

Hawkhurst Church of England Primary School

# Skills & Knowledge Progression: Computing

A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.

National Curriculum 2013

# Embedding our Intent: Computing

At Hawkhurst CEP School, children learn computing regularly and in every year group, starting in reception, giving children the opportunity to interact with age-appropriate equipment and software. In the EYFS, children explore a wide range of different technology and explore toys and devices that make sounds, movements and images. They learn how to use simple equipment and technological toys and can use these to create simple computer programs and algorithms. In Key Stage 1, pupils build on this foundation to develop their understanding of algorithms and create and debug simple programs. They learn how to recognise common uses for technology in everyday life and how they can use technology, particularly online technologies, safely. In Key Stage 2, children learn how to create and debug increasingly complex programs and expand their experience of working with technologies to create sounds, videos and animations. They also engage with e-safety lessons to support them with using technology safely and respectfully.

Each term, classes will make links between what they are learning in computing and the school value that the whole school is focussing on. Through this, children will develop a sense of the role that our school values play in both our curriculum and the whole school community, including our special place in the community of St Laurence Church.

We are committed to ensuring all children in our school have equal opportunities to access learning and lessons are planned and taught in line with our SEN and inclusion policies.

## EYFS

The EYFS framework is structured very differently to the national curriculum as it is organised across seven areas of learning rather than subject areas. The aim of this document is to help subject leaders to understand how the skills taught across EYFS feed into national curriculum subjects.

This document demonstrates which statements from the 2020 Development Matters are prerequisite skills for computing within the national curriculum. The table below outlines the most relevant statements taken from the Early Learning Goals in the EYFS statutory framework and the Development Matters age ranges for Three and Four-Year-Olds and Reception to match the programme of study for computing.

The most relevant statements for computing are taken from the following areas of learning:

- Personal, Social and Emotional Development
- Physical Development
- Understanding the World
- Expressive Arts and Design

Computing		
Three and Four-Year-Olds	Personal, Social and Emotional Development	<ul style="list-style-type: none"><li>• Increasingly follow rules, understanding why they are important.</li></ul>
	Physical Development	<ul style="list-style-type: none"><li>• Match their developing physical skills to tasks and activities in the setting.</li></ul>
	Understanding the World	<ul style="list-style-type: none"><li>• Explore how things work.</li></ul>
Reception	Personal, Social and Emotional Development	<ul style="list-style-type: none"><li>• Show resilience and perseverance in the face of a challenge</li></ul>
	Physical Development	<ul style="list-style-type: none"><li>• Develop their small motor skills so that they can use a range of tools competently, safely and confidently.</li><li>• Know and talk about the different factors that support their overall health and wellbeing: -sensible amounts of 'screen time'.</li></ul>

	Understanding the World	<ul style="list-style-type: none"> <li>Explore, use and refine a variety of artistic effects to express their ideas and feelings.</li> </ul>
ELG	Understanding the World – Managing Self	<ul style="list-style-type: none"> <li>Be confident to try new activities and show independence, resilience and perseverance in the face of challenge.</li> <li>Explain the reasons for rules, know right from wrong and try to behave accordingly.</li> </ul>
	Physical Development – Creating with Materials	<ul style="list-style-type: none"> <li>Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function</li> </ul>

My Learning Journey: Computing Year 1		
Topic	“I CAN” These are all the skills I have learnt	“I KNOW” This is all the knowledge I have learnt
<b>Computer Science</b>	<p>Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.</p> <p>Create and debug simple programs.</p> <p>Use logical reasoning to predict the behaviour of simple programs.</p>	<p>Children understand that an algorithm is a set of instructions used to solve a problem or achieve an objective. They know that a computer program turns an algorithm into code that the computer can understand.</p> <p>Children can work out what is wrong with a simple algorithm when the steps are out of order, e.g. The Wrong Sandwich in Purple Mash and can write their own simple algorithm, e.g. Colouring in a Bird activity. Children know that an unexpected outcome is due to the code they have created and can make logical attempts to fix the code, e.g. Bubbles activity in 2Code.</p>

