



Bearwood Primary and Nursery School

Computing Progression of Knowledge

'Learning, Enjoying and Succeeding Together'

LEARNING, ENJOYING,
& SUCCEEDING
TOGETHER!

<p>National Curriculum Context A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Buildings on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.</p>	<p>National Curriculum KS1 *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 material on the internet or other online technologies</p>		<p>National Curriculum KS2 *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</p>				
	EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6 – Units must be completed in order
Online Safety	<p><u>Self-image & Identity:</u> I know that I can say 'no' / 'please stop' / 'I'll tell' / 'I'll ask' to somebody who asks me to do something that makes me feel sad, upset or embarrassed.</p> <p><u>Online Relationships:</u> I can recognise some</p>	<p><u>Self-image & Identity:</u> If something happens online which makes me feel sad, worried, uncomfortable or frightened, I can give examples of when and how to speak to an adult I can trust and how they can help.</p> <p><u>Online Relationships:</u> I</p>	<p><u>Self-image & Identity:</u> I can give examples of issues online that might make someone feel sad, worried, uncomfortable or frightened and give examples of how they might get help.</p> <p><u>Online relationships:</u> I can give examples of</p>	<p><u>Self-image & Identity:</u> I can explain ways in which someone might change their identity depending on what they are doing online (e.g. gaming; using an avatar, social media) and why.</p> <p><u>Online relationships:</u> I can explain what is</p>	<p><u>Self-image & Identity:</u> I can explain how my online identity can be different to my offline identity.</p> <p><u>Online relationships:</u> I can describe strategies for safe and fun experiences in a range of online social environments.</p>	<p><u>Self-image & Identity:</u> I can explain how identity online can be copied, modified or altered.</p> <p><u>Online relationships:</u> I can explain that there are some people I communicate with online who may want to do me or my friends</p>	<p><u>Self-image & Identity:</u> I can identify and critically evaluate online content relating to gender, race, religion, disability, culture and other groups. I can explain why it is important to challenge and reject inappropriate representations</p>

