

# Willow Lane Computing Curriculum

## Our intent

'Computing equips children to use computational thinking and creativity to understand and change the world' (DfE Computing curriculum). By engaging critically with how to use the internet and technology safely, and by teaching digital citizenship, children at Willow Lane are given the skills necessary to navigate an ever-changing digital world. Through the use of software to program apps, games and animations on iPads, children are taught how to resolve errors, find solutions and refine their choices. Computing lessons cover both how to safely use the internet and the fundamental programming principles that underpin computing. Importantly, Computing at Willow Lane is also interwoven through other subjects, whether that is using databases in science, publishing written work, making movie trailers of stories or using Green Screen technology to present news reports from space. This combination of skills and learning opportunities enables children to master essential computing skills, preparing them for computing in the 21st century.

## Implementation

Our computing curriculum is broken into 4 main strands:

- Understanding Technology (UT)
- Coding
- Information and Communication Technology (ICT)
- Online Safety

These strands may be taught independently or through other areas of the curriculum. They may also be interwoven to support children in developing a deep understanding of how the concepts and knowledge are linked and apply in different contexts. Our coding lessons are primarily supported by Discovery Coding. This introduces children to a wide range of coding and programming principles and gives them opportunities to create games and applications. We focus initially on block coding, but also explore HTML coding for children who are ready for more of a challenge. We also use other resources and applications to teach coding, including website design and Scratch Jr. ICT lessons are frequently taught through cross-curricular contexts to provide children with purposeful learning experiences. This may include using internet browsers to research for history lessons; creating presentations using Keynote app; data handling in science using Numbers app; or combing writing and images in Book Creator. Online safety is taught explicitly at the beginning of each year, in each year group. We use Project Evolve and Scarf resources to support high quality teaching and learning of online safety knowledge. We also regularly revisit this learning throughout ICT and HRE lessons as required to meet the needs of each class.



*Willow Lane*  
Community Primary School

# Assessment in Computing

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Understanding Technology	<p>Pupils recognise and can give examples of common uses of information technology they encounter in their daily routine.</p>	<p>Pupils recognise common uses of information technology beyond school, including those which they don't frequently encounter in their daily routine.</p> <p>Pupils understand that computers are not intelligent but can appear to be when following algorithms. They can share examples of this.</p>	<p>Pupils understand that computers (in various forms) generally accept inputs and produce outputs and can give examples of this.</p> <p>Pupils recognise - and can describe - some of the services offered by the Internet, especially those used for communication and collaboration.</p>	<p>Pupils develop a basic understanding of how computers can be linked to form a local network such as those found in schools.</p> <p>Pupils recognise that there is a difference between the Internet and the World Wide Web.</p> <p>They can recognise and describe some of the services offered by the Internet, especially those used for communication and collaboration.</p>	<p>Pupils know that there is a difference between the Internet and the World Wide Web and understand that the web is just one of the services offered by the Internet (as well as, e.g. email and VoIP services such as Skype).</p> <p>They appreciate how search results are ranked, including an understanding of the use of different algorithms to prioritise results.</p> <p>Pupils understand that the highest-ranking search results may not always be the most relevant. They appraise search results based on their relevance and trustworthiness, and can explain what is meant by 'fake news'</p>	<p>Pupils understand and can explain how computer networks work, including the Internet. They begin to understand how data travels across networks in packets and how these can be broken up and reconstructed.</p> <p>When accessing information online, pupils recognise that opinions may be presented as facts. They can describe why an opinion may easily become popular online but they understand that this doesn't necessarily make it true.</p> <p>They understand that some online content may be commercially sponsored such as adverts in search results or content presented by social media influencers.</p>
Coding	<p>Pupils create, debug and implement instructions (simple algorithms) as programs on a range of digital devices.</p> <p>Pupils understand that digital devices follow precise and unambiguous instructions.</p> <p>Pupils understand that digital devices can simulate real situations.</p>	<p>Pupils understand that algorithms are implemented as programs on digital devices.</p> <p>Pupils create and debug programs to achieve specific goals and understand the importance of sequence.</p> <p>Pupils use the principles of logical reasoning to plan and predict the behaviour of simple programs.</p> <p>Pupils solve problems on and off screen.</p>	<p>Pupils create programs to accomplish specific goals using an increasing range of digital devices and applications.</p> <p>They can decompose programs to test them and understand how making even small changes to an algorithm can have a significant impact on the outcome.</p> <p>They begin using simple repetition (e.g. 'repeat x times' and 'repeat forever') and understand how this can be used to improve efficiency in their programs.</p>	<p>Pupils create and debug programs containing simple repetition (e.g. 'repeat x times' and 'repeat forever') as well as more complex repetition (e.g. 'nested loops')</p> <p>Pupils increasingly use their programming capability to control or simulate a range of different outputs in physical systems.</p> <p>Pupils begin to explore and notice the similarities and differences between programming languages and use this knowledge to help them create and debug programs efficiently.</p>	<p>Pupils create, deconstruct and refine programs to accomplish specific goals.</p> <p>They create programs with loops which terminate when conditions are met or continue whilst conditions are present (e.g. 'repeat until' and 'repeat whilst').</p> <p>Pupils understand and use simple selection (e.g. if/then and if/then/else) to create interactive programs based on conditions being met / not met.</p> <p>They begin to use simple operators within their programs.</p>	<p>Pupils create, deconstruct and refine an increasingly complex range of programs to accomplish specific goals.</p> <p>Pupils create programs which store, change and report variables (e.g. scores in a game or time) and can include multiple variables in a single program.</p> <p>Pupils can explain why they have structured algorithms as they have and describe the effect this has on a program.</p>

