Curriculum Guidance

Computing

At Cannon Park, we encourage **excellence and enjoyment** by being our best and caring for all in a safe environment every day!

Teamwork Respect Integrity Enjoyment Discipline

Cannon Park Primary School – Computing Curriculum
Encouraging Excellence

In line with our school vision, at Cannon Park, we aim to offer a broad and balanced curriculum, which enables children to develop in excellence both in skills and knowledge across all areas of the curriculum as well as promoting cultural, social, spiritual and physical development growth. We want children to enjoy their learning, develop a love of learning and leave Cannon Park as life-long learners, ready for their next step in life.

The happiness, well-being and achievement of each child is our main concern and we believe that every child can achieve and succeed in reaching their full potential. We provide a safe, vibrant and energetic environment with very high standards and expectations of conduct and discipline. There is a genuine caring ethos with a focus on our core TRIED values: Teamwork, Respect, Integrity, Enjoyment, Discipline.

Through our engaging values-led curriculum, we strive to deliver the best learning opportunities and challenges that we can, to evoke that love of learning. Our curriculum has been developed with our children in mind, celebrating the best of Coventry as well as developing an understanding of the wider world and our diverse community. Our pupils are delightful, and we encourage them to aim high, achieve excellence through enjoyment.

Values

Teamwork	Together everyone achieves more. We want children to understand the importance of working as part of team. We work in partnership with our community, helping children understand their place in the community.
Respect	Treating others how you would like to be treated. We want children to respect themselves and others as well as learning to respect the environment.
Integrity	Doing the right thing even when no one is looking. Doing the right thing is an important message to teach our children. We want them to learn from positive examples throughout history of figures who have done the right thing, even when it was challenging.
Enjoyment	Having fun, but not at the expense of others. Our children have told us that they learn best when they are enjoying themselves. Parents have told us that their children come home from school talking about new experiences. We want to ensure our curriculum provides children with these opportunities.
Discipline	Doing what needs to be done, even when you don't feel like doing it. Having discipline in learning is essential to progress. We want children to develop discipline across the full curriculum.

At Cannon Park, we aim to provide high quality learning experiences for the children. Across the school, we agree on **three core elements to learning**:

Engage	We provide engaging resources to hook the children into their learning. Links are made to previous learning to ensure the skills and knowledge are connected. Educational trips and visits to enhance the learning. From pupil and parent voice, we know that our children learn best when they are engaged. This makes the learning experience memorable and helps it stay in long term memory.
Apply	Children lead the learning – they 'give it a go' – with personalised learning, which is pitched appropriately to meet the needs of all children. Children are given time to apply their learning. During this time, the teacher supports the learning where necessary while assessing the learning. New learning is presented in small steps. All children have Learning Partners to enable them to support each other in their learning. High quality questioning guides children in their learning, with a focus on process rather than outcome. Children are supported with new vocabulary. EEF research states that effective collaborative learning gains an additional 5 months of learning. EEF research states that thinking skills gains an additional 8 months of learning.
Reflect	Children are given time to reflect on their own learning. Learning Partners feedback during the lesson. We use assessment for learning to celebrate success and move the learning on. We identify who understands the concept and who needs further support. Adults support children to secure their learning at the earliest opportunity to ensure children catch up and keep up with the learning. The next learning steps are informed by the current learning. EEF research states that effective feedback on learning gains an additional 7 months of learning.

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Curriculum Guidance		
Intent	**Implementation**	**Impact**
Children develop socially and emotionally as well as academically.	○ Strong school values of *Teamwork, Respect, Integrity, Enjoyment and Discipline,* which are embedded in everything we do, are used to help the children grow into well-rounded individuals. ○ Learning Partners are used to encourage children to work collaboratively and support each other in their learning. ○ Strong PSHE curriculum, which is based around the PSHE association, teaches children the skills and knowledge needed to develop socially and emotionally. ○ Highly skilled Learning Mentor able to support children when necessary. ○ Child-independence is developed from Reception to Year 6	Children develop positive relationships with their peers and with the adults in school. Children are able to communicate clearly their opinions, knowledge and emotions. Pupil Voice shows 92% of children feel happy in school. Behaviour, including learning behaviour, is excellent. Children feel safe and happy in school. All children understand and demonstrate our school values. Pupil Voice shows 90% of children believe children follow our school values and behave well.
Across the curriculum, children learn new skills and acquire knowledge in a progressive manner as they move through the school, building on previous learning.	○ Each curriculum area has a clear skills and knowledge progression document to enable teachers to plan learning which builds on prior knowledge. ○ Children are encouraged to think about what they already know to help them with their current learning. ○ Staff work collaboratively on planning the long term curriculum to ensure year groups or content are not viewed in isolation. ○ Subject leads monitor progress in their subject termly through book looks, learning walks, staff and pupil voice as well as data analysis.	In each subject, children acquire new knowledge and develop new skills in a progressive manner. Children are able to articulate what they have been learning about and why they have been learning about it. Pupil Voice shows 93% of children believe they make good progress.
All children are included in the learning and provided with appropriate challenge for their abilities and needs.	○ Learning resources are personalised by the teachers for the children in their class. Questions, activities and challenges are planned to include all children, including those with SEND. ○ Lessons are focused on the children with adults facilitating learning. ○ Adults value process over product.	All children are challenged in every lesson. Children are active learners, keen to find out more. Parent/Carer Voice shows 84% of parents/carers believe their child receives appropriate support. SEND children make comparative or better progress in reading, writing and mathematics than children without SEND.
Children are engaged in and enjoy their learning.	○ Teachers take into account different learning styles of the children in their class and plan a range of activities to engage children. ○ Teachers understand that if children enjoy their learning, they are more likely to be engaged and learn. Lessons reflect this.	Children show a love of learning. Through a broad and balanced curriculum, children have the opportunity to find where their talents and interests lie. Pupil Voice shows 93% of children enjoy their learning and 95% of children would recommend Cannon Park Primary School to another child.

