

**Computing at West Ashton – knowledge and skills progression document**

		Y1/2	Y3/4	Y5/6
Computer Science	Hardware	<p>Learning how to explore the tinker with hardware to find out how it works.</p> <p>Understanding that computers and devices around us use inputs and outputs, identifying some of these.</p> <p>Learning where keys are located on the keyboard.</p> <p>Learning how to operate camera.</p> <p>Understanding what a computer is and that it is made up of different components.</p> <p>Recognising that buttons cause effects and that technology follows instructions.</p> <p>Learning how we know that technology is doing what we wanted to do via its output.</p> <p>Using greater control when taking photos with tablets or computers.</p> <p>Developing confidence with the keyboard and the basics of touch typing.</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 what a server does.</p> <p>Learning about the purpose of routers.</p>	<p>Learning the 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've evolved over time.</p> <p>Using the understanding of historic computers to design a computer for the future.</p> <p>Understanding and identifying bar codes, QR codes and RFID.</p> <p>Identifying devices and applications that can scan or read bar codes, QR codes and RFID.</p> <p>Acknowledging that corruption can happen within data during transfer (for example when downloading or installing or copying or updating files)</p>
	Networks and data representation		<p>Learning what a network is and its purpose.</p> <p>Identifying the key components within a network, including whether they are wired or wireless.</p> <p>Recognising links between networks on the Internet.</p> <p>Learning how data is transferred.</p> <p>Consolidating understanding of the key components of a network.</p> <p>Understanding that websites and videos or files that are shared from one computer to another.</p> <p>Learning about the roles of packets.</p>	<p>Learning the capacity 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 to the simple character-based language, ASCII.</p> <p>Learning that messages can be sent by binary code, reading binary up to 8 characters and carrying out binary calculations.</p> <p>Understanding how bit patterns represent images in pixels.</p>

			Understanding that computer networks provide multiple services, such as the worldwide web, and opportunities for communication and collaboration.	Understanding that computer networks provide multiple services.
	<b>Computational thinking</b>	<p>Learning that decomposition means breaking a problem down into smaller parts.</p> <p>Using decomposition to solve unplugged challenges.</p> <p>Using logical reasoning to predict the behaviour of simple programs.</p> <p>Developing the skills associated with sequencing in unplugged activities.</p> <p>Learning that an algorithm is a set of step by step instructions used to carry out a task, in a specific order.</p> <p>Follow a basic set of instructions.</p> <p>Assembling instructions into a simple algorithm.</p> <p>Decomposing a game to predict the algorithms to create it.</p> <p>Using decomposition to decompose a story into smaller parts.</p> <p>Learning what abstraction is.</p> <p>Learning that there are different levels of abstraction.</p> <p>Explaining what an algorithm is.</p> <p>Following an algorithm.</p> <p>Creating a clear and precise algorithm.</p> <p>Learning that computers use algorithms to make predictions.</p> <p>Learning that programs execute by following precise instructions.</p> <p>Incorporating loops within algorithms.</p>	<p>Using decomposition to explain the parts of a laptop computer.</p> <p>Using decomposition to explore the code behind an animation.</p> <p>Using repetition in programs.</p> <p>Understanding that computers follow instructions.</p> <p>Using an algorithm to explain the roles of different parts of a computer.</p> <p>Using logical reasoning to explain how simple algorithms work.</p> <p>Explaining the purpose of an algorithm.</p> <p>Forming algorithms independently.</p> <p>Solving unplugged problems by decomposing them into smaller parts.</p> <p>Using decomposition to understand the purpose of a script of code.</p> <p>Using decomposition to help solve problems.</p> <p>Identifying patterns through unplugged activities.</p> <p>Using past experiences to help solve new problems.</p> <p>Using abstraction to identify the important parts when completing both plugged and unplugged activities.</p> <p>Creating algorithms for a specific purpose.</p>	<p>Decomposing animations into a series of images.</p> <p>Decomposing a program without support.</p> <p>Decomposing a story to be able to plan a program to tell a story.</p> <p>Predicting how software will work based on previous experience.</p> <p>Writing more complex algorithms for a purpose.</p> <p>Decomposing a program into an algorithm.</p> <p>Using past experiences to help solve new problems.</p> <p>Writing increasingly complex algorithms for a purpose.</p>
	<b>Programming</b>	<p>Programming a bee bot to follow a planned route.</p> <p>Learning to debug instructions when things go wrong.</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>Programming an animation.</p> <p>Iterating and developing programming as they work.</p> <p>Beginning to use nested loops (loops within loops)</p>

