

Computing Intent

“The Web as I envisaged it, we have not seen it yet. The future is still so much bigger...” Tim Berners-Lee, Inventor of the World Wide Web

Computing is immersive, engaging and thrillingly creative. Children at Great Bradfords Junior School thoroughly enjoy its hands-on and practical opportunities, and thrive upon being creators, as well as skilful users of technology. The computing curriculum champions excellence by supporting pupils across three main areas: **computer science**, **information technology** and **digital literacy**. The core of the subject is computer science, in which pupils solve challenging problems through coding. The skills of information technology centre on the cross-curricular use of software and hardware to produce exciting and purposeful project work. Through digital literacy, children learn how to use technology safely and to show respect for others when working online.

With computing embedded across a range of subjects at Great Bradfords Junior School, children become responsible users of technology that can work together as developers to shape the future.

Procedural Knowledge: **Skills** the children develop when learning about Computing

The national curriculum for Computing aims to ensure that all pupils:

- apply the fundamental principles and concepts of **computer science**.
- analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems.
- evaluate and apply **information technology**, including new or unfamiliar technologies, analytically to solve problems.
- are responsible, competent, confident and creative users of information and communication technology (**digital literacy**).

Throughout their time at Great Bradfords Junior School, children will start to develop the skills of **Computational thinking**: how to take a big, difficult problem and break it down into smaller, simpler steps. By the end of the Key Stage, pupils will have had the opportunity to apply computational thinking across the curriculum. More specifically, they will hone the following skills to help them become confident and responsible users of technology:

- Designing and debugging programs that accomplish specific goals.
- Using logical reasoning to explain how algorithms work and to detect and correct errors in algorithms and programs.
- Understanding computer networks (such as the internet), how such networks can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration.

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- Using search technologies effectively and being discerning in evaluating digital content.
- Selecting, using and combining a variety of software (including internet services) on a range of digital devices to accomplish given goals, including collecting, analysing, evaluating and presenting data and information.
- Using technology safely and responsibly, reporting concerns about content and contact.

Disciplinary Knowledge: **knowledge** the children will learn to develop excellence in Computing

	Year 3	Year 4	Year 5	Year 6
Computer science	understand what an algorithm is understand that programs are made up of precise and unambiguous instructions create and debug simple programs use sequence in programs and understand that instructions run in order use simple repeat loops predict and explain the behaviour of simple programs using logical reasoning solve problems by breaking them into smaller parts	deepen their understanding of sequence, selection and repetition use conditionals such as if/else in simple programs understand that events trigger actions in programs use variables to track changing information use logical reasoning to explain and debug programs more confidently create programs that can be shared with others	deepen understanding of sequence, selection and repetition use more complex loops, including nested repeat loops understand that functions are reusable blocks of code that complete specific tasks understand that functions can take input, process it and return output use variables and input/output more confidently debug programs with greater independence create and improve programs for a specific purpose	apply their understanding of sequence, selection, repetition, variables and functions in more complex programs plan, write and debug programs with increasing independence use logical reasoning to explain how algorithms work identify and correct errors in algorithms and programs create programs that simulate or control physical systems evaluate the effectiveness of a program and suggest improvements
Information technology	develop basic word processing skills	build on prior typing and formatting skills	use word processing and presentation software more	select the most appropriate software for a task