		When looking at a program, children can read code one line at a time and make good attempts to envision the bigger picture of the overall effect of the program. Children can, for example, interpret where the turtle in 2Go challenges will end up at the end of the program.
<b>Information Technology</b>	Use technology purposefully to create, organise, store, manipulate and retrieve digital content.	Children are able to sort, collate, edit and store simple digital content e.g. children can name, save and retrieve their work and follow simple instructions to access online resources, use Purple Mash 2Quiz example (sorting shapes), 2Code design mode (manipulating backgrounds) or using pictogram software such as 2Count.
<b>Digital Literacy</b>	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.	Children understand what is meant by technology and can identify a variety of examples both in and out of school. They can make a distinction between objects that use modern technology and those that do not e.g. a microwave vs. a chair.  Children understand the importance of keeping information, such as their usernames and passwords, private and actively demonstrate this in lessons. Children take ownership of their work and save this in their own private space such as their My Work folder on Purple Mash.

<b>My Learning Journey: Computing Year 2</b>		
<b>Topic</b>	<b>"I CAN"</b> These are all the skills I have learnt	<b>"I KNOW"</b> This is all the knowledge I have learnt

<b>Computer Science</b>	<p>Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.</p> <p>Create and debug simple programs.</p> <p>Use logical reasoning to predict the behaviour of simple programs.</p>	<p>Children can explain that an algorithm is a set of instructions to complete a task. When designing simple programs, children show an awareness of the need to be precise with their algorithms so that they can be successfully converted into code.</p> <p>Children can create a simple program that achieves a specific purpose. They can also identify and correct some errors, e.g. Debug Challenges: Chimp. Children’s program designs display a growing awareness of the need for logical, programmable steps.</p> <p>Children can identify the parts of a program that respond to specific events and initiate specific actions. For example, they can write a cause and effect sentence of what will happen in a program.</p>
<b>Information Technology</b>	<p>Use technology purposefully to create, organise, store, manipulate and retrieve digital content.</p>	<p>Children demonstrate an ability to organise data using, for example, a database such as 2Investigate and can retrieve specific data for conducting simple searches. Children are able to edit more complex digital data such as music compositions within 2Sequence. Children are confident when creating, naming, saving and retrieving content. Children use a range of media in their digital content including photos, text and sound.</p>
<b>Digital Literacy</b>	<p>Recognise common uses of information technology beyond school.</p> <p>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</p>	<p>Children can effectively retrieve relevant, purposeful digital content using a search engine. They can apply their learning of effective searching beyond the classroom. They can share this knowledge, e.g. 2Publish example template. Children make links between technology they see around them, coding and multimedia work they do in school e.g. animations,</p>

	technologies.	interactive code and programs.
--	---------------	--------------------------------

<b>My Learning Journey: Computing</b> <b>Year 3</b>		
Topic	<b>"I CAN"</b> These are all the skills I have learnt	<b>"I KNOW"</b> This is all the knowledge I have learnt
<b>Computer Science</b>	<p>Design, write and debug program that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.</p> <p>Use sequence, selection and repetition in programs; work with variables and various forms of input and output.</p> <p>Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.</p> <p>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.</p>	<p>Children can turn a simple real-life situation into an algorithm for a program by deconstructing it into manageable parts. Their design shows that they are thinking of the desired task and how this translates into code. Children can identify an error within their program that prevents it following the desired algorithm and then fix it.</p> <p>Children demonstrate the ability to design and code a program that follows a simple sequence. They experiment with timers to achieve repetition effects in their programs. Children are beginning to understand the difference in the effect of using a timer command rather than a repeat command when creating repetition effects.</p> <p>Children's designs for their programs show that they are thinking of the structure of a program in logical, achievable steps and absorbing some new knowledge of coding structures. For example, repetition and use of timers. They make good attempts to "step through" more complex code in order to identify errors in algorithms and can correct this eg in programs such as</p>