Cannon Park Primary School – Computing Curriculum
Encouraging Excellence

Computing Intent:

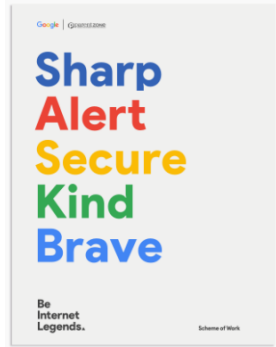
- To teach the children how to keep themselves safe online
- Children can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms, and data representation.
- Children can analyse problems in computational terms and have repeated practical experience of writing computer programs in order to solve such problems.
- Children can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems.
- Children are responsible, competent, confident, and creative users of information and communication technology.
- Computing is for all children.

Computing Implementation:

At Cannon Park Primary School, we follow The Teach Computing Curriculum. The Teach Computing Curriculum was created by the Raspberry Pi Foundation on behalf of the National Centre for Computing Education (NCCE). The materials are suitable for all pupils irrespective of their skills, background, and additional needs.

Our curriculum implements physical computing as it plays an important role in modern pedagogical approaches with the subject and wider world, both as a tool to engage pupils and as a strategy to develop pupils' understanding in more creative ways. Additionally, physical computing supports and engages a diverse range of pupils in tangible and challenging tasks. To support and further invest in the development of its pupils, Cannon Park have invested in Micro-Bit computers, Tablets, floor robots and Chromebooks.

School takes Online Safety very seriously. Cannon Park follows Google Internet Legends which provides children with crucial knowledge. We also conduct termly training with staff to ensure everyone remains up to date with changes identified. Parents are given the opportunity to learn about online safety through online workshops. We also have an Online Safety Day where the entire school takes part in a wide range of activities to support all children in developing their knowledge of Online Safety.



The Teach Computing Curriculum has been written to support all pupils. Each lesson is sequenced so that it builds on the learning from the previous lesson, and where appropriate, activities are scaffolded so that all pupils can succeed and thrive. Scaffolded activities provide pupils with extra resources, such as visual prompts, to reach the same learning goals as the rest of the class. Exploratory tasks foster a deeper understanding of a concept, encouraging pupils to apply their learning in different contexts and make connections with other learning experiences.

Progression

All learning objectives have been mapped to the National Centre for Computing Education's taxonomy of ten strands, which ensures that units build on each other from one key stage to the next. Within the Teach Computing Curriculum, every year group learns through units within the same four themes, which combine the ten strands of the National Centre for Computing Education's taxonomy. Learning graphs are provided as part of each unit and demonstrate progression through concepts and skills. In order to learn some of those concepts and skills, pupils need prior knowledge of others, so the learning graphs show which concepts and skills need to be taught first and which could be taught at a different time.

Primary themes	Computing systems and networks	Programming	Data and information	Creating media
Taxonomy strands	Computer systems Computer networks	Programming Algorithms Design and development	Data and information	Creating media Design and development
	Effective use of tools			
	Impact of technology			
	Safety and security			

Pedagogy

Computing is a broad discipline, and computing teachers require a range of strategies to deliver effective lessons to their pupils. The National Centre for Computing Education's pedagogical approach consists of 12 key principles underpinned by research: each principle has been shown to contribute to effective teaching and learning in computing.

Foster program comprehension
Use a variety of activities to consolidate knowledge and understanding of the function and structure of programs, including debugging, tracing, and Parson's Problems. Regular comprehension activities will help secure understanding and build connections with new knowledge.

