

# Computing Curriculum

## Curriculum map



	Autumn Half Term 1	Autumn Half Term 2	Spring Half Term 1	Spring Half Term 2	Summer Half Term 1	Summer Half Term 2
	Computing systems and networks	Creating media	Programming (A)	Data and information	Creating media	Programming (B)
Year 1	Technology around us	Digital painting	Moving a robot	Grouping data	Digital writing	Programming animations
Year 2	Information technology around us	Digital photography	Robot algorithms	Pictograms	Making music	Programming quizzes
Year 3	Connecting computers	Stop-frame animation	Sequencing sounds	Branching databases	Desktop publishing	Events and actions in programs
Year 4	The internet	Audio production	Repetition in shapes	Data logging	Photo editing	Repetition in games
Year 5	Sharing information	Video production	Selection in physical computing	Flat-file databases	Vector drawing	Selection in quizzes
Year 6	Internet communication	Webpage creation	Variables in games	Introduction to spreadsheets	3D modelling	Sensing movement

# Computing Curriculum

## Curriculum overview



	Autumn	Spring	Summer
EYFS	<p>Within EYFS, the most relevant statements for Computing are taken from the following areas of learning:</p> <ul style="list-style-type: none"><li>•Personal, Social and Emotional Development</li><li>•Physical Development</li><li>•Understanding the World</li><li>•Expressive Arts and Design</li></ul> <p>In line with the Early Learning Goals, children will be confident to try new activities and show independence, resilience and perseverance in the face of challenge, explain the reasons for rules, know right from wrong and try to behave accordingly and safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.</p> <p>At St Joseph's, children in Reception class will access Computing:</p> <ul style="list-style-type: none"><li>• Using the iPads to use a range of apps including digital painting and drawing, creating digital story books, listening to stories and reading on Oxford Owl's eBook library.</li><li>• Working on the interactive touch screen in class to access Early Years Maths programmes, watching videos and practising letter formation or completing other tasks on ActivInspire.</li></ul>		

# Computing Curriculum



<p>Year 1</p>	<p><b>Computing systems and networks – technology around us.</b> In this unit, children 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.</p> <p><b>Creating media – digital painting (Microsoft Paint)</b> In this unit, children will develop their understanding of a range of tools used for digital painting. They then use these tools to create their own digital paintings, while gaining inspiration from a range of artists’ work. The unit concludes with learners considering their preferences when painting with and without the use of digital devices.</p>	<p><b>Programming A – Moving a Robot (Beebots)</b> In this unit, children will be introduced to early programming concepts. Learners will explore using individual commands, both with other children and as part of a computer program. They will identify what each command for the floor robot does, and use that knowledge to start predicting the outcome of programs. Children are also introduced to the early stages of program design through the introduction of algorithms.</p> <p><b>Data and information – grouping data</b> This unit of work focuses on assigning data (images) with different labels in order to demonstrate how computers are able to group and present data. During this unit, children will learn about logging on to the computers, opening their documents, and saving their documents.</p>	<p><b>Creating media – digital writing</b> In this unit, children will develop their understanding of the various aspects of using a computer to create and manipulate text. They will become more familiar with using a keyboard and mouse to enter and remove text. Learners will also consider how to change the look of their text, and will be able to justify their reasoning in making these changes. Finally, learners will consider the differences between using a computer to create text, and writing text on paper. They will be able to explain which method they prefer and explain their reasoning for choosing this.</p> <p><b>Programming B – Introduction to animation (Scratch Jr)</b> In this unit, children will be introduced to on-screen programming through Scratch Jr. They will explore the way a project looks by investigating sprites and backgrounds. They will use programming blocks to use, modify, and create programs. Children will also be introduced to the early stages of program design through the introduction of algorithms.</p>
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# Computing Curriculum