		<p>Developing a how-to video to explain how the bee bot works.</p> <p>Learning to debug an algorithm in an unplugged scenario.</p> <p>Using logical thinking to explore software, predicting, testing and explaining what it does.</p> <p>Using an algorithm to write a basic computer program.</p> <p>Learning what loops are.</p> <p>Incorporating loops to make code more efficient.</p>	<p>Remixing existing code.</p> <p>Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected.</p> <p>Understanding that websites can be altered by exploring the code beneath the site.</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>Remixing existing code.</p> <p>Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected.</p>	<p>Debugging their own code.</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>Debugging quickly and effectively to make a program more efficient.</p> <p>Remixing existing code to explore a problem.</p> <p>Using 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>Altering a websites code to create changes.</p>
Information technology	Using software	<p>Using a basic range of tools within graphic editing software.</p> <p>Taking and editing photographs.</p> <p>Understanding how to create digital art using an online paint tool.</p> <p>Developing control of the mouse through dragging, clicking and resizing of images to create different effects.</p> <p>Developing understanding of different software tools.</p> <p>Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts.</p> <p>Using word processing software to type and reformat text.</p> <p>Using software to create story animations.</p> <p>Creating and labelling images.</p>	<p>Taking photographs and recording video to tell a story.</p> <p>Using software to edit and enhance video adding music comment sounds and text on screen with transitions.</p> <p>Building a web page and creating content for it.</p> <p>Designing and creating a webpage for given purpose.</p> <p>Using software for documents, presentations come up forms and spreadsheets.</p> <p>Work collaboratively with others.</p>	<p>Using logical thinking to explore software more independently, making predictions based on previous experience.</p> <p>Using software program Sonic Pi to create music.</p> <p>Using the video editing software: to animate. Identify ways to improve and edit programs, videos, images etc.</p> <p>Independently learning how to use 3D design software package TinkerCAD.</p> <p>Using logical thinking to explore software independently, iterating ideas and testing continuously.</p> <p>Using search and word processing skills to create presentation.</p> <p>Planning, recording and editing a radio play.</p> <p>Creating and editing sound recordings for specific purpose.</p> <p>Creating and editing videos, adding multiple elements: music, voice over, sound comment text and transitions to create a video advert.</p>

				Using design software TinkerCAD to design a product. Creating a website with embedded links and multiple pages.
	<b>Using email and the internet</b>	Searching and downloading images from the Internet safely.	Learning to log in and out of an email account. Writing an email including a subject, to and from. Sending an email with an attachment. Replying to an email.	Developing searching skills to help find relevant information on the Internet. Learning how to use search engines affectively to find information, focusing on keyword searches and evaluating search returns. Understanding how search engines work.
	<b>Using data</b>	Introduction to spreadsheets. Representing data in tables comment charts and pictograms. Sorting data and creating branching databases. Identifying where digital content can have advantages over paper when storing and manipulating data. Collecting and inputting data into a spreadsheet. Interpreting data.	Understanding the vocabulary associated with databases: field, record, data. Learning about the pros and cons of digital versus paper databases. Sorting and filtering databases to easily retrieve information. Creating and interpreting charts and graphs to understand data. Designing a weather station which gathers and records sensor data.	Understanding how data is collected. Understanding how bar codes, QR codes and RFID work. Gathering and analysing data in real time. Creating formulas and sorting data within spreadsheets.
	<b>Wider use of technology</b>	Recognising common uses of information technology, including beyond school. Recognising uses of technology beyond the school. learning how computers are used in the wider world.	Understanding the purpose of emails. Understanding that software can be used collaboratively online to work as a team.	Learning what the search engine is. Learning about the Internet of Things and how it is led to 'big data'. Learning how 'big data' can be used to solve a problem or improve efficiency.

<p><b>Digital literacy</b></p>	<p>Logging in and out and saving work on their own account.</p> <p>Understand the importance of a password.</p> <p>When using the Internet to search for images, learning what to do if they come across something online that worries them or makes them feel uncomfortable.</p> <p>Understanding how to stay safe when talking to people online. Not sharing personal information and what to do if they see or hear something online that makes them feel upset or uncomfortable.</p>	<p>learning to be a responsible digital citizen; understanding their responsibilities to treat others respectfully and recognising when digital behaviour is unkind.</p> <p>Learning about cyber bullying.</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 what appropriate behaviour is when collaborating with others online.</p> <p>Recognising the information on the Internet might not be true or correct and that some sources are more trustworthy than others</p>	<p>Identifying possible dangers online and learning how to stay safe.</p> <p>Creating an animation about digital safety.</p> <p>Recognising the information on the Internet might not be true or correct and learning ways of checking validity.</p> <p>Learning to use an online community safely. understand the importance of secure passwords and how to create them full stop new line using search engines safely and effectively full stop new line recognising the updated software can help prevent data</p>
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