# Assessment in Computing

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Information and Communications Technology	<p>With adult guidance, pupils use a range of technology to enhance and present their learning. Within both specific computing lessons and cross curricular contexts, pupils are able to:</p> <ul style="list-style-type: none"> <li>enquire with purpose, accessing digital content such as text, still and moving images, video and audio</li> <li>collect data (e.g. numerical, research facts etc.) which they are able to retrieve, store and present as graphs, tables and charts</li> <li>present and communicate their learning to others in a variety of ways using text, still images, video and audio, including combining 2 or more of these mediums</li> </ul>	<p>With increasing levels of autonomy, pupils are becoming confident and creative users of technology.</p> <p>Within both specific computing lessons and cross curricular contexts, pupils are able to:</p> <ul style="list-style-type: none"> <li>follow and expand on agreed lines of enquiry, using key words and phrases to effectively access digital content such as text, still images, video and audio</li> <li>identify, collect and manipulate different types of data (e.g. numerical, research facts etc.) which they present as information, showing a greater awareness of purpose and audience.</li> <li>present and communicate their learning to others in a variety of ways using text, still images, video and audio. They combine digital tools to achieve specific goals and think carefully about the impact on their audience.</li> </ul>	<p>Pupils are confident, capable and creative users of technology.</p> <p>Within both specific computing lessons and cross curricular contexts, pupils are able to:</p> <ul style="list-style-type: none"> <li>create and effectively follow lines of enquiry to support their learning, and are discerning in evaluating digital content they encounter</li> <li>identify, collect and analyse different types of data (e.g. numerical, words, images, video etc.) which they manipulate and re-present as information for a variety of audiences and purposes.</li> <li>select and make effective use of digital tools to create digital artefacts both under instruction and of their own choosing;</li> <li>decide on the most appropriate way to present their learning - thinking about aesthetics, functionality and impact on the user, and responding appropriately.</li> </ul>			
Online Safety	<p>Pupils are becoming increasingly aware of content, contact and conduct benefits and risks, how to manage them safely and where to go for help and support when they have concerns or feel unsafe, worried or upset.</p> <p>They are beginning to develop a better understanding of their own and others' 'identity' (including online), the importance of keeping personal information private and of seeking permission before sharing. They check with an adult before clicking on pop ups, notifications or dialogue boxes.</p> <p>They increasingly use a range of digital devices to communicate safely and respectfully online, making links to positive behaviour in the physical world.</p>	<p>Pupils are able to identify a range of content, contact and conduct benefits and risks, describe how to manage them safely and respectfully and know where to go for help and support when they have concerns.</p> <p>They can explain what is meant by 'identity', how this might be represented differently in different situations and why others might mis-represent their identity. They develop their understanding of 'trust' and the importance of being careful about what is shared online and of giving and gaining consent.</p> <p>Pupils can describe positive and negative effects of online activity / behaviours and begin to understand how to make safer and healthier decisions, including considering the appropriateness of games and online content for different ages.</p> <p>Pupils can describe positive ways for someone to interact with others online and understand how this will positively impact on how others perceive them.</p>	<p>Pupils identify and manage the benefits and risks of a range of online activities in terms of content, contact and conduct to ensure they are safe, respectful and responsible online. They know how to report concerns, seek support for themselves and others and persist until they get the help they need.</p> <p>Pupils make responsible choices about their own online identity and consider the potential impact of this on their digital footprint. They understand that online identities can be copied or modified and some of the possible implications of this.</p> <p>They can describe times when they might responsibly share personal information (including payment details), the importance of seeking permission and the need for strong passwords.</p> <p>They can describe ways technology may impact their own and others' physical and mental wellbeing (positively and negatively), understand their responsibilities in regard to this and can suggest a range of positive strategies to limit the negative impact of technology and online behaviours.</p>			