		<p>Logo, they can “read” programs with several steps and predict the outcome accurately.</p> <p>Children can list a range of ways that the internet can be used to provide different methods of communication. They can use some of these methods of communication eg being able to open, respond to and attach files to emails using 2Mail. They can describe appropriate email conventions when communicating in this way.</p>
<b>Information Technology</b>	<p>Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.</p> <p>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.</p>	<p>Children can carry out simple searches to retrieve digital content. They understand that to do this, they are connecting to the internet and using a search engine such as Purple Mash search or internet wide search engines.</p> <p>Children can collect, analyse, evaluate and present data and information using a selection of software, eg using a branching database (2Question), using software such as 2Graph. Children can consider what software is the most appropriate for a given task. They can create purposeful content to attach to emails eg 2Respond.</p>
<b>Digital Literacy</b>	<p>Use technology safely, respectfully and responsibly; recognise acceptable / unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>	<p>Children demonstrate the importance of having a secure password and not sharing this with anyone else. Furthermore, children can explain the negative implications of failure to keep passwords safe and secure. They understand the importance of staying safe and the importance of their conduct when using familiar communication tools such as 2Mail in purple Mash. They</p>



		know more than one way to report unacceptable content and contact.
--	--	--

<b>My Learning Journey: Computing</b> <b>Year 4</b>		
Topic	<b>“I CAN”</b> These are all the skills I have learnt	<b>“I KNOW”</b> This is all the knowledge I have learnt
<b>Computer Science</b>	<p>Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.</p> <p>Use sequence, selection and repetition in programs, work with variables and various forms of input and output.</p> <p>Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and pictograms.</p> <p>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.</p>	<p>When turning a real life situation into an algorithm, the children’s design shows they are thinking of the required task and how to accomplish this in code using code structures for selection and repetition. Children make more intuitive attempts to debug their own program.</p> <p>Children’s use of timers to achieve more repetition effects are becoming more logical and are integrated into their program designs. They understand IF statements for selection and attempt to combine these with other coding structures including variables to achieve the effects that they design in their programs. As well as understanding how variables can be used to store information while a program is executing, they are able to use and manipulate the value of variables. Children can make use of user inputs and outputs such as print 2 screen.</p> <p>Children’s designs for their programs show that they are thinking of a structure of a program in logical and achievable steps and absorbing some new knowledge of coding structures. For example IF statements, repetition and variables.</p>

		<p>They can trace, code and use step through methods to identify errors in code and make logical attempts to correct this.</p> <p>In programs such as Logo they can read programs with several steps and predict the outcome accurately.</p> <p>Children recognise the main components of hardware, which allow computers to join and form a network. Their ability to understand the online safety implications associated with the way the internet can be used to provide different methods of communication is improving.</p>
<b>Information Technology</b>	<p>Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.</p> <p>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.</p>	<p>Children understand the function, features and layout of a search engine. They can appraise selected web pages for credibility and information at a basic level.</p> <p>Children are able to make improvements to digital solutions based on feedback. Children make informed software choices when presenting information and data. They make linked content using a range of software such as 2connect and 2publish+.</p> <p>Children share digital content within their community ie using virtual display boards.</p>
<b>Digital Literacy</b>	<p>Use technology safely, respectfully and responsibly. Recognise acceptable / unacceptable behaviour. Identify a range of ways to report concerns on content and communication.</p>	<p>Children can explore key concepts relating to online safety using concept mapping such as 2connect. They can help others to understand the importance of online safety.</p>

		Children know a range of ways to report inappropriate content and communication.
--	--	--

<b>My Learning Journey: Computing</b> <b>Year 5</b>		
Topic	<b>“I CAN”</b> These are all the skills I have learnt	<b>“I KNOW”</b> This is all the knowledge I have learnt
<b>Computer Science</b>	<p>Design, write and debug programs that accomplish specific goals including: controlling or simulating physical systems. Solve problems by decomposing them into smaller parts.</p> <p>Use sequence, selection and repetition in programs. Work with variables and various forms of input and output.</p> <p>Use logical reasoning to explain why some simple algorithms work and to detect and correct errors in algorithms and programs.</p> <p>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.</p>	<p>Children may attempt to turn more complex real life situations into algorithms for a program by deconstructing it into manageable parts. Children are able to test and debug their programs as they go and can use logical methods to identify the approximate cause for any bug but may need some support identifying the specific line of code.</p> <p>Children can translate algorithms that include sequence, selection and repetition into code with increasing ease and their own designs show that they are thinking how to accomplish the set task in code utilising such structures. They are combining sequence, selection and repetition with other coding structures to achieve their algorithm design.</p> <p>When children code they are beginning to think about their code structure in terms of their ability to debug and interpret the code later eg the use of tabs to organise code and the naming of variables.</p>

