



# Computing Skills Progression

Skill	Year 3	Year 4	Year 5	Year 6
<p><b>Hardware</b></p>	<p>Understanding what the different components of a computer do and how they work together.</p> <p>Drawing comparisons across different types of computers.</p> <p>Learning about the purpose of routers.</p>	<p>Using tablets or digital cameras to film a weather forecast.</p> <p>Understanding that weather stations use sensors to gather and record data which predicts the weather.</p>	<p>Learning that external devices can be programmed by a separate computer.</p> <p>Learning the difference between ROM and RAM.</p> <p>Recognising how the size of RAM affects the processing of data.</p> <p>Understanding the fetch, decode, execute cycle.</p>	<p>Learning about the history of computers and how they have evolved over time.</p> <p>Using the understanding of historic computers to design a computer of the future.</p> <p>Understanding and identifying barcodes, QR codes and RFID.</p> <p>Identifying devices and applications that can scan or read barcodes, QR codes and RFID.</p> <p>Understanding how corruption can happen within data during transfer (for example when downloading, installing, copying and updating files).</p> <p>Identify different types of AI and their applications in everyday life.</p>
<p><b>Networks and data representation</b></p>	<p>Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration.</p> <p>Understanding the role of the key components of a network.</p> <p>Identifying the key components within a network, including whether they are wired or wireless.</p> <p>Understanding that websites and videos are files that are shared from one computer to another.</p> <p>Learning about the role of packets.</p> <p>Understanding how networks work and their purpose.</p> <p>Recognising links between networks and the internet.</p> <p>Learning how data is transferred.</p>	<p>Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration.</p>	<p>Learning the vocabulary associated with data: data and transmit.</p> <p>Learning how the data for digital images can be compressed.</p> <p>Recognising that computers transfer data in binary and understanding simple binary addition.</p> <p>Relating binary signals (Boolean) to the simple character-based language, ASCII.</p> <p>Learning that messages can be sent by binary code, reading binary up to eight characters and carrying out binary calculations.</p> <p>Understanding how bit patterns represent images as pixels.</p>	<p>Understanding that computer networks provide multiple services.</p>

## Computational Thinking

Using decomposition to explain the parts of a laptop computer.

Using decomposition to explore the code behind an animation.

Using repetition in programs.

Using logical reasoning to explain how simple algorithms work.

Explaining the purpose of an algorithm.

Forming algorithms independently.

Working towards a given goal that a program needs to accomplish.

Breaking down what they want to achieve into smaller, manageable parts.

Tinkering with an existing text-based code to see how it affects a program.

Remixing code to alter and add to an existing program.

Recognising the relationship between what is happening in a program and the written (block) code.

Working backwards, beginning to identify the code they think a program uses.

Running small chunks of code at a time to find the error or bug.

Using decomposition to solve a problem by finding out what code was used. Using decomposition to understand the purpose of a script of code. Identifying patterns through unplugged activities. Using past experiences to help solve new problems. Using abstraction to identify the important parts when completing both plugged and unplugged activities. Working towards a given goal that a program needs to accomplish. Breaking down what they want to achieve into smaller, manageable parts. Tinkering with an existing text-based code to see how it affects a program. Using logic, pattern recognition and decomposition to solve simple problems. Remixing code to alter and add to an existing program. Recognising repeating patterns in a program or code. Creating loops to make code more efficient in block-based programs. Beginning to use variables in block-based programming languages to make programs more interactive. Including a conditional statement in block-based programming languages. Recognising the relationship between what is happening in a program and the written (block) code

Decomposing animations into a series of images. Decomposing a program without support. Decomposing a story to be able to plan a program to tell a story. Predicting how software will work based on previous experience. Writing more complex algorithms for a purpose.

Decomposing a program into an algorithm. Using past experiences to help solve new problems. Writing increasingly complex algorithms for a purpose. Analysing the effectiveness of prompts and refine them for improved AI outputs.

