



# The Willows Primary School

## Computing Curriculum



<b>Subject Leader</b>	<b>Mr Dave Byrne</b>
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### INTENT

At The Willows, we recognise that technology is everywhere and will play a pivotal part in students' lives. Therefore, we want to model and educate our pupils to give them the **SELF-BELIEF** to use technology positively, responsibly and with **CARE**. We want to **CHALLENGE** our pupils to be creators not consumers and our broad curriculum encompassing computer science, information technology and digital literacy reflects this. We want our pupils to understand that there is always a choice with using technology for which they need to take **RESPONSIBILITY**, and as a school, we utilise technology to model positive use.

We recognise that the best prevention for a lot of issues we currently see with technology/social media is through education. We recognise that technology can allow pupils to share their learning in creative ways. We also understand the accessibility opportunities technology can provide for our pupils. Our knowledge rich curriculum has to be balanced with the opportunity for pupils to apply their knowledge creatively which will in turn help our pupils become skilful, **RESPONSIBLE** computer scientists. We encourage staff to try and embed computing across the whole curriculum to make learning creative and accessible. We want our pupils to be fluent with a range of tools to best express their understanding and hope that by the time our children leave us, they have the independence and confidence to choose the best tool to fulfil the task and **CHALLENGE** set by teachers.

### IMPLEMENTATION

Our whole curriculum is shaped by our school vision which aims to provide opportunities for all our children to develop their full potential through high quality education and a caring environment where high standards are set and expected. We teach the National Curriculum, supported by a clear skills and knowledge progression. This ensures that skills and knowledge are built on year by year and sequenced appropriately to maximise learning for all children.

To ensure a broad range of skills and understanding, Computing is taught across three main strands: digital literacy, computer science and



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information technology.

As part of information technology, children learn to use and express themselves and develop their ideas through ICT for example writing and presenting as well as exploring art and design using multimedia. Within digital literacy, children develop practical skills in the safe use of ICT and the ability to apply these skills to solving relevant, worthwhile problems for example understanding safe use of the internet, networks and email. In computer science, we teach children to understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation. Also to analyse problems to computational terms, and have repeated practical experience of writing computer programs in order to solve such problems. We also teach a progression of Computing vocabulary to support children in their understanding.

At The Willows, we give children access to a wide range of good quality resources and provide cross curricular opportunities for children to apply their Computing knowledge and skills. Online safety is taught throughout the year. Our Digital Leaders assist both children and staff in the delivery of the curriculum, but will also run extra curricular clubs and assemblies. Online safety procedures are communicated with all staff and parents.



What is taught when?						
	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Half Term 1 Computing systems and networks</b>	Technology around us Recognising technology in school and using it responsibly	Information technology around us Identifying IT and how its responsible use improves our world in school and beyond.	Connecting computers Identifying that digital devices have inputs, processes, and outputs, and how devices can be connected to make networks.	The internet Recognising the internet as a network of networks including the WWW, and why we should evaluate online content.	Systems and searching Recognising IT systems in the world and how some can enable searching on the internet.	Communication and collaboration Exploring how data is transferred by working collaboratively online.
<b>Online Safety Focus</b>	Online Bullying & Health, Wellbeing and Lifestyle					
<b>Half Term 2 Creating media</b>	Digital painting Choosing appropriate tools in a program to create art, and making comparisons with working non-digitally	Digital photography Capturing and changing digital photographs for different purposes.	Stop-frame animation Capturing and editing digital still images to produce a stop-frame animation that tells a story.	Audio production Capturing and editing audio to produce a podcast, ensuring that copyright is considered.	Video production Planning, capturing, and editing video to produce a short film.	Webpage creation Designing and creating webpages, giving consideration to copyright, aesthetics, and navigation.
<b>Online Safety Focus</b>	Self Image and Identity & Online Reputation					
<b>Half Term 3 Programming A</b>	Moving a robot Writing short algorithms and programs for floor robots, and predicting program outcomes.	Robot algorithms Creating and debugging programs, and using logical reasoning to make predictions.	Sequencing sounds Creating sequences in a block-based programming language to make music	Repetition in shapes Using a text-based programming language to explore count-controlled loops when drawing shapes.	Selection in physical computing Exploring conditions and selection using a programmable microcontroller.	Variables in games Exploring variables when designing and coding a game.
<b>Online Safety</b>	Managing Online Information					