Create projects
Use project-based learning activities to provide pupils with the opportunity to apply and consolidate their knowledge and understanding. Design is an important, often overlooked aspect of computing. Pupils can consider how to develop an artefact for a particular user or function, and evaluate it against a set of criteria.

Add variety
Provide activities with different levels of direction, scaffolding, and support that promote learning, ranging from highly structured to more exploratory tasks. Adapting your instruction to suit different objectives will help keep all pupils engaged and encourage greater independence.

Challenge misconceptions
Use formative questioning to uncover misconceptions and adapt teaching to address them as they occur. Awareness of common misconceptions alongside discussion, concept mapping, peer instruction, or simple quizzes can help identify areas of confusion.

Make concrete
Bring abstract concepts to life with real-world, contextual examples, and a focus on interdependencies with other curriculum subjects. This can be achieved through the use of unplugged activities, proposing analogies, storytelling around concepts, and finding examples of the concepts in pupils' lives.

Structure lessons
Use supportive frameworks when planning lessons, such as PRIMM (Predict, Run, Investigate, Modify, Make) and (Use-Modify-Create). These frameworks are based on research and ensure that differentiation can be built in at various stages of the lesson.

Lead with concepts
Support pupils in the acquisition of knowledge, through the use of key concepts, terms, and vocabulary, providing opportunities to build a shared and consistent understanding. Glossaries, concept maps, and displays, along with regular recall and revision, can support this approach.

Work together
Encourage collaboration, specifically using pair programming and peer instruction, and also structured group tasks. Working together stimulates classroom dialogue, articulation of concepts, and development of shared understanding.

Get hands-on
Use physical computing and making activities that offer tactile and sensory experiences to enhance learning. Combining electronics and programming with arts and crafts (especially through exploratory projects) provides pupils with a creative, engaging context to explore and apply computing concepts.

Unplug, unpack, repack
Teach new concepts by first unpacking complex terms and ideas, exploring these ideas in unplugged and familiar contexts, then repacking this new understanding into the original concept. This approach, called 'semantic waves', can help pupils develop a secure understanding of complex concepts.

Model everything
Model processes or practices — everything from debugging code to binary number conversions — using techniques such as worked examples and live coding. Modelling is particularly beneficial to novices, providing scaffolding that can be gradually taken away.

Read and explore code first
When teaching programming, focus first on code 'reading' activities, before code writing. With both block-based and text-based programming, encourage pupils to review and interpret blocks of code. Research has shown that being able to read, trace, and explain code augments pupils' ability to write code.

Computing Impact:

Every lesson includes formative assessment opportunities for teachers to use. These opportunities are listed in the lesson plan and are included to ensure that misconceptions are recognised and addressed if they occur. They vary from teacher observation or questioning, to marked activities.

The learning objective and success criteria are introduced in the slides at the beginning of every lesson. At the end of every lesson, pupils are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. This gives pupils a reminder of the content that has been covered, as well as a chance to reflect. It is also a chance for teachers to see how confident the class is feeling so that they can make changes to subsequent lessons accordingly.

Pedagogically, when we assess, we want to ensure that we are assessing a pupil's understanding of computing concepts and skills, as opposed to their reading and writing skills. Therefore, we encourage observational assessment while pupils are still developing their literacy skills. We believe that this is the most reliable way to capture an accurate picture of learning.

Children leave Cannon Park Primary School confident and competent in computing skills with a thorough understanding of how to stay safe online.

Cannon Park Primary School – Computing Curriculum
Encouraging Excellence

Curriculum Overview

Year 1	Moving a robot (1.3)	Technology around us (1.1)	Digital painting (1.2)	Grouping data (1.4)	Digital writing (1.5)	Programming animations (1.6)
Year 2	Digital photography (2.2)	Information technology around us (2.1)	Digital music (2.5)	Pictograms (2.4)	Robot algorithms (2.3)	Programming quizzes (2.6)
Year 3	Connecting computers (3.1)	Stop-frame animation (3.2)	Sequencing sounds (3.3)	Branching databases(3.4)	Desktop publishing (3.5)	Events and actions in programs (3.6)
Year 4	The internet (4.1)	Repetition in shapes (4.3)	Audio Production (4.2)	Data logging (4.4)	Photo editing (4.5)	Repetition in games (4.6)
Year 5	Systems and searching (5.1)	Vector graphics (5.5)	Flat-file databases (5.4)	Physical computing (5.3)	Video production (5.2)	Selection in quizzes (5.6)
Year 6	Communication and collaboration (6.1)	Webpage creation (6.2)	Variables in games (6.3)	Introduction to spreadsheets (6.4)	3D modelling (6.5)	Sensing movement (6.6)

