

St Ann's R.C. Primary School Progression of Knowledge and Skills - Computing



Statutory Requirements	EYFS	Key Stage 1	Key Stage 2
	<p>Development Matters (DfE, revised 2021; updated 2023) 3 to 4 Year Olds: Children follow familiar rules and routines independently, supporting their ability to follow simple instructions.</p> <p>Children use their developing physical skills to handle tools and resources, including simple technologies.</p> <p>Children explore how things work through investigation and experimentation, noticing cause and effect.</p> <p>By the End of Reception: Children use technology with purpose and confidence, follow simple instructions, explore cause and effect, solve problems through experimentation, and show resilience when things do not work as expected, providing secure foundations for the Key Stage 1 computing curriculum.</p>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions • create and debug simple programs • use logical reasoning to predict the behaviour of simple programs • use technology purposefully to create, organise, store, manipulate and retrieve digital content • recognise common uses of information technology beyond school • use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies. 	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • use sequence, selection, and repetition in programs; work with variables and various forms of input and output • use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs • 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 • use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • 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 • use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact

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	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Computer science</p> <p>Hardware</p>	<p>Begin to notice and talk about technology in their environment (e.g., cameras, tablets, phones)</p> <p>Explore simple technology toys (e.g., cause-and-effect toys, remote-controlled cars).</p> <p>Show curiosity about how things work by pressing buttons and observing outcomes.</p>	<p>Learning how to operate a camera or tablet to take photos and videos.</p> <p>Learning how to explore and tinker with hardware to find out how it works.</p> <p>Recognising that some devices are input devices and others are output devices.</p> <p>Learning where keys are located on the keyboard.</p>	<p>Understanding what a computer is and that it's made up of different components.</p> <p>Recognising that buttons cause effects and that technology follows instructions.</p> <p>Learning how we know that technology is doing what we want it to do via its output.</p> <p>Using greater control when taking photos with cameras, tablets or computers. Developing confidence with the keyboard and the basics of touch typing</p>	<p>Understanding what the different components of a computer do and how they work together.</p> <p>Drawing comparisons across different types of computers.</p> <p>Learning about the purpose of routers.</p>	<p>Using tablets or digital cameras to film a weather forecast.</p> <p>Understanding that weather stations use sensors to gather and record data which predicts the weather</p>	<p>Learning that external devices can be programmed by a separate computer.</p> <p>Learning the difference between ROM and RAM.</p> <p>Recognising how the size of RAM affects the processing of data.</p> <p>Understanding the fetch, decode, execute cycle.</p>	<p>Learning about the history of computers and how they have evolved over time.</p> <p>Using the understanding of historic computers to design a computer of the future.</p> <p>Understanding and identifying barcodes, QR codes and RFID.</p> <p>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</p>

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							<p>downloading, installing, copying and updating files).</p> <p>Identify different types of AI and their applications in everyday life.</p>
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<p>Computer science</p> <p>Networks and data representation</p>	<p>Use simple devices with support (e.g., pressing a button to make a sound or light).</p> <p>Begin to understand that some devices are for looking/listening (screens, speakers) and others for controlling (buttons, keyboards).</p>			<p>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.</p> <p>Identifying the key components within a network, including whether they are wired or wireless.</p> <p>Understanding that websites and videos</p>	<p>Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration.</p>	<p>Learning the vocabulary associated with data: data and transmit.</p> <p>Learning how the data for digital images can be compressed. Recognising that computers transfer data in binary and understanding simple binary addition.</p> <p>Relating binary signals (Boolean) to the simple character-based language, ASCII.</p> <p>Learning that messages can be sent by binary code, reading binary up to eight characters and carrying out binary calculations.</p> <p>Understanding how bit patterns represent images as pixels.</p>	<p>Understanding that computer networks provide multiple services</p>
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				<p>are files that are shared from one computer to another.</p> <p>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.</p>			