<b>Half Term 4 Data and information</b>	Grouping data Exploring object labels, then using them to sort and group objects by properties.	Pictograms Collecting data in tally charts and using attributes to organise and present data on a computer.	Branching databases Building and using branching databases to group objects using yes/no questions.	Data logging Recognising how and why data is collected over time, before using data loggers to carry out an investigation.	Flat-file databases Using a database to order data and create charts to answer questions.	Introduction to spreadsheets Answering questions by using spreadsheets to organise and calculate data
<b>Online Safety Focus</b>	Managing Online Information					
<b>Half Term 5 Creating media</b>	Digital writing Using a computer to create and format text, before comparing to writing non-digitally.	Digital music Using a computer as a tool to explore rhythms and melodies, before creating a musical composition.	Desktop publishing Creating documents by modifying text, images, and page layouts for a specified purpose	Photo editing Manipulating digital images, and reflecting on the impact of changes and whether the required purpose is fulfilled.	Introduction to vector graphics Creating images in a drawing program by using layers and groups of objects.	3D modelling Planning, developing, and evaluating 3D computer models of physical objects.
<b>Online Safety</b>	Online Relationships					
<b>Half Term 6 Programming B</b>	Programming animations Designing and programming the movement of a character on screen to tell stories.	Programming quizzes Designing algorithms and programs that use events to trigger sequences of code to make an interactive quiz.	Events and actions in programs Writing algorithms and programs that use a range of events to trigger sequences of actions.	Repetition in games Using a block-based programming language to explore count-controlled and infinite loops when creating a game.	Selection in quizzes Exploring selection in programming to design and code an interactive quiz.	Sensing movement Designing and coding a project that captures inputs from a physical device.
<b>Online Safety Focus</b>	Privacy and Security & Copyright and Ownership					



### Knowledge and Skills Prior to KS1 - Computing in EYFS

Although there are no early learning goals directly related to ICT at The Willows we take a holistic approach as we believe it is an integral part of the children's everyday life. Children therefore have ICT experience across the provision and links to how ICT is used in the world we live in are established.

Here at The Willows, we strongly believe that immersing the children in computing and technology as part of their continuous provision enables us to help develop the seven areas of learning, with particular emphasis on Personal, Social and Emotional Development; Physical Development; Understanding the World; and Expressive Art and Design.

A range of technology is available for children to use including:

- Tablets
- Cameras
- Walkie Talkies
- Torches
- Talking Buttons
- Beebots
- Interactive Touch Screen Display

Access to such items allow children to feed their curiosity and see how things work (*Understanding the World*), as well as encouraging them to try new activities and show independence, resilience and perseverance in the face of challenges (*Personal, Social and Emotional Development*).

One example would be through the use of Beebots. Independently accessing and following verbal rules recorded on sound buttons (again, *Personal, Social and Emotional Development*), children are encouraged to program the Beetbot to carry out certain tasks. This not only encourages collaboration, but also requires the children to deploy their fine motor skills to use this technology competently (*Physical Development*). By attaching pens to the Beebots, children can explore and investigate how to create shapes and patterns (*Expressive Arts and Design*), and can then use other technologies to record their work.



Skills and Knowledge Progression					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Computer Science</b>					
<p>Begin to develop an understanding of algorithms</p> <p>Begin to understand that programs work by following instructions</p> <p>Create simple programs and begin to debug them</p> <p>Develop reasoning to predict the behaviour of simple programs</p>	<p>Understand what algorithms are</p> <p>Understand how algorithms are implemented as programs on digital devices</p> <p>Understand that programs execute by following precise and unambiguous instructions</p> <p>Use logical reasoning to predict the behaviour of simple programs Create and debug simple programs</p>	<p>Start to use reasoning to understand how algorithms work</p> <p>Detect errors in algorithms and programs</p> <p>Begin to solve problems by decomposing them into smaller parts</p> <p>Start to use sequence and selection in programs</p> <p>Begin to develop understanding of how to write and debug programs that accomplish specific goals, including controlling or simulating physical systems</p>	<p>Communicate, generate and develop ideas using a range of strategies eg prototypes, pattern pieces</p> <p>Use research to inform design and develop design criteria</p> <p>Take risks to become innovative and resourceful</p>	<p>Communicate, generate, develop and model ideas using a range of strategies eg computer aided design, cross-sectional and exploded diagrams</p> <p>Use research to inform design and generate own design criteria</p> <p>Communicate, generate and develop ideas, drawing on other disciplines eg science, maths, computing</p> <p>Confidently take calculated risks to become innovative, resourceful and enterprising</p>	<p>Communicate, generate and develop ideas, drawing on other disciplines eg science, maths, computing</p> <p>Use research to inform innovative design and generate own design criteria</p> <p>Confidently take calculated risks to become innovative, resourceful and enterprising</p>



