

# Computing Skills Overview



*Holding God's Hand, we nurture hearts, minds and spirits.*

	Year 1
Hardware	<ul style="list-style-type: none"> <li>Learning how to operate a camera or tablet to take photos and videos.</li> <li>Learning how to explore and tinker with hardware to find out how it works.</li> <li>Recognising that some devices are input devices and others are output devices.</li> <li>Learning where keys are located on the keyboard.</li> </ul>
Networks and Data Representations	NA
Computational Thinking	<ul style="list-style-type: none"> <li>Learning that decomposition means breaking a problem down into smaller parts.</li> <li>Using decomposition to solve unplugged challenges.</li> <li>Using logical reasoning to predict the behaviour of simple programs.</li> <li>Developing the skills associated with sequencing in unplugged activities.</li> <li>Following a basic set of instructions.</li> <li>Assembling instructions into a simple algorithm.</li> </ul>
Programming	<ul style="list-style-type: none"> <li>Programming a Floor robot to follow a planned route.</li> <li>Learning to debug instructions when things go wrong.</li> <li>Using programming language to explain how a floor robot works.</li> <li>Learning to debug an algorithm in an unplugged scenario.</li> </ul>
Using Software	<ul style="list-style-type: none"> <li>Using a basic range of tools within graphic editing software.</li> <li>Taking and editing photographs.</li> <li>Developing control of the mouse through dragging, clicking and resizing of images to create different effects.</li> <li>Developing understanding of different software tools.</li> </ul>
Using email and internet searches	<ul style="list-style-type: none"> <li>Recognising devices that are connected to the internet.</li> <li>Searching and downloading images from the internet safely.</li> <li>Understanding that we are connected to others when using the internet.</li> </ul>
Using data	<ul style="list-style-type: none"> <li>Understanding that technology can be used to represent data in different ways: pictograms, tables, pie charts, bar charts, block graphs etc.</li> <li>Using representations to answer questions about data.</li> <li>Using software to explore and create pictograms and branching databases.</li> </ul>

<b>Wider Use of Technology</b>	<ul style="list-style-type: none"> <li>• Recognising common uses of information technology, including beyond school.</li> <li>• Understanding some of the ways we can use the internet.</li> </ul>
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	Year 2
<b>Hardware</b>	<ul style="list-style-type: none"> <li>• Understanding what a computer is and that it's made up of different components.</li> <li>• Recognising that buttons cause effects and that technology follows instructions.</li> <li>• Learning how we know that technology is doing what we want it to do via its output.</li> <li>• Using greater control when taking photos with cameras, tablets or computers.</li> <li>• Developing confidence with the keyboard and the basics of touch typing.</li> </ul>
<b>Networks and Data Representations</b>	NA
<b>Computational Thinking</b>	<ul style="list-style-type: none"> <li>• Articulating what decomposition is.</li> <li>• Decomposing a game to predict the algorithms used to create it.</li> <li>• Learning that there are different levels of abstraction.</li> <li>• Explaining what an algorithm is.</li> <li>• Following an algorithm.</li> <li>• Creating a clear and precise algorithm.</li> <li>• Learning that programs execute by following precise instructions.</li> <li>• Incorporating loops within algorithms.</li> </ul>
<b>Programming</b>	<ul style="list-style-type: none"> <li>• Using logical thinking to explore software, predicting, testing and explaining what it does.</li> <li>• Using an algorithm to write a basic computer program.</li> <li>• Using loop blocks when programming to repeat an instruction more than once.</li> </ul>
<b>Using Software</b>	<ul style="list-style-type: none"> <li>• Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts.</li> <li>• Using word processing software to type and reformat text.</li> <li>• Using software (and unplugged means) to create story animations.</li> <li>• Creating and labelling images.</li> </ul>
<b>Using email and internet searches</b>	<ul style="list-style-type: none"> <li>• Searching for appropriate images to use in a document.</li> <li>• Understanding what online information is.</li> </ul>
<b>Using data</b>	<ul style="list-style-type: none"> <li>• Collecting and inputting data into a spreadsheet.</li> <li>• Interpreting data from a spreadsheet.</li> </ul>
<b>Wider Use of Technology</b>	<ul style="list-style-type: none"> <li>• Learning about the Internet of Things and how it has led to 'big data'.</li> <li>• Learning how 'big data' can be used to solve a problem or improve efficiency.</li> </ul>