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	locate and use key keyboard functions, including: Shift Caps Lock Enter Spacebar Backspace use Undo and Redo select text by highlighting format text using: bold <i>italics</i> <u>underline</u> font colour align text using left align, right align, centre insert text boxes insert and copy images from safe and appropriate sources use keyboard shortcuts, including: Ctrl+c - copy Ctrl+v - paste Ctrl+s – save Ctrl+z - undo Ctrl+y - redo	use bullet points and numbering cut, copy and paste text crop images wrap text around images arrange images by sending forward or backward rotate images consolidate keyboard shortcuts, including: Ctrl+c -copy Ctrl+v -paste Ctrl+s -save Ctrl+x - cut Ctrl+z -undo Ctrl+y - redo	independently for a meaningful purpose and target audience organise text using headings, bullet points and numbering combine text, images and screenshots effectively refine the layout of a document or presentation for clarity and impact	combine different applications to create purposeful digital content organise, store, retrieve and present information effectively produce work for a specific audience and purpose
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	PowerPoint insert a new slide add text boxes and images resize images insert lines, arrows and shapes choose and apply a suitable background or theme design slides with a clear layout	PowerPoint add transitions animate text, images and shapes insert audio and video to support a presentation evaluate slide layout and make improvements consider how design choices affect the audience	PowerPoint plan a presentation with a clear purpose and audience in mind select an appropriate theme, layout and colour scheme combine text, images and shapes to communicate ideas effectively adjust font size, style and colour for emphasis and readability crop, resize and position images accurately evaluate slide design and make improvements to improve clarity and impact use presentation software more independently to produce a structured outcome	PowerPoint create a presentation that is carefully tailored to a target audience and purpose make deliberate and justified design choices about theme, layout, colour and font produce a consistent and professional-looking presentation across multiple slides combine text, images, shapes, audio and video to support and strengthen meaning use transitions and animation selectively to enhance communication rather than for decoration insert audio or video where it enhances meaning edit, refine and improve slide content for clarity, pace and engagement
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				understand how design choices affect the audience's response rehearse, review and improve the flow of a presentation evaluate their own and others' presentations critically and constructively work independently to produce a polished final presentation
	Excel enter simple data into a spreadsheet recognise rows and columns label and organise data clearly create simple bar graphs from collected data talk about what the data shows	Excel compare and interpret sets of data create pie charts from data choose an appropriate chart type for the data sort data by different criteria begin to discuss patterns and trends in data	Excel use spreadsheets to solve simple problems use formulae for addition (+), subtraction (-), division (/) and multiplication (*) enter formulae using SUM and AVERAGE understand that formulae can save time and improve accuracy replicate formulae across several cells check calculations for errors use spreadsheets to collect, organise and present data	Excel Pupils will learn to: use formulae confidently, including: SUM AVERAGE IF use spreadsheets to gather, analyse and present data interpret data to make informed decisions create graphs from independently collected or researched data check formulae and calculations carefully

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				use spreadsheets efficiently and accurately
Digital Literacy	use technology safely and respectfully keep personal information private recognise that not all information online is true know how to report concerns to a trusted adult understand the SMART rules recognise acceptable and unacceptable behaviour when using digital devices understand that online actions can affect other people	use search technologies safely and effectively begin to judge whether online information is reliable understand the importance of strong passwords recognise the risks of cyberbullying understand how to report inappropriate online behaviour know that images and photographs should only be shared with permission understand the importance of secure websites, including HTTPS develop greater awareness of privacy and personal information continue to apply the SMART rules	evaluate online content more critically recognise that some online material may be biased, persuasive or misleading understand how advertising is designed to attract an audience begin to recognise manipulation in digital content understand the importance of data protection think carefully before sharing information, images or videos online use online collaboration tools responsibly understand that digital behaviour can affect reputation and relationships continue to apply the SMART rules consistently	judge the reliability of digital content and online sources compare and evaluate search results from different search engines understand how search engines select and rank results recognise the role of web crawlers in indexing content understand that online communication may not be private choose appropriate online communication methods for different purposes work responsibly when collaborating online think carefully before sharing or re-sharing content understand the difference between the internet and the World Wide Web

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				recognise how to stay safe, responsible and respectful online in a range of contexts
Networks	understand that the internet is a way of connecting computers around the world recognise the internet as something people use to communicate and share information understand that the internet helps people access websites and services begin to understand that the internet is made up of lots of connected devices know that information can be sent and received online	understand that the internet is a network that connects people and devices globally recognise that the World Wide Web is part of the internet understand that the internet allows people to search, communicate and collaborate understand that information shared on the internet can travel quickly between devices begin to think carefully about what information is safe to share online	understand that computer networks are made up of connected devices understand that the internet is a network of networks recognise that networked devices allow people to share information and access services understand that data sent across networks is broken into packets identify examples of networked devices and how they connect understand the role of servers in storing and providing information understand why networks need to be protected	explain how computer networks work and how information is shared across them understand that information travelling over networks is digitised recognise that data is broken into packets that travel from source to recipient understand that networked digital devices have unique addresses understand the role of routers, switches, gateways and servers in a network explain the difference between the internet and the World Wide Web understand how people can work together online using networked systems

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				understand why networks need protecting and how this helps keep information safe
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Useful links for teachers and pupils, to understand the cornerstones of computational thinking:

<https://www.bbc.co.uk/bitesize/guides/zp92mp3/revision/1>

<https://www.theschoolrun.com/what-abstraction-computing>

<https://www.theschoolrun.com/what-computational-logic>

<https://www.theschoolrun.com/what-program#:~:text=In%20computing%2C%20programs%20are%20a,that%20the%20computer%20can%20understand.>