		Begin to work with various forms of input/output			
<b>Digital Literacy</b>					
Use technology to create, store and retrieve digital content	Use technology purposefully to create, store, retrieve, organise and manipulate digital content	Use a variety of software on digital devices	Select and use a variety of software on digital devices	Express own ideas by selecting, using and combining a variety of software on digital devices to design and create programs	Express own ideas by selecting, using and combining a variety of software on a range of digital devices and create programs
<b>Information Technology</b>					
Begin to recognise common uses of information technology beyond school	Recognise common uses of information technology beyond school	<p>Show emerging understanding of computer networks including the internet and how they provide multiple services such as the World Wide Web</p> <p>Use some search technologies effectively and appreciate how results are selected</p> <p>Decide which questions to ask when using search engines</p>	<p>-Understand computer networks including the internet and how they provide multiple services such as the World Wide Web</p> <p>-Use search technologies effectively and appreciate how results are selected and ranked</p> <p>Evaluate the reliability of digital content</p> <p>Begin to ask and answer</p>	<p>Recognise the opportunities computer networks offer for communication and collaboration</p> <p>Use a wide range of search technologies effectively and appreciate how results are selected and ranked</p> <p>Be discerning in evaluating the reliability of digital content</p>	<p>Use the opportunities computer networks offer for communication and collaboration</p> <p>Appreciate how results are selected and ranked and use this to retrieve accurate content</p> <p>Be discerning in evaluating the reliability of digital content</p>



			questions based on the reliability of digital content		
<b>E-Safety</b>					
Develop an understanding of how to use technology safely  Know where to go for help/support when they have concerns about content/contact on internet	Use technology safely and respectfully, keeping personal information private  Identify where to go for help/support when concerned about content/contact on internet/other online technologies	Use technology safely, respectfully and responsibly  Recognise acceptable/unacceptable behaviour and identify ways to report concerns about content and contact	Recognise acceptable/unacceptable behaviour and identify ways to report concerns about content and contact	Confidently, competently and responsibly use information and communication technology	Confidently, competently and responsibly use information and communication technology

Key Vocabulary Progression					
Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
algorithm control object debug instruction keyboard mouse coding online E-Safety Internet Technology	science coding task input program debug reset instruction source secure danger worried	variable character sprite error background object score execute behaviour concerns recognise respectfully	execute compile selection decomposition manipulate selection ranking software analyse reliability gather presentation	controlling election reasoning decomposing physical systems sensitive firewall unauthorised overlay chroma key	content retrieval strategy collaboration intuitive navigate literacy platform ranging accessibility opportunities resource



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### IMPACT

Computing has a high profile at our school. Our children are confident using a wide range of hardware and software, and are diligent learners who value online safety and respect when communicating with one another.

Our 'Digital Leaders' are growing in prominence and proficiency. These children are responsible for supporting staff and children in delivering excellent Computing sessions.

Our aim is for the children at The Willows to be digitally literate and able to join the rest of the world on its digital platform. They will be equipped, not only with the skills and knowledge to use technology effectively and for their own benefit, but more importantly – safely. The biggest impact we want on our children is that they understand the consequences of using the internet and that they are also aware of how to keep themselves safe online.

As children become more confident in their abilities in Computing, they will become more independent and key life skills such as problem-solving, logical thinking and self-evaluation become second nature.

If you were to walk into Computing lessons at The Willows, you would see:



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- Proficient users of technology who are able to work both independently and collaboratively.
- Computing hardware and software being utilised to enhance the learning outcomes of our children, across the curriculum.
- A clear progression in technical skills.
- Confident and supportive Digital Leaders who are able to assist children and staff in delivering high quality computing sessions.