Barnett Wood Infant School
Progression of Knowledge and Skills Document

Computing

At Barnett Wood Infant School, we understand the immense value that technology plays not only in supporting the Computing and whole school curriculum but overall in the day-to-day life of our school. Our aims are to fulfil the requirements of the National Curriculum for Computing whilst also providing enhanced collaborative learning opportunities, engagement in rich content and supporting pupil's conceptual understanding of new concepts which support the needs of all our pupils.

Early Years Foundation Curriculum

The revised Early Years Foundation Stage (EYFS) Statutory Framework (September 2021) no longer includes specific computing or technology elements. Children will continue to engage with and explore the use of technology in their everyday play and learning. Suggested EYS Skills, Knowledge and Understanding (Curriculum) Early substantive and implicit skills will be planned and delivered through a tailored, 'in the moment' approach to engage all children of differing needs, prior experience and interest and will be evident through a range of child led and adult focussed activities. Understanding the world involves guiding children to make sense of their physical world and their community through opportunities to explore, observe and find out about people, places, technology and the environment.

'Birth to Five Matters' states: *Children require access to a range of technologies, both digital and non-digital in their early lives. Exploring with different technologies through play provides opportunities to develop skills that children will go on to develop in their lifetimes. Investigations, scientific inquiry and exploration are essential components of learning about and with technology both digitally and in the natural world. Through technology children have additional opportunities to learn across all areas in both formal and informal ways. Technologies should be seen as tools to learn both from and with, in order to integrate technology effectively within early years practice.*

Early computing skills are developed in EYFS through activities which may not involve the use of technology. This includes developing knowledge of sequence and steps in a process – adding to their schema about instructions, which will provide a strong foundation when learning about algorithms.

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Technology in the Early Years can mean:

- taking a photograph with a camera or tablet
- searching for information on the internet
- playing games on the interactive whiteboard
- exploring an old typewriter or other mechanical toys
- using a Beebot
- watching a video clip
- listening to music

National Curriculum Programme of Study for Key Stage 1

By the end of key stage 1 pupils should be taught to:

- 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.

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Substantive and Disciplinary Knowledge

Substantive knowledge (declarative) knowledge is the subject knowledge and explicit vocabulary used to learn about the content (to 'know that'). In the computing curriculum, it refers to the foundational concepts and skills that students should acquire during their early years of education. It forms the basis for their understanding and future learning in the field of computing. By building a strong foundation of substantive knowledge, students can develop a deeper understanding of computing concepts and be better prepared for future learning in the subject.

Disciplinary (procedural) knowledge in computing refers to the specific subject knowledge and skills that students should develop in the field of computing (to 'know how'). It involves understanding the key concepts, principles, and practices related to computer science, information technology, and digital literacy.

Adapting the curriculum for pupils with SEND in Computing

- Adaptive teaching takes place.
- For sensory or physically impaired pupils, computing learning may necessitate enlarging texts, using clear fonts, using visual overlays, or audio description of images.
- Dyslexic pupils may benefit from well-spaced print.
- Teachers identify and break down the components of the subject curriculum into manageable chunks for pupils who find learning more difficult, particularly those with cognition and learning needs. These may be smaller 'steps' than those taken by other pupils to avoid overloading the working memory.
- A variety of additional scaffolds may be used in lessons, such vocabulary banks, additional visual stimuli or adult support.