	<b>Year 3</b>
<b>Hardware</b>	<ul style="list-style-type: none"> <li>• Understanding what the different components of a computer do and how they work together.</li> <li>• Drawing comparisons across different types of computers.</li> <li>• Learning about the purpose of routers.</li> </ul>
<b>Networks and Data Representations</b>	<ul style="list-style-type: none"> <li>• Understanding the role of the key components of a network.</li> <li>• Identifying the key components within a network, including whether they are wired or wireless.</li> <li>• Understanding that websites and videos are files that are shared from one computer to another.</li> <li>• Learning about the role of packets.</li> <li>• Understanding how networks work and their purpose.</li> <li>• Recognising links between networks and the internet.</li> <li>• Learning how data is transferred.</li> </ul>
<b>Computational Thinking</b>	<ul style="list-style-type: none"> <li>• Using decomposition to explain the parts of a laptop computer.</li> <li>• Using decomposition to explore the code behind an animation.</li> <li>• Using repetition in programs.</li> <li>• Using logical reasoning to explain how simple algorithms work.</li> <li>• Explaining the purpose of an algorithm.</li> <li>• Forming algorithms independently.</li> </ul>
<b>Programming</b>	<ul style="list-style-type: none"> <li>• Using logical thinking to explore more complex software; predicting, testing and explaining what it does.</li> <li>• Incorporating loops to make code more efficient.</li> <li>• Continuing existing code.</li> <li>• Making reasonable suggestions for how to debug their own and others' code.</li> </ul>
<b>Using Software</b>	<ul style="list-style-type: none"> <li>• Taking photographs and recording video to tell a story.</li> <li>• Using software to edit and enhance their video adding music, sounds and text on screen with transitions.</li> </ul>
<b>Using email and internet searches</b>	<ul style="list-style-type: none"> <li>• Learning to log in and out of an email account.</li> <li>• Writing an email including a subject, 'to' and 'from.'</li> <li>• Sending an email with an attachment.</li> <li>• Replying to an email.</li> </ul>
<b>Using data</b>	<ul style="list-style-type: none"> <li>• Understanding the vocabulary to do with databases: field, record, data.</li> <li>• Learning about the pros and cons of digital versus paper databases.</li> <li>• Sorting and filtering databases to easily retrieve information.</li> <li>• Creating and interpreting charts and graphs to understand data.</li> </ul>
<b>Wider Use of Technology</b>	<ul style="list-style-type: none"> <li>• Understanding the purpose of emails.</li> <li>• Recognising how social media platforms are used to interact.</li> </ul>

	<b>Year 4</b>
<b>Hardware</b>	<ul style="list-style-type: none"> <li>• Using tablets or digital cameras to film a weather forecast.</li> <li>• Understanding that weather stations use sensors to gather and record data which predicts the weather.</li> </ul>
<b>Networks and Data Representations</b>	<ul style="list-style-type: none"> <li>• Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration.</li> </ul>
<b>Computational Thinking</b>	<ul style="list-style-type: none"> <li>• Using decomposition to solve a problem by finding out what code was used.</li> <li>• Using decomposition to understand the purpose of a script of code.</li> <li>• Identifying patterns through unplugged activities.</li> <li>• Using past experiences to help solve new problems.</li> <li>• Using abstraction to identify the important parts when completing both plugged and unplugged activities.</li> </ul>
<b>Programming</b>	<ul style="list-style-type: none"> <li>• Creating algorithms for a specific purpose.</li> <li>• Coding a simple game.</li> <li>• Using abstraction and pattern recognition to modify code.</li> <li>• Incorporating variables to make code more efficient.</li> </ul>
<b>Using Software</b>	<ul style="list-style-type: none"> <li>• Building a web page and creating content for it.</li> <li>• Designing and creating a webpage for a given purpose.</li> <li>• Use online software for documents, presentations, forms and spreadsheets.</li> <li>• Using software to work collaboratively with others.</li> </ul>
<b>Using email and internet searches</b>	<ul style="list-style-type: none"> <li>• Understanding why some results come before others when searching.</li> <li>• Using keywords to effectively search for information on the internet.</li> <li>• Understanding that information found by searching the internet is not all grounded in fact.</li> <li>• Searching the internet for data.</li> </ul>
<b>Using data</b>	<ul style="list-style-type: none"> <li>• Understanding why some results come before others when searching.</li> <li>• Using keywords to effectively search for information on the internet.</li> <li>• Understanding that information found by searching the internet is not all grounded in fact.</li> <li>• Searching the internet for data.</li> </ul>
<b>Wider Use of Technology</b>	<ul style="list-style-type: none"> <li>• Understanding that software can be used collaboratively online to work as a team.</li> </ul>

