algorithms and Programming</b>	<p><u>Year A</u> Moving a robot – Beebots Robot algorithms - Beebots</p> <p><u>Year B</u> Introduction to animation – Scratch Jr. Introduction to quizzes – Scratch Jr.</p>	<p><u>Year A</u> Sequencing sounds Events and actions</p> <p><u>Year B</u> Repetition in shapes Repetition in games</p>	<p><u>Year A</u> Selection in physical computing Selection in quizzes</p> <p><u>Year B</u> Variables in games Sensing movement</p>
<b>Technology</b>	<p><u>Year A</u> <b>Technology around us</b> Digital painting Digital photography Making music</p> <p><u>Year B</u> <b>IT around us</b> Digital writing <b>Grouping data</b> <b>Pictograms</b></p>	<p><u>Year A</u> <b>Connecting computers</b> Stop-motion animation Desktop publishing <b>Branching databases</b></p> <p><u>Year B</u> <b>The internet</b> Audio editing Photo editing <b>Data logging</b></p>	<p><u>Year A</u> <b>Systems and searching</b> 3-D modelling <b>Flat-file databases</b> <b>Introduction to spreadsheets</b></p> <p><u>Year B</u> <b>Communication and collaboration</b> Video editing Vector drawing Web page creation</p>