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	EYFS	Year 1
Substantive Knowledge (Declarative)		
Autumn Term	EYFS Curriculum is taught across the prime and specific areas of learning. By the end of the foundation stage, our aim is that children acquire the following substantive knowledge to prepare them for the Computing curriculum in KS1: • to know the names of basic technology equipment eg tablet, monitor, whiteboard, programmable robots • to know that technology can be used in a wide range of ways in their environment • to know and talk about the different factors that support their overall health and wellbeing, eg sensible amounts of 'screen time' • to know that digital devices can be used to create pictures • to know that things can be similar or different in lots of ways and can talk about some of these similarities and differences • to know that typing using a keyboard is another way of writing information	**Unit 1.1 – Online Safety** • Knows how to log in safely. • Knows how to navigate to a document area where saved work by child can be found. • Knows how to use search to locate applications or resources on a platform such as Purple Mash. • Knows how to enhance work by adding multimodal items such as text and images. • Knows how to open, save and print work. • Knows the importance of logging out of an account. **Unit 1.2 – Grouping & Sorting** • Knows how to sort items using a range of criteria. • Knows how to use software for grouping items such as tools within Purple Mash. **Unit 1.6 – Animated Story Books** • Knows what e-books are. • Knows of software such as 2Create a Story that allows users to create interactive stories. • Knows how to add animation to an interactive story. • Knows how to add sound, including voice recordings and music to a story they have created using software. • Beginning to know how to work on more complex digital stories, including adding backgrounds, copying and pasted pages. • Knows how to share digital stories with others such as using Digital Display Boards.

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		Key Vocabulary: Alert, avatar, button, device, file name, icon, log in, log out, menu, my work, notification, private, password Criteria, groups, sort, algorithms Animation, background, clip-art gallery, e-books, edit, font, sound, sound effect, text
Spring Term		**Unit 1.3 - Pictograms** • Knows that data can be represented in a picture format e.g. pictogram. • Knows how to contribute to a class pictogram. • Knows how to use a software such as 2Count to record results of an experiment into a pictogram format. **Unit 1.4 – Lego Builders** • Knows how to compare the effects of adhering strictly to instructions when completing tasks without complete instructions. • Knows how to follow and create simple instructions on the computer. • Knows that the order of instructions affects the end result for a given instructional task. **Unit 1.5 – Maze Explorers** • Knows the functionality of the direction keys in 2GO. • Knows how to create and debug a set of simple instructions (algorithm). • Knows how to use the additional direction keys within 2Go as part of an algorithm. • Knows how to change and extend the algorithm list in 2Go
		Key Vocabulary: Collect data, compare, data, pictogram, record results, title Algorithm, code, computer, debugging, instructions, program

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		Algorithms, challenge, command, direction, instruction, left and right, route, undo, unit
Summer Term		**Unit 1.7 – Coding** • Knows what instructions are and can predict what might happen when they are followed. • Knows how to plan and make a simple computer program e.g. fish moves right, crab moves up. • Knows what objects, actions and backgrounds are within a coding environment. • Knows what an event is and knows how to use an event to control an object. • Beginning to know how code executes when a program is run. **Unit 1.8 – Spreadsheets** • Knows what a spreadsheet program environment looks like including cells, rows and columns. • Knows basically what a spreadsheet program can help do. • Knows how to enter data into spreadsheet cells. • Knows how to add images to cells. • Knows how to use some tools within spreadsheets e.g. with 2Calulate can use lock cell, move cell, speak and count. **Unit 1.9 – Tech Outside School** • Knows that technology is a use of knowledge to invent new devices or tools. • Knows that throughout history, technology has made people's lives easier. • Knows that technology is used within school and outside of school. • Knows where examples of technology can be found both in and out of school.

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		Key Vocabulary: Action, algorithm, background, code, coding, command, debug/debugging, event, execute, instruction, object, output, plan, programmer, properties, run Button, calculations, cell, clip-art, column, count tool, data, delete, image, lock cell, move cell, row, speak tool, spreadsheet, value Computer, technology

	Year 1	Year 2
Substantive Knowledge (Declarative)		
Autumn Term	**Unit 1.1 – Online Safety** • Knows how to log in safely. • Knows how to navigate to a document area where saved work by child can be found. • Knows how to use search to locate applications or resources on a platform such as Purple Mash. • Knows how to enhance work by adding multimodal items such as text and images. • Knows how to open, save and print work. • Knows the importance of logging out of an account. **Unit 1.2 – Grouping & Sorting** • Knows how to sort items using a range of criteria.	**Unit 2.2 – Online Safety** • Knows how searches can be refined when searching digitally and therefore attempts refining when searching. • Knows that digitally created work can be shared with others e.g. Purple Mash Display Boards. • Has knowledge and understanding about sharing more globally on the Internet. • Knows that email is a type of communication tool. • Knows how to open and send simple online communications in the form of email e.g. 2Email (virtual email client). • Knows that there is an appropriate way to communicate with others in an online situation. • Knows that information put online leaves a digital footprint.