Year 2	<p><b>Computing systems and networks - information technology around us</b> In this unit, children 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. They will then investigate how IT improves our world, and learn about the importance of using IT responsibly.</p> <p><b>Creating media – digital photography</b> In this unit, children will learn to recognise that different devices can be used to capture photographs and will gain experience capturing, editing, and improving photos. Finally, they will use this knowledge to recognise that images they see may not be real.</p>	<p><b>Programming A – Robot algorithms</b> This unit develops children’s 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, and design algorithms and then test those algorithms as programs and debug them.</p> <p><b>Data and information – pictograms</b> In this unit, children will begin to understand what the term data means and how data can be collected in the form of a tally chart. They will learn the term ‘attribute’ and use this to help them organise data. They will then progress onto presenting data in the form of pictograms and finally block diagrams. Children will use the data presented to answer questions.</p>	<p><b>Creating media – making music</b> In this unit, children will be using a computer to create music. They will listen to a variety of pieces of music and consider how music can make them think and feel. Children will compare creating music digitally and non-digitally. Learners will look at patterns and purposefully create music.</p> <p><b>Programming B – Programming quizzes</b> This unit initially recaps on learning from the Year 1 ScratchJr unit ‘Programming animations’. Children 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, learners evaluate their work and make improvements to their programming projects.</p>
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# Computing Curriculum



Year 3	<p><b>Computing systems and networks – connecting computers</b>                  In this unit, children 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, children will be introduced to computer networks, including devices that make up a network’s infrastructure, such as wireless access points and switches. Finally, they will discover the benefits of connecting devices in a network.</p> <p><b>Creating media – stop frame animation</b>                  In this unit, children will 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 children adding other types of media to their animation, such as music and text.</p>	<p><b>Programming A – sequencing sounds</b>                  This unit explores the concept of sequencing in programming through Scratch. It begins with an introduction to the programming environment, which will be new to most children. 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. The unit is paced to focus on all aspects of sequences, and make sure that knowledge is built in a structured manner. Children also apply stages of program design through this unit.</p> <p><b>Data and information – branching databases</b>                  In this unit children will develop their understanding of what a branching database is and how to create one. They will use yes/no questions to gain an understanding of what attributes are and how to use them to sort groups of objects. Children will create physical and on-screen branching databases. To conclude the unit, they will create an identification tool using a branching database, which they will test by using it. They will also consider real-world applications for branching databases.</p>	<p><b>Creating media – desktop publishing</b>                  In this unit children 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. Children 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. They 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><b>Programming B – events and actions in programs</b>                  This unit explores the links between events and actions, while consolidating prior learning relating to sequencing. Children begin by moving a sprite in four directions (up, down, left, and right). They then explore movement within the context of a maze, using design to choose an appropriately sized sprite. This unit also introduces programming extensions, through the use of Pen blocks. Children are given the opportunity to draw lines with sprites and change the size and colour of lines. The unit concludes with children designing and coding their own maze-tracing program.</p>
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# Computing Curriculum



Year 4	<p><b>Computing systems and networks – the internet</b> In this unit children 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.</p> <p><b>Creating media – audio production</b> In this unit children will identify the input device (microphone) and output devices (speaker or headphones) required to work with sound digitally. Children will discuss the ownership of digital audio and the copyright implications of duplicating the work of others. In order to record audio themselves, learners will use Audacity to produce a podcast, which will include editing their work, adding multiple tracks, and opening and saving the audio files. Finally, children will evaluate their work and give feedback to their peers.</p>	<p><b>Programming A – repetition in shapes</b> In this unit children will create programs by planning, modifying, and testing commands to create shapes and patterns. They will use Logo, a text-based programming language. This unit is the first of the two programming units in Year 4, and looks at repetition and loops within programming</p> <p><b>Data and information – data logging</b> In this unit children will consider how and why data is collected over time. They will consider the senses that humans use to experience the environment and how computers can use special input devices called sensors to monitor the environment. Children will collect data as well as access data captured over long periods of time. They will look at data points, data sets, and logging intervals. Children will spend time using a computer to review and analyse data. Towards the end of the unit, they will pose questions and then use data loggers to automatically collect the data needed to answer those questions.</p>	<p><b>Creating media – photo editing</b> In this unit children 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.</p> <p><b>Programming B – repetition in games</b> In this unit children will explore the concept of repetition in programming using the Scratch environment. The unit begins with a Scratch activity similar to that carried out in Logo in Programming unit A, where children can discover similarities between two environments. They 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>
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# Computing Curriculum