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<p>Computer science</p> <p>Computational thinking</p>	<p>Using logical reasoning to read simple instructions and predict the outcome.</p> <p>Begin to sequence familiar routines (e.g., “Wash hands before snack”).</p> <p>Follow simple instructions in play (e.g., “First put the block here, then add the roof”).</p>	<p>Learning that decomposition means breaking a problem down into smaller parts</p> <p>Using decomposition to solve unplugged challenges</p> <p>Using logical reasoning to predict the behaviour of simple programs</p> <p>Developing the skills associated with sequencing in unplugged activities</p> <p>Learning that an algorithm is a set of step by step instructions used to carry out a task, in a specific order</p> <p>Follow a basic set of instructions</p> <p>Assembling instructions into a simple algorithm</p>	<p>Articulating what decomposition is</p> <p>Decomposing a game to predict the algorithms used to create it</p> <p>Using decomposition to decompose a story into smaller parts</p> <p>Learning what abstraction is</p> <p>Learning that there are different levels of abstraction</p> <p>Explaining what an algorithm is</p> <p>Following an algorithm</p> <p>Creating a clear and precise algorithm</p> <p>Learning that computers use algorithms to make predictions</p> <p>Learning that programs execute</p>	<p>Using decomposition to explain the parts of a laptop computer</p> <p>Using decomposition to explore the code behind an animation</p> <p>Using repetition in programs</p> <p>Understanding that computers follow instructions</p> <p>Using an algorithm to explain the roles of different parts of a computer</p> <p>Using logical reasoning to explain how simple algorithms work</p> <p>Explaining the purpose of an algorithm</p>	<p>Solving unplugged problems by decomposing them into smaller parts</p> <p>Using decomposition to understand the purpose of a script of code</p> <p>Using decomposition to help solve problems</p> <p>Identifying patterns through unplugged activities</p> <p>Using past experiences to help solve new problems</p> <p>Using abstraction to identify the important parts when completing both plugged and unplugged activities</p> <p>Creating algorithms for a specific purpose</p>	<p>Decomposing animations into a series of images</p> <p>Decomposing a program without support</p> <p>Decomposing a story to be able to plan a program to tell a story</p> <p>Predicting how software will work based on previous experience</p> <p>Writing more complex algorithms for a purpose</p>	<p>Decomposing a program into an algorithm</p> <p>Using past experiences to help solve new problems</p> <p>Writing increasingly complex algorithms for a purpose</p>
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			by following precise instructions Incorporating loops within algorithms	Forming algorithms independently			
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<p>Computer science</p> <p>Programming</p>	<p>Following instructions as part of practical activities and games and learning to debug when things go wrong Learning to give simple instructions.</p> <p>Understand that instructions help us do things (e.g., cooking steps).</p> <p>Begin to give instructions to others in play (e.g., “Go to the door, then turn left”).</p>	<p>Programming a Bee-bot/Virtual Bee-bot to follow a planned route</p> <p>Learning to debug instructions when things go wrong</p> <p>Developing a how to video to explain how the Bee-bot works.</p> <p>Learning to debug an algorithm in an unplugged scenario</p>	<p>Using logical thinking to explore software, predicting, testing and explaining what it does</p> <p>Using an algorithm to write a basic computer program</p> <p>Learning what loops are</p> <p>Incorporating loops to make code more efficient</p>	<p>Using logical thinking to explore more complex software; predicting, testing and explaining what it does</p> <p>Incorporating loops to make code more efficient</p> <p>Remixing existing code</p> <p>Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected</p>	<p>Understanding that websites can be altered by exploring the code beneath the site</p> <p>Coding a simple game</p> <p>Using abstraction and pattern recognition to modify code</p> <p>Incorporating variables to make code more efficient</p> <p>Remixing existing code</p> <p>Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected</p>	<p>Programming an animation</p> <p>Iterating and developing their programming as they work</p> <p>Beginning to use nested loops (loops within loops)</p> <p>Debugging their own code</p> <p>Writing code to create a desired effect</p> <p>Using a range of programming commands</p> <p>Using repetition within a program</p> <p>Amending code within a live scenario</p>	<p>Debugging quickly and effectively to make a program more efficient</p> <p>Remixing existing code to explore a problem</p> <p>Using and adapting nested loops</p> <p>Programming using the language Python</p> <p>Changing a program to personalise it</p> <p>Evaluating code to understand its purpose</p> <p>Predicting code and adapting it to a chosen purpose</p> <p>Altering a website’s code to create changes</p>
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<p>Information Technology</p> <p>Using software</p>	<p>Use mark-making apps or simple paint tools to create pictures.</p>	<p>Using a basic range of tools within graphic editing software</p> <p>Taking and editing photographs</p> <p>Understanding how to create digital art using an online paint tool</p> <p>Developing control of the mouse through dragging, clicking and resizing of images to create different effects</p> <p>Developing understanding of different software tools</p>	<p>Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts</p> <p>Using word processing software to type and reformat text</p> <p>Using software to create story animations</p> <p>Creating and labelling images</p>	<p>Taking photographs and recording video to tell a story.</p> <p>Using software to edit and enhance their video adding music, sounds and text on screen with transitions</p>	<p>Building a web page and creating content for it</p> <p>Designing and creating a webpage for a given purpose</p> <p>Use software for documents, presentations, forms and spreadsheets.</p> <p>Work collaboratively with others</p>	<p>Using logical thinking to explore software more independently, making predictions based on their previous experience</p> <p>Using a software programme to create music</p> <p>Using video editing software or animation software to animate</p> <p>Identify ways to improve and edit programs, videos, images etc.</p> <p>Independently learning how to use 3D design software package</p>	<p>Using logical thinking to explore software independently, iterating ideas and testing continuously</p> <p>Using search and word processing skills to create a presentation</p> <p>Planning, recording and editing a radio play</p> <p>Creating and editing sound recordings for a specific purpose</p> <p>Creating and editing videos, adding multiple elements: music, voiceover, sound, text and transitions to create a video advert</p>