	<b>Year 5</b>
<b>Hardware</b>	<ul style="list-style-type: none"> <li>• Learning that external devices can be programmed by a separate computer.</li> <li>• Learning the difference between ROM and RAM.</li> <li>• Recognising how the size of RAM affects the processing of data.</li> <li>• Understanding the fetch, decode, execute cycle.</li> </ul>
<b>Networks and Data Representations</b>	<ul style="list-style-type: none"> <li>• Learning the vocabulary associated with data: data and transmit.</li> <li>• Learning how the data for digital images can be compressed.</li> <li>• Recognising that computers transfer data in binary and understanding simple binary addition.</li> <li>• Relating binary signals (Boolean) to the simple character-based language, ASCII.</li> <li>• Learning that messages can be sent by binary code, reading binary up to eight characters and carrying out binary calculations.</li> <li>• Understanding how bit patterns represent images as pixels.</li> </ul>
<b>Computational Thinking</b>	<ul style="list-style-type: none"> <li>• Decomposing animations into a series of images.</li> <li>• Decomposing a program without support.</li> <li>• Decomposing a story to be able to plan a program to tell a story.</li> <li>• Predicting how software will work based on previous experience.</li> <li>• Writing more complex algorithms for a purpose.</li> </ul>
<b>Programming</b>	<ul style="list-style-type: none"> <li>• Programming an animation.</li> <li>• Iterating and developing their programming as they work.</li> <li>• Confidently using loops in their programming.</li> <li>• Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected.</li> <li>• Writing code to create a desired effect.</li> <li>• Using a range of programming commands.</li> <li>• Using repetition within a program.</li> <li>• Amending code within a live scenario.</li> </ul>
<b>Using Software</b>	<ul style="list-style-type: none"> <li>• Using logical thinking to explore software more independently, making predictions based on their previous experience.</li> <li>• Using software programme Sonic Pi/Scratch to create music.</li> <li>• Using the video editing software to animate.</li> <li>• Identify ways to improve and edit programs, videos, images etc.</li> <li>• Independently learning how to use 3D design software package TinkerCAD.</li> </ul>
<b>Using email and internet searches</b>	<ul style="list-style-type: none"> <li>• Developing searching skills to help find relevant information on the internet.</li> <li>• Learning how to use search engines effectively to find information, focussing on keyword searches and evaluating search returns.</li> </ul>
<b>Using data</b>	<ul style="list-style-type: none"> <li>• Understanding how data is collected in remote or dangerous places.</li> <li>• Understanding how data might be used to tell us about a location.</li> </ul>
<b>Wider Use of Technology</b>	<ul style="list-style-type: none"> <li>• Learn about different forms of communication that have developed with the use of technology.</li> </ul>

	<b>Year 6</b>
<b>Hardware</b>	<ul style="list-style-type: none"> <li>• Learning about the history of computers and how they have evolved over time.</li> <li>• Using the understanding of historic computers to design a computer of the future.</li> <li>• Understanding and identifying barcodes, QR codes and RFID.</li> <li>• Identifying devices and applications that can scan or read barcodes, QR codes and RFID.</li> <li>• Understanding how corruption can happen within data during transfer (for example when downloading, installing, copying and updating files).</li> </ul>
<b>Networks and Data Representations</b>	<ul style="list-style-type: none"> <li>• Understanding that computer networks provide multiple services.</li> </ul>
<b>Computational Thinking</b>	<ul style="list-style-type: none"> <li>• Decomposing a program into an algorithm.</li> <li>• Using past experiences to help solve new problems.</li> <li>• Writing increasingly complex algorithms for a purpose.</li> </ul>
<b>Programming</b>	<ul style="list-style-type: none"> <li>• Debugging quickly and effectively to make a program more efficient.</li> <li>• Remixing existing code to explore a problem.</li> <li>• Using and adapting nested loops.</li> <li>• Programming using the language Python.</li> <li>• Changing a program to personalise it.</li> <li>• Evaluating code to understand its purpose.</li> <li>• Predicting code and adapting it to a chosen purpose.</li> <li>•</li> </ul>
<b>Using Software</b>	<ul style="list-style-type: none"> <li>• Using logical thinking to explore software independently, iterating ideas and testing continuously.</li> <li>• Using search and word processing skills to create a presentation.</li> <li>• Creating and editing sound recordings for a specific purpose.</li> <li>• Creating and editing videos, adding multiple elements: music, voiceover, sound, text and transitions.</li> <li>• Using design software TinkerCAD to design a product.</li> <li>• Creating a website with embedded links and multiple pages.</li> </ul>
<b>Using email and internet searches</b>	<ul style="list-style-type: none"> <li>• Understanding how search engines work.</li> </ul>
<b>Using data</b>	<ul style="list-style-type: none"> <li>• Understanding how barcodes, QR codes and RFID work.</li> <li>• Gathering and analysing data in real time.</li> <li>• Creating formulas and sorting data within spreadsheets.</li> </ul>
<b>Wider Use of Technology</b>	<ul style="list-style-type: none"> <li>• Learning about the Internet of Things and how it has led to 'big data'.</li> <li>• Learning how 'big data' can be used to solve a problem or improve efficiency.</li> </ul>