<p>ways in which the internet can be used to communicate</p> <p><u>Online reputation:</u> I understand that I can put information online for others to see.</p> <p><u>Managing Online information:</u> I can talk about how to use the internet as a way of finding information online. I can identify devices I can use to access information online.</p> <p><u>Copyright & ownership:</u> I know that the work I create belongs to me.</p> <p><u>Health, well being, lifestyle:</u> I can identify rules that help keep us safe and healthy in and beyond the home when using technology. I can name at least one trusted adult who can help me keep safe when using technology / internet.</p> <p><u>Privacy & Security:</u> I can identify some simple examples of my personal information (e.g. name, address, birthday, age, location)</p> <p><u>Online bullying:</u> I can</p>	<p>know why it is important to be considerate and kind to people online and to respect their choices.</p> <p><u>Online reputation:</u> I know that I should not share my personal information online.</p> <p><u>Managing online information:</u> I know and understand that we can encounter a range of things online including things we like and don't like as well as things which are real / not real or a joke.</p> <p><u>Copyright & ownership:</u> I know that the work I create using technology belongs to me.</p> <p><u>Health, well being, lifestyle:</u> I can explain rules to keep myself safe when using technology both in and beyond the home.</p> <p><u>Privacy & Security</u> I can explain that passwords are used to protect information, accounts and devices. I can recognise more detailed examples of information that is personal to someone (e.g. address)</p>	<p>how someone might use technology to communicate with other they don't also know offline and explain why this might be risky. I can describe different ways to ask for, give, deny my permission online.</p> <p><u>Online reputation:</u> I can explain how information put online about someone can last for a long time.</p> <p><u>Managing Online information:</u> I can demonstrate how to navigate a simple webpage to get to information I need (e.g. home, forward, back buttons; links, tabs, sections)</p> <p><u>Copyright & ownership:</u> I can describe why other people's work belongs to them.</p> <p><u>Privacy & Security:</u> I can explain and give examples of what is meant by 'private' and 'keeping things private'</p> <p><u>Online bullying:</u> I can talk about how anyone experiencing bullying can get help.</p>	<p>meant by 'trusting someone online', why this is different from 'liking someone online', and why it is important to be careful about who to trust online inc. what information and content they are trusted with.</p> <p><u>Online reputation:</u> I can explain the need to be careful before sharing anything personal online.</p> <p><u>Managing Online information:</u> I can demonstrate how to use key phrases in search engines to gather accurate information online. Explain the difference between 'belief', 'opinion' and 'fact' and can give examples of how and where they might be shared online.</p> <p><u>Copyright & ownership:</u> I can explain why copying someone else's work from the internet without permission isn't fair and can explain what problems this might cause.</p> <p><u>Health, well being, lifestyle:</u> I can explain why some online</p>	<p>I can give examples of how to be respectful to others online and describe how to recognise healthy and unhealthy online behaviours.</p> <p><u>Online reputation:</u> I can explain ways that some of the information about anyone online could have been created, copied or shared by others.</p> <p><u>Managing Online information:</u> I can analyse information to make a judgement about probable accuracy.</p> <p><u>Copyright & ownership:</u> When searching on the internet for content to use, I can explain why I need to consider who owns it and whether I have the right to reuse it.</p> <p><u>Health, well being, lifestyle:</u> I can explain how using technology can be a distraction from other things, in both a positive and negative way</p> <p><u>Privacy & Security:</u> I can describe how some online services may</p>	<p>harm. I can recognise that this is not my / our fault.</p> <p><u>Online reputation:</u> I can describe ways that information about anyone online can be used by others to make judgements about an individual and why these may be incorrect.</p> <p><u>Managing Online information:</u> I can evaluate digital content and can explain how to make choices about what is trustworthy.</p> <p><u>Copyright & ownership:</u> I can assess and justify when it is acceptable to use the work of others.</p> <p><u>Health, well being, lifestyle:</u> I can describe ways technology can affect health and well-being both positively and negatively.</p> <p><u>Privacy & Security:</u> I can explain what a strong password is and demonstrate how to create one. I can explain what app permissions are and can give some examples</p> <p><u>Online bullying:</u> I can</p>	<p>online.</p> <p><u>Online relationships:</u> I can describe how things shared privately online can have unintended consequences for others (e.g. screen grabs).</p> <p><u>Online reputation:</u> I can explain the ways in which anyone can develop a positive online reputation</p> <p><u>Managing Online information:</u> I can explain how someone might encounter 'influence', 'manipulation' and 'persuasion' online (e.g. advertising or targeting for fake news).</p> <p><u>Copyright & ownership:</u> I can demonstrate how to make references to and acknowledge sources I have used from the internet.</p> <p><u>Health, wellbeing, lifestyle:</u> I recognise and can discuss the pressures that technology can place on someone and how / when they could manage this.</p> <p><u>Privacy & Security:</u> I</p>
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	describe ways that some people can be unkind online.	<u>Online bullying:</u> I can describe how to behave online in ways that do not upset others and can give examples.		activities have age restrictions and why it is important to follow them. <u>Privacy & Security:</u> I can describe how connected devices can collect and share anyone's information with others. <u>Online bullying:</u> I can give examples of how bullying behaviour could appear online and how someone can get support.	seek consent to store information about me. <u>Online bullying:</u> I can explain why people need to think carefully about how content they post online might affect others, their feelings and how it may affect how others feel about them (their reputation).	describe how what one person perceives as playful joking and teasing ('banter') might be experienced by others as bullying.	can describe effective ways people can manage passwords. I can explain what to do if a password is shared, lost or stolen. <u>Online bullying:</u> I can explain how someone would report online bullying in different contexts.
Programming	children will have access to Beebots	<u>Unit: We are treasure hunters</u> Outcome: A sequence of instructions that will move a programmable toy along a given route. <u>Knowledge</u> Understand what a basic algorithm is. Understand how algorithms are implemented on programs on digital devices. Know how to create and debug simple algorithms. Know how to use logical reasoning to	<u>Unit: We are astronauts</u> Outcome: A Scratch program in which a sprite moves around the screen <u>Knowledge</u> Have a clear understanding of algorithms as sequences of instructions. Know how to convert simple algorithms to programs using Scratch. Know what the outcome or intention of an algorithm is.	<u>Unit: We are programmers</u> Outcome: A short, scripted animated cartoon. <u>Knowledge</u> Know how to design, write and debug a program to accomplish a specific goal. Know how to use variables and various forms of input and output using Scratch Know how to detect and correct errors in algorithms and programs.	<u>Unit: We are software developers</u> Outcome: Know how to develop an educational computer game using selection and repetition. <u>Knowledge</u> Understand and use a wide range of variables on Scratch. Know how to debug computer programs. Recognise the importance of user interface design, including consideration of input and output.	<u>Unit: We are game developers</u> Outcome: An original computer game <u>Knowledge</u> Create original artwork and sound for a game. Know how to create a computer game which uses sequence, selection, repetition and variables. Know how to detect and correct errors in a computer game. Use iterative development techniques to improve their game.	<u>Unit: We are interface designers</u> Outcome: Wireframe designs and media assets for their apps. <u>Knowledge</u> Understand how to design, write and debug programs to accomplish specific goals including controlling or simulating physical systems. Know how to use software to design an apps interface. Know how to use wireframing tools to create a design prototype.