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- Knows how to use software for grouping items such as tools within Purple Mash.

Unit 1.6 – Animated Story Books

- Knows what e-books are.
- Knows of software such as 2Create a Story that allows users to create interactive stories.
- Knows how to add animation to an interactive story.
- Knows how to add sound, including voice recordings and music to a story they have created using software.
- Beginning to know how to work on more complex digital stories, i+ncluding adding backgrounds, copying and pasted pages.
- Knows how to share digital stories with others such as using Digital Display Boards.

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- Knows some steps that can be taken to keep personal data and hardware secure.

Unit 2.5 – Effective Searching

- Knows the meaning of key Internet and searching terms.
- Knows the basic parts of a web search engine page.
- Knows how to navigate a web search results page.
- Knows how to search the Internet to some degree for answers to a quiz.
- Knows the premise of what effective Internet searching is.

Unit 2.8 – Presenting Ideas

- Know that digital content can be presented in many different forms e.g. stories.
- Know how to use presentational or interactive software such as a quiz, making improvements to it based on people feedback.
- Know that data can be structured in tables to make it useful for an audience.
- Know how to add images such as clipart and photos to presentational software.
- Know how to collect, organise and present data and information in digital format.

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Key Vocabulary:

Alert, avatar, button, device, file name, icon, log in, log out, menu, my work, notification, private, password
Criteria, groups, sort, algorithms
Animation, background, clip-art gallery, e-books, edit, font, sound, sound effect, text

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Key Vocabulary:

Search, display boar, internet, sharing, email, attachment, digital footprint

Internet, search, search engine

Concept map (mind-map), node, animated, quiz, non-fiction, presentation, narrative, audience

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<td>Spring Term</td>
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Unit 1.3 - Pictograms

- Knows that data can be represented in a picture format e.g. pictogram.
- Knows how to contribute to a class pictogram.

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Unit 2.1 – Coding

- Knows what an algorithm is and can explain that it is a set of instructions and that algorithms follow a sequence.
- Knows how to create a computer program using an algorithm.

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	• Knows how to use a software such as 2Count to record results of an experiment into a pictogram format. **Unit 1.4 – Lego Builders** • Knows how to compare the effects of adhering strictly to instructions when completing tasks without complete instructions. • Knows how to follow and create simple instructions on the computer. • Knows that the order of instructions affects the end result for a given instructional task. **Unit 1.5 – Maze Explorers** • Knows the functionality of the direction keys in 2GO. • Knows how to create and debug a set of simple instructions (algorithm). • Knows how to use the additional direction keys within 2Go as part of an algorithm. • Knows how to change and extend the algorithm list in 2Go	• Knows how to create a computer program from a given design. • Knows that collision detection is an event type in coding. • Knows how to design an algorithm that follows a timed sequence. • Knows that different objects within the coding environment have different properties. • Knows that there are different events in coding and knows what some of these events are. • Knows the function of buttons in the coding environment. • Knows how to interpret and debug simple programs. **Unit 2.4 – Questioning** • Knows that pictograms provide limited information. • Knows that there are other data handling tools that can give more information than pictograms. • Knows how to use yes/no questions to separate information. Knows how to construct a binary tree to identify items. • Knows how to use a binary tree database (such as 2Question), to answer questions. • Knows how to use a database to answer more complex search questions. • Knows how to use a search feature at a basic level when trying to locate data within a database such as 2Investigate.
	Key Vocabulary: Collect data, compare, data, pictogram, record results, title Algorithm, code, computer, debugging, instructions, program Algorithms, challenge, command, direction, instruction, left and right, route, undo, unit	**Key Vocabulary:** **Object, predict, properties, run, scale, scene, sequence, sound, test, text, timer, when clicked/swiped** **Pictogram, question, data, collate, binary tree, avatar, database**
Summer Term	**Unit 1.7 – Coding** • Knows what instructions are and can predict what might happen when they are followed. • Knows how to plan and make a simple computer program e.g. fish moves right, crab moves up.	**Unit 2.3 – Spreadsheets** • Secures knowledge from prior year when spreadsheets were introduced (See unit 1.8).