<p style="text-align: center;"><b>Programming</b></p>	<p>Using logical thinking to explore more complex software; predicting, testing and explaining what it does.</p> <p>Incorporating loops to make code more efficient.</p> <p>Continuing existing code.</p> <p>Making reasonable suggestions for how to debug their own and others' code.</p>	<p>Creating algorithms for a specific purpose.</p> <p>Coding a simple game.</p> <p>Using abstraction and pattern recognition to modify code.</p> <p>Incorporating variables to make code more efficient.</p>	<p>Programming an animation.</p> <p>Iterating and developing their programming as they work.</p> <p>Confidently using loops in their programming.</p> <p>Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected.</p> <p>Writing code to create a desired effect.</p> <p>Using a range of programming commands.</p> <p>Using repetition within a program.</p> <p>Amending code within a live scenario.</p> <p>Making links between different programming interfaces they are faced with.</p> <p>Planning a program to be downloaded to a physical system/device to solve a particular problem.</p> <p>Programming a physical system that has the capability for sensory input (e.g. a micro:bit)</p>	<p>Debugging quickly and effectively to make a program more efficient.</p> <p>Remixing existing code to explore a problem.</p> <p>Using and adapting nested loops.</p> <p>Programming using the language Python.</p> <p>Changing a program to personalise it.</p> <p>Evaluating code to understand its purpose.</p> <p>Predicting code and adapting it to a chosen purpose.</p> <p>Applying coding skills like decomposition and pattern recognition to interact with AI applications.</p>
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<p><b>Using software</b></p>	<p>Taking photographs and recording video</p> <p>Using software to edit and enhance their video adding music, sounds and text on screen with transitions.to tell a story.</p>	<p>Building a web page and creating content for it.</p> <p>Designing and creating a webpage for a given purpose.</p> <p>Use online software for documents, presentations, forms and spreadsheets.</p> <p>Using software to work collaboratively with others.</p> <p>Translating HTML into text and images. Identifying HTML tags.</p> <p>Altering HTML on a live web page.</p> <p>Replacing images on a web page.</p>	<p>Using logical thinking to explore software more independently, making predictions based on their previous experience.</p>	<p>Using logical thinking to explore software independently, iterating ideas and testing continuously.</p>
<p><b>Using email and internet searches</b></p>	<p>Learning to log in and out of an email account.</p> <p>Writing an email including a subject, 'to' and 'from.'</p> <p>Sending an email with an attachment.</p> <p>Replying to an email.</p>	<p>Understanding why some results come before others when searching.</p> <p>Using keywords to effectively search for information on the internet.</p> <p>Understanding that information found by searching the internet is not all grounded in fact.</p> <p>Searching the internet for data</p>	<p>Developing searching skills to help find relevant information on the internet.</p> <p>Learning how to use search engines effectively to find information, focussing on keyword searches and evaluating search returns.</p>	<p>Understanding how search engines work.</p>

<p><b>Using data</b></p>	<p>Understanding the vocabulary to do with databases: field, record, data.</p> <p>Learning about the pros and cons of digital versus paper databases.</p> <p>Sorting and filtering databases to easily retrieve information.</p> <p>Creating and interpreting charts and graphs to understand data.</p>	<p>Understanding that data is used to forecast weather.</p> <p>Recording data in a spreadsheet independently.</p> <p>Sorting data in a spreadsheet to compare using the 'sort by...' option.</p> <p>Designing a device which gathers and records sensor data.</p>	<p>Understanding how data is collected in remote or dangerous places.</p> <p>Understanding how data might be used to tell us about a location.</p>	<p>Understanding how barcodes, QR codes and RFID work.</p> <p>Gathering and analysing data in real time.</p> <p>Creating formulas and sorting data within spreadsheets.</p>
<p><b>Wider use of technology</b></p>	<p>Understanding the purpose of emails.</p> <p>Recognising how social media platforms are used to interact.</p>	<p>Understanding that software can be used collaboratively online to work as a team.</p> <p>Exploring the HTML on a web page.</p>	<p>Learn about different forms of communication that have developed with the use of technology.</p>	<p>Learning about the Internet of Things and how it has led to 'big data'.</p> <p>Learning how 'big data' can be used to solve a problem or improve efficiency.</p>

<p><b>Digital Literacy</b></p>	<p>Recognising that different information is shared online including facts, beliefs and opinions.</p> <p>Learning how to identify reliable information when searching online.</p> <p>Learning how to stay safe on social media.</p> <p>Considering the impact technology can have on mood.</p> <p>Learning about cyberbullying.</p> <p>Learning that not all emails are genuine, recognising when an email might be fake and what to do about it.</p>	<p>Recognising that information on the internet might not be true or correct and that some sources are more trustworthy than others.</p> <p>Learning to make judgements about the accuracy of online searches.</p> <p>Identifying forms of advertising online.</p> <p>Recognising what appropriate behaviour is when collaborating with others online.</p> <p>Reflecting on the positives and negatives of time spent online.</p> <p>Identifying respectful and disrespectful online behaviour.</p>	<p>Identifying possible dangers online and learning how to stay safe.</p> <p>Evaluating the pros and cons of online communication.</p> <p>Recognising that information on the internet might not be true or correct and learning ways of checking validity.</p> <p>Learning what to do if they experience bullying online.</p> <p>Learning to use an online community safely</p>	<p>Learning about the positive and negative impacts of sharing online.</p> <p>Learning strategies to create a positive online reputation.</p> <p>Understanding the importance of secure passwords and how to create them.</p> <p>Learning strategies to capture evidence of online bullying in order to seek help.</p> <p>Using search engines safely and effectively.</p> <p>Recognising that updated software can help to prevent data corruption and hacking.</p> <p>Exploring ethical considerations around AI use and its impact on society.</p>
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