## Willow Lane Computing Curriculum Overview

Year group	Autumn		Spring		Summer	
<b>EYFS: Red</b>						
<b>1. Orange</b>	Online Safety ICT		Coding: On the Move ICT and Understanding Technology		Coding: Simple Inputs ICT and Understanding Technology	
<b>2. Yellow</b>	Online Safety ICT		Coding: Different Sorts of Inputs ICT and Understanding Technology		Coding: Buttons and Instructions ICT and Understanding Technology	
<b>3. Green</b>	Online Safety ICT		Coding: Sequence and Animation ICT and Understanding Technology		Coding: Conditional Events ICT and Understanding Technology	
<b>4. Blue</b>	Online Safety ICT		<b>Coding: Introduction to Variables</b> ICT and Understanding Technology		Coding: Repetition and Loops ICT and Understanding Technology	
<b>5. Indigo</b>	Online Safety ICT		Coding: Speed, Direction and Coordinates ICT and Understanding Technology		Coding: Random Numbers and Simulations ICT and Understanding Technology	
<b>6. Violet</b>	Online Safety ICT		Coding: More Complex Variables ICT and Understanding Technology		<b>Coding: Object Properties</b> ICT and Understanding Technology	

# Progression in Computing

	Understanding Technology	Coding	ICT	Online Safety
Year 1	Pupils recognise and can give examples of common uses of <b>information technology</b> they encounter in their daily routine.	Pupils create, <b>debug</b> and implement instructions (simple <b>algorithms</b> ) as <b>programs</b> on a range of digital devices.  Pupils understand that <b>digital devices</b> follow precise and unambiguous instructions. They understand that digital devices can <b>simulate</b> real situations.	With adult guidance, pupils use a range of technology to enhance and present their learning. Within both specific computing lessons and cross curricular contexts, pupils are able to: <ul style="list-style-type: none"> <li>enquire with purpose, accessing <b>digital content</b> such as text, still and moving images, video and audio</li> <li>collect <b>data</b> (e.g. numerical, research facts etc.) which they are able to retrieve, store and present as graphs, tables and charts</li> <li>present and communicate their learning to others in a variety of ways using text, still images, video and audio, including combining 2 or more of these mediums</li> </ul>	Pupils are becoming increasingly aware of <b>content, contact and conduct</b> benefits and risks, how to manage them safely and where to go for help and support when they have concerns or feel unsafe, worried or upset.  They are beginning to develop a better understanding of their own and others' <b>'identity'</b> (including online), the importance of keeping personal information private and of seeking permission before sharing. They check with an adult before clicking on <b>pop ups, notifications or dialogue boxes</b> .  They increasingly use a range of <b>digital devices</b> to communicate safely and respectfully online, making links to positive behaviour in the physical world. <i>More specific guidance for Year 1 and Year 2 teachers can be found at <a href="http://www.theictservice.org.uk/primary-computing">www.theictservice.org.uk/primary-computing</a></i>
Year 2	Pupils recognise common uses of <b>information technology</b> beyond school, including those which they don't frequently encounter in their daily routine.  Pupils understand that computers are not intelligent but can appear to be when following <b>algorithms</b> . They can share examples of this.	Pupils understand that <b>algorithms</b> are implemented as <b>programs on digital devices</b> .  Pupils create and <b>debug programs</b> to achieve specific goals and understand the importance of <b>sequence</b> .  Pupils use the <b>principles of logical reasoning</b> to plan and predict the behaviour of simple <b>programs</b> . They solve problems on and off screen		