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	• Knows what objects, actions and backgrounds are within a coding environment. • Knows what an event is and knows how to use an event to control an object. • Beginning to know how code executes when a program is run. **Unit 1.8 – Spreadsheets** • Knows what a spreadsheet program environment looks like including cells, rows and columns. • Knows basically what a spreadsheet program can help do. • Knows how to enter data into spreadsheet cells. • Knows how to add images to cells. • Knows how to use some tools within spreadsheets e.g. with 2Calulate can use lock cell, move cell, speak and count. **Unit 1.9 – Tech Outside School** • Knows that technology is a use of knowledge to invent new devices or tools. • Knows that throughout history, technology has made people's lives easier. • Knows that technology is used within school and outside of school. • Knows where examples of technology can be found both in and out of school.	• Knows how to use prior learning to perform composite task of creating a counting machine using software such as 2Calculate (image, lock move cell, speak and count tools). • Knows how to copy, cut and paste in spreadsheet software such as 2Calculate. • Knows what totalling tools are and how to use them. • Knows how to use a spreadsheet to perform calculations for purpose. For example, adding and totalling money. • Knows how to use some tools within a spreadsheet to support calculations. For example, using the equals tool in 2Calculate to check calculations. • Knows how to create a manual block graph within a spreadsheet from data. **Unit 2.6 – Creating Pictures** • Knows the purpose and benefits of painting software tools such as 2Paint a Picture. • Knows how to recreate Impressionism, surrealism and Pointillism using features within 2Paint a Picture. • Knows how to reproduce the style of William Morris by using repeating patterns, manipulating patterns and adding multiple effects in painting software such as 2Paint a picture. **Unit 2.7 – Making Music** • Knows how to make forms of music (digitally) using age-appropriate software such as 2Sequence. • Knows how to edit and combine sounds using • 2Sequence. • Knows how to refine composed music. • Knows how to upload/import and record sounds beyond the software environment
	Key Vocabulary: Action, algorithm, background, code, coding, command, debug/debugging, event, execute, instruction, object, output, plan, programmer, properties, run	**Key Vocabulary:** Backspace key, copy and paste, columns, cells, count tool, delete key, equals tool, image toolbox, lock tool, move cell tool, rows, speak tool, spreadsheet

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	Button, calculations, cell, clip-art, column, count tool, data, delete, image, lock cell, move cell, row, speak tool, spreadsheet, value Computer, technology	Impressionism, pallet, pointillism, share, surrealism, template, Bpm, composition, digitally, instrument, music, sound effects (SFX), sound track, tempo, volume

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	EYFS	Year 1	Year 2	Year 3
Disciplinary Knowledge (Procedural)				
Computer science	- I can talk about where I am moving a toy vehicle whilst I am moving it. - I can describe the route taken by a toy vehicle. - I can follow directions to make a route for a toy vehicle. - I can make a floor robot move.	- I can apply a logical process when sorting and grouping a range of objects (1.2) - I can explain that an algorithm is a set of instructions. (1.4, 1.5) - I know that a computer program turns an algorithm into code that the computer can understand. (1.4, 1.7) - I can work out what is wrong when the steps are out of order in instructions. (1.4, 1.5) - I can say that if something does not work how it should it is because my code is incorrect. (1.7) - I can try and fix my code if it isn't working properly. (1.7) - I can make good guesses of what is going to happen in a program. For example, where the turtle might go. (1.5, 1.7)	- I can explain an algorithm is a set of instructions to complete a task.(2.1) - I know I need to carefully plan my algorithm so it will work when I make it into code.(2.1) - I can design a simple program using 2Code that achieves a purpose.(2.1) - I can find and correct some errors in my program. (2.1) - I can say what will happen in a program. (2.1) - I can spot something in a program that has an action or effect (does something). (2.1)	- I can make a real-life situation into an algorithm for a program. (3.1) - I can design an algorithm carefully, thinking about what I want it to do and how I can turn it into code. (3.1) - I can identify an error in my program and fix it. (3.1) - I can experiment with timers in my programs. (3.1) - I can identify the difference in using the effect of a timer or repeat command in my code. (3.1) - I know that a variable stores information while a program is running (executing). (3.1) - I can identify 'If' statements, repetition and variables. (3.1) - I can read programs with several steps and predict what they will do. (3.1)