		<p>predict the behaviour of simple programs.</p> <p><u>Unit: We are TV chefs</u></p> <p>Outcome: A short video showing how to make a simple meal or snack.</p> <p><u>Knowledge:</u> Understand what an algorithm is.</p> <p>Know how to record an algorithm as a set of simple instructions.</p> <p>Know how to record a video.</p>	<p>Know how to spot errors and debug algorithms.</p> <p><u>Unit: We are games testers</u></p> <p>Outcome: Notes on how games work as text, audio or screen cast video.</p> <p><u>Knowledge</u> Be aware of how to use games safely and in balance with other activities.</p> <p>Know what the outcome or intention of an algorithm is.</p> <p>Understand how some simple Scratch games work.</p> <p>Recognise common uses of information technology beyond school.</p>	<p>Know how to select and combine a variety of software to accomplish a given goal.</p> <p><u>Unit: We are bug fixers</u></p> <p>Outcome: A debugged Scratch script and explanatory screen casts.</p> <p><u>Knowledge</u> Understand a number of strategies for finding errors in programs.</p> <p>Understand different strategies for problem solving.</p> <p>Recognise a number of common types of bug in software.</p> <p>Use sequence, selection and repetition in programs.</p>	<p>Design, write and debug programs that accomplish specific goals.</p> <p><u>Unit: We are toy designers</u></p> <p>Outcome: scripts for an on screen prototype of a computer controlled toy – Dragon’s Den style presentation.</p> <p><u>Knowledge</u> Understand different forms of input and output such as sensors, switches, motors, lights, speakers (link to science).</p> <p>Design, write and debug the control and monitoring programme for their toy.</p>	<p><u>Unit: We are cryptographers</u></p> <p>Outcome: Morse and semaphore messages, encrypted and decrypted messages in various ciphers.</p> <p><u>Knowledge</u> Understand what semaphore and Morse code is.</p> <p>Understand the need for private information to be encrypted.</p> <p>Know how to encrypt and decrypt messages in simple ciphers.</p> <p>Understand the need to use complex passwords and to keep them secure.</p> <p>Understand how encryption works on the web.</p>	<p>Be able to record design decisions and processes.</p> <p><u>Unit: We are app developers</u></p> <p>Outcome: a working app</p> <p><u>Knowledge</u> Know how to use another programming toolkit or development platform.</p> <p>Know how to import existing media assets to their projects.</p> <p>Know how to record an algorithm for their app.</p> <p>Know how to program, debug and refine the code.</p> <p>Know how they can test their app.</p>
Connecting Responsibly	Children to begin to practice logging onto the laptops using their own login details	<p><u>Unit: We are storytellers</u></p> <p>Outcome: A talking book</p> <p><u>Knowledge</u> Know how to use sound recording equipment.</p>	<p><u>Unit: We are detectives</u></p> <p>Outcome: Class emails requesting information to solve a mystery.</p> <p><u>Knowledge</u> Understand that emails can be used to communicate.</p>	<p><u>Unit: We are network engineers</u></p> <p>Outcome: Pupils use network diagnostic tools to test and explore network connections.</p> <p><u>Knowledge</u> Understand the physical hardware</p>	<p><u>Unit: We are HTML editors</u></p> <p>Outcome: HTML challenges and a personal home page</p> <p><u>Knowledge</u> Understand some technical aspects of how the internet</p>	<p><u>Unit: We are web developers</u></p> <p>Outcome: Website offering advice on all aspects of safe and responsible use.</p> <p><u>Knowledge</u> Know how to use research skills to decide what</p>	<p><u>Unit: We are market researchers</u></p> <p>Outcome: Presentation identifying the market for their app and establishing users’ expectations of it.</p> <p><u>Knowledge</u></p>