Year 3	Pupils understand that <b>computers</b> (in various forms) generally accept <b>inputs</b> and produce <b>outputs</b> and can give examples of this.  Pupils recognise - and can describe - some of the services offered by the <b>Internet</b> , especially those used for communication and collaboration.	Pupils create <b>programs</b> to accomplish specific goals using an increasing range of <b>digital devices and applications</b> .  They can <b>decompose</b> programs to test them and understand how making even small changes to an <b>algorithm</b> can have a significant impact on the outcome.  They begin using <b>simple repetition</b> (e.g. <i>'repeat x times'</i> and <i>'repeat forever'</i> ) and understand how this can be used to improve <b>efficiency</b> in their programs.	With increasing levels of autonomy, pupils are becoming confident and creative users of technology.  Within both specific computing lessons and cross curricular contexts, pupils are able to: <ul style="list-style-type: none"> <li>follow and expand on agreed lines of enquiry, using key words and phrases to effectively access <b>digital content</b> such as text, still images, video and audio</li> <li>identify, collect and manipulate different types of <b>data</b> (e.g. numerical, research facts etc.) which they present as <b>information</b>, showing a greater awareness of purpose and audience</li> <li>present and communicate their learning to others in a variety of ways using text, still images, video and audio</li> <li>They combine <b>digital tools</b> to achieve <b>specific goals</b> and think carefully about the <b>impact on their audience</b></li> </ul>	Pupils are able to identify a range of <b>content, contact and conduct</b> benefits and risks, describe how to manage them safely and respectfully and know where to go for help and support when they have concerns.  They can explain what is meant by <b>'identity'</b> , how this might be represented differently in different situations and why others might mis-represent their identity. They develop their understanding of <b>'trust'</b> and the importance of being careful about what is shared online and of giving and gaining <b>consent</b> .  Pupils can describe <b>positive and negative effects of online activity / behaviours</b> and begin to understand how to make safer and healthier decisions, including considering the appropriateness of games and online content for different ages.  Pupils can describe positive ways for someone to interact with others online and understand how this will positively impact on how others perceive them.  <i>More specific guidance for Year 3 and Year 4 teachers can be found at <a href="http://www.theictservice.org.uk/primary-computing">www.theictservice.org.uk/primary-computing</a></i>
Year 4	Pupils develop a basic understanding of how computers can be linked to form a <b>local network</b> such as those found in schools.  Pupils recognise that there is a difference between the <b>Internet</b> and the <b>World Wide Web</b> .  They can recognise and describe some of the services offered by the <b>Internet</b> , especially those used for communication and collaboration.	Pupils create and debug <b>programs</b> containing <b>simple repetition</b> (e.g. <i>'repeat x times'</i> and <i>'repeat forever'</i> ) as well as more <b>complex repetition</b> (e.g. <i>'nested loops'</i> )  Pupils increasingly use their programming capability to control or simulate a range of different <b>outputs in physical systems</b> .  Pupils begin to explore and notice the similarities and differences between <b>programming languages</b> and use this knowledge to help them create and <b>debug programs</b> efficiently.		