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Information Technology	- I can hold a computer mouse with my finger on the correct buttons. - I can use a mouse to make the cursor move around the computer screen where I want it to go. - I can click the correct mouse button to play games on the computer. - I can select colours when painting on the computer. - I can use a computer to draw with different widths of pens. - I can try the different tools that I can draw with on the computer. - I can draw on a computer using a mouse.	- I can know what sound, pictures and text are. (1.2) - I can add sound, pictures and text to a program such as 2Create a Story. (1.6) - I can change content on a file such as text, sound and images (1.3, 1.6, 1.7, 1.8) - I can name my work. (1.2, 1.3, 1.6, 1.7, 1.8) - I can save my work. (1.2, 1.3, 1.6, 1.7, 1.8) - I can find my work. (1.2, 1.3, 1.6, 1.7, 1.8)	- I can organise data – for example, using a database such as 2Investigate. (2.3, 2.4) - I can find data using specific searches – for example, using 2Investigate. - (2.4, also links to internet searching) - I can use several programs to organise information – for example, using binary trees such as 2Question or spreadsheets such as 2Calculate. (2.4, 2.8) - I can edit digital data such as data in music composition software like 2Sequence. (2.7 and most units) - I can name, save and find my work. (most units) - I can include photos, text and sound in my creations. (2.8, 2.6)	- I can carry out searches to find digital content on a range of online systems, such as within Purple Mash or on an internet search engine. (Across units) - I can collect data and input it into software. (3.3, 3.6, 3.8) - I can analyse data using features within the software, such as formulae in 2Calculate (spreadsheets). (3.3, 3.6, 3.8) - I can present data and information using different software such as 2Question (branching database) or 2Graph (graphing tool). (3.3, 3.6, 3.8,3.9) - I can consider what the most appropriate software to use when given a task by my teacher. (Across units) - I can create purposeful (appropriate) content and attach this to emails.

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Digital Literacy	- I can use devices with care. - I can identify the technology used around me. - I can talk about what technology is used at home. - I can talk about what technology is used outdoors. - I can talk about what technology is used in the world around me. - I can explain how my work on the computer belongs to me and other people's work belongs to them. - I can explain what it means for something to be private.	- I can say what technology is. (1.9) - I can say what examples of technology are in school. (1.9) - I can say what examples of technology are at home. (1.9) - I know that a chair uses old technology and a smartphone uses new technology. (1.9) - I can keep my login information safe. (1.1 and most units) - I can save my work in a safe place such as 'My Work' folder	- I can find the information I need using a search engine. (2.5) - I know the consequences of not searching online safely. (2.2, 2.5) - I can share work and communicate electronically – for example, using 2Email or the display boards. - (2.2 and others) - I can report unkind behaviour and things that upset me online, to a trusted adult. (2.2) - I can see where technology is used at school such as in the office or canteen. (2.2) - I understand that my creations such as programs in 2Code, need similar skills to the adult world. e.g. The program used for collecting money for school trips. (2.1)	- I can create a secure password. (3.2) - I can explain the importance of having a secure password and not sharing it with others. (3.2, 3.5) - I can explain the negative consequences of not keeping passwords safe and secure.(3.2, 3.5) - I understand the importance of keeping safe online and behaving respectfully. (3.2) - I can identify different ways that the internet can be used for communication. (3.5) - I can use email such as 2Email to respond to others appropriately and attach files. (3.5) - I can report unacceptable content and contact online in more than one way to a trusted adult. (3.2) - I can use communication tools such as 2Email respectfully and use good etiquette. (3.2, 3.5)