		<p>Know how to save and store sounds on a computer</p> <p>Understand how a talking book differs from a paper-based book</p> <p>How to use technology safely and respectfully</p> <p><u>Unit: We are celebrating</u></p> <p>Outcome: A greetings card</p> <p><u>Knowledge</u> Know how to use the web to find and select images</p> <p>Know how to use basic keyboard skills through typing and formatting text.</p> <p>Know how to store and retrieve files</p> <p>Know how to combine text and images</p>	<p>Know how to open, compose and send an email.</p> <p>Know appropriate language to use in emails.</p> <p>Know how to edit and format text in emails.</p> <p>Be aware of e-safety issues when using email.</p>	<p>connections necessary for computer networks to work.</p> <p>Understand some features of internet protocols.</p> <p>Understand some diagnostic tools for investigating network connections. Develop a basic understanding of how domain names are converted in IP addresses</p> <p><u>Unit: We are communicators</u></p> <p>Outcome: emails.</p> <p><u>Knowledge</u> Develop a basic understanding of how email works.</p> <p>Be aware of broader issues surrounding email including 'netiquette' and e-safety.</p> <p>compose and send an email.</p> <p>Know appropriate language to use in emails.</p> <p>Know how to edit and format text in emails</p>	<p>makes the web possible.</p> <p>Know how to use HTML tags for elementary mark up.</p> <p>Use hyperlinks to connect ideas and sources.</p> <p>Code up a simple web page with useful content.</p> <p>Understand some of the risks in using the web.</p> <p><u>Unit: We are co-authors</u></p> <p>Outcome: Class wiki and amended pages of Wikipedia.</p> <p><u>Knowledge</u> Understand the conventions for collaborative online work particularly in wikis.</p> <p>Know the responsibilities when editing other peoples' work.</p> <p>Understand the potential problems associated when using Wikipedia.</p> <p>Know how to use the internet for research.</p>	<p>information is appropriate.</p> <p>Understand some elements of how search engines select and rank results.</p> <p>Know how to refine their ideas. Develop understanding of responsible use of technology.</p> <p><u>Unit: We are bloggers</u></p> <p>Outcome: A media rich online blog.</p> <p><u>Knowledge</u> Understand what a blog is</p> <p>Know how to create a sequence of blog posts on a theme.</p> <p>Know how to incorporate additional media.</p> <p>Know how to comment on the posts of others. Understand what constitutes acceptable behaviour in terms of comments on blogs.</p>	<p>Know how to create a set of survey questions.</p> <p>Know how to present the data using different graphing or charting software.</p> <p>Know how to use the information obtained to develop their product.</p> <p>Know how to use different software to present research findings.</p>
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				<p><u>Unit: We are opinion pollsters</u></p> <p>Outcome: online opinion poll survey, charts showing analysis of data, brief illustrated report.</p> <p><u>Knowledge</u></p> <p>Understand some elements of survey design.</p> <p>Understand some ethical and legal aspects of online data collection.</p> <p>Know how to use the web to facilitate data collection.</p> <p>Know how to create a chart and analyse data.</p>			
<p>Selecting and Combining Information</p>	<p>recognising the children's use of technology outside of school</p>	<p><u>Unit: We are painters</u></p> <p>Outcome: A piece of electronic artwork to illustrate a traditional tale collated into an e-book.</p> <p><u>Knowledge</u></p> <p>Know which programs can be used for which purposes.</p> <p>Recognise common uses of information technology beyond school.</p>	<p><u>Unit: We are photographers</u></p> <p>Outcome: A class portfolio of original photographs.</p> <p><u>Knowledge</u></p> <p>Know how to use a digital camera or camera app.</p> <p>Know how to store and retrieve photos.</p> <p>Know how to edit and enhance photos.</p>	<p><u>Unit: We are presenters</u></p> <p>.</p> <p>Outcome: One minute of edited video of children performing an activity with narrated commentary.</p> <p><u>Knowledge</u></p> <p>Know how to use a digital camera or camera app to record a video.</p> <p>Know how to store and retrieve videos.</p>	<p><u>Unit: We are musicians</u></p> <p>Outcome: a piece of backing music to accompany work in another medium.</p> <p><u>Knowledge</u></p> <p>To be able to use one or more programs to edit music.</p> <p>Know how to develop a musical composition. Know how their composition can</p>	<p><u>Unit: We are artists</u></p> <p>Outcome: Pieces of geometric art and a Scratch computer program for drawing shapes.</p> <p><u>Knowledge</u></p> <p>Understand how to use tools and techniques of a vector graphics package.</p> <p>Develop an understanding of turtle graphics.</p>	<p><u>Unit: We are app planners</u></p> <p>Outcome: A presentation to pitch a smartphone or tablet app.</p> <p><u>Knowledge</u></p> <p>Understand the capabilities of smartphones and tablets.</p> <p>Understand geolocation including GPS.</p>