		Children understand the value of computer networks but are also aware of the main dangers. They recognise what personal information is and can explain how this can be kept safe. Children can select the most appropriate form of online communications contingent on audience and digital content eg 2Blog, 2Email and display boards
<b>Information Technology</b>	<p>Use search technologies effectively, appreciate how resources are selected and ranked, and be discerning on evaluating digital content.</p> <p>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.</p>	<p>Children search with greater complexity for digital content when using a search engine. They are able to explain on some detail how credible a web page is and the information it contains.</p> <p>Children are able to make appropriate improvements to digital solutions based on feedback received and can confidently comment on the success of the solution eg creating their own program using a design brief using 2Code. They objectively review solutions from others. Children are able to collaboratively create content and solutions using digital features within software such as collaborative mode. They are able to use several ways of sharing digital content 2Blog, Display Boards and 2Email.</p>
<b>Digital Literacy</b>	<p>Use technology safely, respectfully and responsibly. Recognise acceptable / unacceptable behaviour. Identify a range of ways to report concerns on content and communication.</p>	Children have a common knowledge of online safety rules and can display this by demonstrating the safe and respectable use of a few different technologies and online services. Children implicitly relate appropriate online behaviour to their right to personal privacy and mental wellbeing of themselves and others.

<b>My Learning Journey: Computing Year 6</b>		
<b>Topic</b>	<b>"I CAN"</b>	<b>"I KNOW"</b>

	These are all the skills I have learnt	This is all the knowledge I have learnt
<b>Computer Science</b>	<p>Design, write and debug programs that accomplish specific goals including: controlling or simulating physical systems. Solve problems by decomposing them into smaller parts.</p> <p>Use sequence, selection and repetition in programs. Work with variables and various forms of input and output</p> <p>Use logical reasoning to explain why some simple algorithms work and to detect and correct errors in algorithms and programs.</p> <p>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.</p>	<p>Children are able to turn a more complex programming task into an algorithm by identifying the important aspects of the task (abstraction) and then decomposing them in a logical way using their knowledge of possible coding structures and applying skills from previous programs. Children test and debug their program as they go and use logical methods to identify the cause of bugs, demonstrating a systematic approach to try and identify a particular line of code causing a problem.</p> <p>Children translate algorithms that include sequence, selection and repetition into code and their own designs show that they are thinking how to accomplish the set task in code using such structures, including nesting structures within each other. Coding displays an improving understanding of variables in coding, outputs such as sound and movement, inputs from the user of the program such as button clicks and the value of functions.</p> <p>Children are able to interpret a program in parts and can make logical attempts to put the separate parts of a complex algorithm together to explain the program as a whole.</p> <p>Children understand and can explain in some depth the difference between the internet and the world wide web. Children know what a WAN and a LAN are can describe how they access the internet in school.</p>

<b>Information Technology</b>	<p>Use search technologies effectively, appreciate how resources are selected and ranked, and be discerning on evaluating digital content.</p> <p>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.</p>	<p>Children readily apply filters when searching for digital content. They are able to explain in detail how credible a web page is and the information it contains. They compare a range of digital content sources and are able to rate them in terms of content quality and accuracy. Children use critical thinking skills in everyday use of online communication.</p> <p>Children make clear connections to the audience when designing and creating digital content. The children design and create their own blogs to become a content creator on the internet eg 2Blog. They are able to use criteria to evaluate the quality of digital solutions and are able to identify improvements, making some refinements.</p>
<b>Digital Literacy</b>	<p>Use technology safely, respectfully and responsibly. Recognise acceptable / unacceptable behaviour. Identify a range of ways to report concerns on content and communication.</p>	<p>Children demonstrate the safe and respectful use of a range of different technologies and online services. They identify more discreet inappropriate behaviours, through developing critical thinking eg 2Respond activities. They recognise the value in preserving their privacy when online, for their own and other people's safety.</p>