Year 5	Pupils know that there is a difference between the <b>Internet</b> and the <b>World Wide Web</b> and understand that the web is just one of the services offered by the Internet (as well as, e.g. <b>email</b> and <b>VoIP services</b> such as Skype).  They appreciate how <b>search results</b> are ranked, including an understanding of the use of different <b>algorithms</b> to prioritise results. Pupils understand that the highest-ranking search results may not always be the most relevant. They appraise search results based on their <b>relevance</b> and <b>trustworthiness</b> , and can explain what is meant by <b>'fake news'</b>	Pupils create, <b>deconstruct</b> and refine <b>programs</b> to accomplish specific goals.  They create programs with <b>loops</b> which terminate when <b>conditions</b> are met or continue whilst <b>conditions</b> are present (e.g. <i>'repeat until'</i> and <i>'repeat whilst'</i> ).  Pupils understand and use simple <b>selection</b> (e.g. <i>if/then</i> and <i>if/then/else</i> ) to create <b>interactive programs</b> based on <b>conditions</b> being met / not met. They begin to use simple <b>operators</b> within their programs.	Pupils are confident, capable and creative users of technology.  Within both specific computing lessons and cross curricular contexts, pupils are able to: <ul style="list-style-type: none"> <li>create and effectively follow lines of enquiry to support their learning, and are discerning in <b>evaluating digital content</b> they encounter</li> <li>identify, collect and analyse different types of <b>data</b> (e.g. numerical, words, images, video etc.) which they manipulate and re-present as <b>information</b> for a variety of audiences and purposes</li> <li>select and make effective use of <b>digital tools</b> to create <b>digital artefacts</b> both under instruction and of their own choosing</li> <li>decide on the most appropriate way to present their learning - thinking about <b>aesthetics, functionality and impact</b> on the user, and responding appropriately.</li> </ul>	Pupils identify and manage the benefits and risks of a range of online activities in terms of <b>content, contact and conduct</b> to ensure they are <b>safe, respectful and responsible</b> online. They know how to report concerns, seek support for themselves and others and persist until they get the help they need.  Pupils make responsible choices about their own online <b>identity</b> and consider the potential impact of this on their <b>digital footprint</b> . They understand that online <b>identities</b> can be <b>copied or modified</b> and some of the possible implications of this.  They can describe times when they might responsibly share <b>personal information</b> (including payment details), the importance of seeking permission and the need for <b>strong passwords</b> .  They can describe ways technology may impact their own and others' <b>physical and mental wellbeing</b> (positively and negatively), understand their responsibilities in regard to this and can suggest a range of positive strategies to limit the negative impact of technology and online behaviours.  <i>More specific guidance for Year 5 and Year 6 teachers can be found at <a href="http://www.theictservice.org.uk/primary-computing">www.theictservice.org.uk/primary-computing</a></i>
Year 6	Pupils understand and can explain how <b>computer networks</b> work, including the <b>Internet</b> . They begin to understand how <b>data</b> travels across <b>networks in packets</b> and how these can be broken up and reconstructed.  When accessing information online, pupils recognise that <b>opinions</b> may be presented as <b>facts</b> . They can describe why an opinion may easily become popular online but they understand that this doesn't necessarily make it true.  They understand that some online content may be commercially sponsored such as <b>adverts in search results</b> or content presented by <b>social media influencers</b> .	Pupils create, <b>deconstruct</b> and refine an increasingly complex range of <b>programs</b> to accomplish specific goals.  Pupils create <b>programs</b> which store, change and report <b>variables</b> (e.g. scores in a game or time) and can include multiple <b>variables</b> in a single <b>program</b> .  Pupils can explain why they have structured <b>algorithms</b> as they have and describe the effect this has on a <b>program</b> .		