		<p>Know how to use 2Simple 2Paint software.</p> <p><u>Unit: We are collectors</u></p> <p>Outcome: A number of presentation slides each with different collections of animals.</p> <p><u>Knowledge</u> Know which programs can be used for which purposes. (use of PowerPoint)</p> <p>Know how to use technology safely and respectfully.</p>	<p>Recognise common uses of information beyond school.</p> <p><u>Unit: We are researchers</u></p> <p>Outcome: Mind maps and a 2 minute multimedia presentation for a specific audience.</p> <p><u>Knowledge</u> Know how to use the internet safely to research information.</p> <p>Know how to use technology for note taking. Know how to combine information into a PowerPoint presentation.</p> <p>Know how to copy and paste pictures.</p> <p>Know how to store and retrieve information</p> <p><u>Unit: We are zoologists</u></p> <p>Outcome: Charts and maps showing bugs found in different locations.</p> <p><u>Knowledge</u> Know how to collect data using tick charts or tally charts.</p>	<p>Know how to edit a video including adding narration and editing clips.</p> <p>Understand qualities of effective video such as the importance of narrative, consistency, perspective and scene length.</p>	<p>enhance work in other media.</p> <p><u>Unit: We are meteorologists</u></p> <p>Outcome: Spreadsheet of weather data collected, chart, maps and graphs of weather data.</p> <p><u>Knowledge</u> Know how to use computer-based data logging to automate the recording of some weather data.</p> <p>Know how to use spreadsheets to create charts. Know how to identify inconsistencies in data.</p>	<p>Know how they can use tools available to refine and develop their work.</p> <p>Have an understanding of computer generated art.</p> <p><u>Unit: We are architects</u></p> <p>Outcome: A virtual gallery displaying the pupils' work.</p> <p><u>Knowledge</u> Understand the work of architects, designers and engineers working in 3D.</p> <p>Understand how to use a simple CAD tool.</p>	<p>Understand computer networks including the internet and how they provide multiple services.</p> <p>Know how to use search technologies effectively and be discerning in evaluating digital content.</p> <p>Select, use and combine a variety of software.</p> <p><u>Unit: We are project managers</u></p> <p>Outcome: A clear and detailed plan for managing the app development project.</p> <p><u>Knowledge</u> Understand how to scope a project to identify different components that must be successfully combined. Combine and use a range of programs</p> <p><u>Unit: We are marketers</u></p> <p>Outcome: Advertising material for the pupils' apps.</p>
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			<p>Know how to use simple charting software to produce pictograms and other basic charts (Purple Mash).</p> <p>Know how to record information on a digital map.</p>				<p><u>Knowledge</u></p> <p>Understand what marketing is and how to identify a USP.</p> <p>To be able to develop and print a brochure incorporating text and images.</p> <p>Further develop knowledge and understanding in relation to creating a website.</p>
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*Sticky knowledge for each year group highlighted in bold