Year 5	<p><b>Computing systems and networks – sharing information</b></p> <p>In this unit children develop their understanding of computer systems and how information is transferred between systems and devices. Children 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. Children 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.</p> <p><b>Creating media – video production</b></p> <p>In this unit children will learn how to create short videos by working in pairs or groups. As they progress through this unit, they will be exposed to topic-based language and develop the skills of capturing, editing, and manipulating video. Children are guided with step-by-step support to take their idea from conception to completion. At the conclusion of the unit, children have the opportunity to reflect on and assess their progress in creating a video.</p>	<p><b>Programming A – selection in physical computing</b></p> <p>In this unit children 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 it to control components (including output devices — LEDs and motors). Children will be introduced to conditions as a means of controlling the flow of actions in a program. They will make use of their knowledge of repetition and conditions when introduced to the concept of selection (through the 'if...then...' structure) and write algorithms and programs that utilise this concept. To conclude the unit, children will design and make a working model of a fairground carousel that will demonstrate their understanding of how the microcontroller and its components are connected, and how selection can be used to control the operation of the model. Throughout this unit, children will apply the stages of programming design.</p> <p><b>Data and information – flat file databases</b></p> <p>This unit looks at how a flat-file database can be used to organise data in records. Children will use tools within a database to order and answer questions about data. They will create graphs and charts from their data to help solve problems. They will also use a real-life database to answer a question, and present their work to others.</p>	<p><b>Creating media – vector drawing</b></p> <p>In this unit children start to create vector drawings. They learn how to use different drawing tools to help them create images. Children recognise that images in vector drawings are created using shapes and lines, and each individual element in the drawing is called an object. Learners layer their objects and begin grouping and duplicating them to support the creation of more complex pieces of work.</p> <p><b>Programming B – selection in quizzes</b></p> <p>In this unit children will develop their knowledge of 'selection' by revisiting how 'conditions' can be used in programming, 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 in the Scratch programming environment. They learn how to write programs that ask questions and use selection to control the outcomes based on the answers given. They use this knowledge to design a quiz in response to a given task and implement it as a program. To conclude the unit, children evaluate their program by identifying how it meets the requirements of the task, the ways they have improved it, and further ways it could be improved.</p>
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# Computing Curriculum



Year 6	<p><b>Computing systems and networks – internet communication</b></p> <p>In this unit children explore how data is transferred over the internet. Children initially focus on addressing, before they move on to the makeup and structure of data packets. Children 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 – webpage creation</b></p> <p>In this unit children will be introduced to creating websites for a chosen purpose. Children identify what makes a good web page and use this information to design and evaluate their own website using Google Sites. Throughout the process, children pay specific attention to copyright and fair use of media, the aesthetics of the site, and navigation paths.</p>	<p><b>Programming A – variables in games</b></p> <p>This unit explores the concept of variables in programming through games in Scratch. First, children 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, children experiment with variables in an existing project, then modify them, before they create their own project. In Lesson 4, children focus on design. Finally, in Lesson 6, children apply their knowledge of variables and design to improve their games in Scratch.</p> <p><b>Data and information – introduction to spreadsheets</b></p> <p>This unit introduces the children to spreadsheets. They will be supported in organising data into columns and rows to create their own data set. Children will be taught the importance of formatting data to support calculations, while also being introduced to formulas and will begin to understand how they can be used to produce calculated data. Children will be taught how to apply formulas that include a range of cells, and apply formulas to multiple cells by duplicating them. Children will use spreadsheets to plan an event and answer questions. Finally, children will create charts, and evaluate their results in comparison to questions asked.</p>	<p><b>Creating media – 3D modelling</b></p> <p>In this unit children will develop their knowledge and understanding of using a computer to produce 3D models. Children 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 to create a model of a desk tidy. Finally, 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.</p> <p><b>Programming B – sensing</b></p> <p>This unit is the final KS2 programming unit and 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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