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								<p>Using design software to design a product</p> <p>Creating a website with embedded links and multiple page</p>
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<p><i>Information Technology</i></p> <p>Using email and the internet searches</p>	<p>Participating in group image searches, led by the teacher</p> <p>Know that we use technology to talk to people who are far away.</p>	<p>Searching and downloading images from the internet safely</p> <p>Understanding that we are connected to others when using the internet</p>	<p>Understanding that personal information should not be shared on the internet.</p> <p>Learning how to be respectful to others when sharing content online.</p>	<p>Learning to log in and out of an email account</p> <p>Writing an email including a subject, 'to' and 'from'</p> <p>Sending an email with an attachment</p> <p>Replying to an email</p> <p>Identifying useful terms and phrases for search engines</p>	<p>Understanding why some results come before others when searching</p> <p>Understanding that information on the internet is not all grounded in fact</p>	<p>Developing searching skills to help find relevant information on the internet</p> <p>Understanding how apps can access our personal information and how to alter the permissions.</p>	<p>Understanding how search engines work</p>
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<p>Information Technology</p> <p>Using data</p>	<p>Begin to sort and group objects by colour, size or shape during play and talk about their choices.</p> <p>Use practical activities (e.g., tallying blocks or counting fruit) to show quantities and compare amounts visually.</p> <p>Begin to classify objects into two groups (e.g., “things that roll” and “things that don’t”) and explain their reasoning.</p>	<p>Introduction to spreadsheets</p> <p>Representing data in tables, charts and pictograms</p> <p>Sorting data and creating branching databases</p> <p>Identifying where digital content can have advantages over paper when storing and manipulating data</p>	<p>Collecting and inputting data into a spreadsheet</p> <p>Interpreting data</p>	<p>Understanding the vocabulary associated with databases: field, record, data</p> <p>Learning about the pros and cons of digital versus paper databases</p> <p>Sorting and filtering databases to easily retrieve information</p> <p>Creating and interpreting charts and graphs to understand data</p>	<p>Understanding how data is collected</p>	<p>Designing a weather station which gathers and records sensor data</p>	<p>Understanding how barcodes, QR codes work</p> <p>Gathering and analysing data in real time</p> <p>Creating formulas and sorting data within spreadsheets</p>
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<p>Information Technology</p> <p>Wider use of technology</p>	<p>Recognising that a range of technology is used in places such as homes and schools</p> <p>Begin to understand that we should tell an adult if something on a screen makes us feel sad or worried.</p>	<p>Recognising common uses of information technology, including beyond school</p> <p>Understanding some of the ways we can use the internet</p>	<p>Learning how computers are used in the wider world</p>	<p>Understanding the purpose of emails.</p> <p>Learning what a search engine is</p> <p>Recognising how social media platforms are used to interact</p>	<p>Understanding that software can be used collaboratively online to work as a team</p>	<p>Learn about different forms of communication that have developed with the use of technology.</p>	<p>Learning about the Internet of Things and how it has led to 'big data'.</p> <p>Learning how 'big data' can be used to solve a problem or improve efficiency</p>
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<p>Digital literacy</p>	<p>Begin to recognise kind and unkind behaviour in a person and in stories.</p>	<p>Logging in and out and saving work on their own account</p> <p>Understand the importance of a password</p> <p>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</p> <p>Recognising when someone has been unkind online</p> <p>Learning some top tips for staying safe online</p> <p>Understanding how we 'share' information on the internet</p>	<p>Understanding that personal information should not be shared on the internet.</p> <p>Learning how to be respectful to others when sharing content online.</p>	<p>Learning to be a responsible digital citizen; understanding their responsibilities to treat others respectfully and recognising when digital behaviour is unkind</p> <p>Learning about cyberbullying</p> <p>Learning that not all emails are genuine, recognising when an email might be fake and what to do about it</p> <p>Learning that not all information on the internet is factual</p> <p>Understanding who personal information should/ should</p>	<p>Recognising what appropriate behaviour is when collaborating with others online</p> <p>Recognising that information on the Internet might not be true or correct and that some sources are more trustworthy than others</p> <p>Learning about different forms of advertising</p>	<p>Learning about how permissions work and how to change them</p> <p>Identifying possible issues with online communication</p> <p>Considering the effects of screen-time on physical and mental wellbeing</p> <p>Learning about online bullying and where to seek advice</p>	<p>Understanding the importance of secure passwords and how to create them, along with two-step authentication</p> <p>Using search engines safely and effectively</p> <p>Recognising that updated software can help to prevent data corruption and hacking</p> <p>Considering their digital footprint and online reputation and future implications they may have</p> <p>Learning about how to collect evidence and report online bullying concerns</p>
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