Computing systems and networks
Creating media
Programming
Data

Computing curriculum unit summaries

	Computing systems and networks	Creating media	Programming A	Data and information	Creating media	Programming B
Year 1	**Technology around us** Recognising technology in school and using it responsibly.	**Digital painting** Choosing appropriate tools in a program to create art, and making comparisons with working non-digitally.	**Moving a robot** Writing short algorithms and programs for floor robots, and predicting program outcomes.	**Grouping data** Exploring object labels, then using them to sort and group objects by properties.	**Digital writing** Using a computer to create and format text, before comparing to writing non-digitally.	**Programming animations** Designing and programming the movement of a character on screen to tell stories.
Year 2	**Information technology around us** Identifying IT and how its responsible use improves our world in school and beyond.	**Digital photography** Capturing and changing digital photographs for different purposes.	**Robot algorithms** Creating and debugging programs, and using logical reasoning to make predictions.	**Pictograms** Collecting data in tally charts and using attributes to organise and present data on a computer.	**Digital music** Using a computer as a tool to explore rhythms and melodies, before creating a musical composition.	**Programming quizzes** Designing algorithms and programs that use events to trigger sequences of code to make an interactive quiz.

	Computing systems and networks	Creating media	Programming A	Data and information	Creating media	Programming B
Year 3	**Connecting computers** Identifying that digital devices have inputs, processes, and outputs, and how devices can be connected to make networks.	**Stop-frame animation** Capturing and editing digital still images to produce a stop-frame animation that tells a story.	**Sequencing sounds** Creating sequences in a block-based programming language to make music.	**Branching databases** Building and using branching databases to group objects using yes/no questions.	**Desktop publishing** Creating documents by modifying text, images, and page layouts for a specified purpose.	**Events and actions in programs** Writing algorithms and programs that use a range of events to trigger sequences of actions.
Year 4	**The internet** Recognising the internet as a network of networks including the WWW, and why we should evaluate online content.	**Audio production** Capturing and editing audio to produce a podcast, ensuring that copyright is considered.	**Repetition in shapes** Using a text-based programming language to explore count-controlled loops when drawing shapes.	**Data logging** Recognising how and why data is collected over time, before using data loggers to carry out an investigation.	**Photo editing** Manipulating digital images, and reflecting on the impact of changes and whether the required purpose is fulfilled.	**Repetition in games** Using a block-based programming language to explore count-controlled and infinite loops when creating a game.

Year 5	**Systems and searching** Recognising IT systems in the world and how some can enable searching on the internet.	**Video production** Planning, capturing, and editing video to produce a short film.	**Selection in physical computing** Exploring conditions and selection using a programmable microcontroller.	**Flat-file databases** Using a database to order data and create charts to answer questions.	**Introduction to vector graphics** Creating images in a drawing program by using layers and groups of objects.	**Selection in quizzes** Exploring selection in programming to design and code an interactive quiz.
Year 6	**Communication and collaboration** Exploring how data is transferred by working collaboratively online.	**Webpage creation** Designing and creating webpages, giving consideration to copyright, aesthetics, and navigation.	**Variables in games** Exploring variables when designing and coding a game.	**Introduction to spreadsheets** Answering questions by using spreadsheets to organise and calculate data.	**3D modelling** Planning, developing, and evaluating 3D computer models of physical objects.	**Sensing movement** Designing and coding a project that captures inputs from a physical device.

National Curriculum Coverage

National Curriculum Coverage — Years 1 and 2	1.1 Technology around us	1.2 Digital painting	1.3 Moving a robot	1.4 Grouping data	1.5 Digital writing	1.6 Programming animations	2.1 Information technology around us	2.2 Digital photography	2.3 Robot algorithms	2.4 Pictograms	2.5 Digital music	2.6 Programming quizzes
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	✓			✓	✓		✓	✓	✓	✓		

National curriculum coverage - Years 3 and 4	3.1 Connecting computers	3.2 Stop-frame animation	3.3 Sequencing sounds	3.4 Branching databases	3.5 Desktop publishing	3.6 Events and actions in programs	4.1 The internet	4.2 Audio production	4.3 Repetition in shapes	4.4 Data logging	4.5 Photo editing	4.6 Repetition in games
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		✓		✓			✓	✓			✓	

National curriculum coverage - Years 5 and 6	5.1 Systems and searching	5.2 Video production	5.3 Selection in physical computing	5.4 Flat-file databases	5.5 Introduction to vector graphics	5.6 Selection in quizzes	6.1 Communication and collaboration	6.2 Webpage creation	6.3 Variables in games	6.4 Introduction to spreadsheets	6.5 3D modelling	6.6 Sensing movementz
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	✓	✓						✓	✓		✓	