



Mytchett Primary Academy - Computing Skills Progression



Computer Science - Hardware

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Understand that if you push a button on device it will respond e.g. remote control toy.</p> <p>Recognise basic parts of a computer e.g. mouse, screen, keyboard.</p> <p>Recognise basic parts of a keyboard e.g. spacebar, numbers and letters.</p> <p>Use a mouse to move the pointer on a screen.</p>	<p>Explore and tinker with hardware to find out how it works.</p> <p>Understand that computers and devices around us use inputs and outputs, identifying some of these.</p> <p>Show where keys are located on the keyboard.</p> <p>Operate a camera.</p>	<p>Understand what a computer is and that it's made up of different components.</p> <p>Recognise that buttons cause effects and that technology follows instructions.</p> <p>Know how technology is doing what we want it to do via its output.</p> <p>Use greater control when taking photos with tablets or computers.</p> <p>Develop confidence with the keyboard and the basics of touch typing.</p>	<p>Understand what the different components of a computer do and how they work together.</p> <p>Draw comparisons across different types of computers.</p> <p>Explain what a server does.</p>	<p>Explain the purpose of routers.</p>	<p>Know that external devices can be programmed by a separate computer.</p> <p>Know the difference between ROM and RAM.</p> <p>Explain how the size of RAM affects the processing of data.</p> <p>Understand the fetch, decode and execute cycle.</p>	<p>Know about the history of computers and how they have evolved over time.</p> <p>Use the understanding of historic computers to design a computer of the future.</p> <p>Know how barcodes, QR codes and RFID work.</p> <p>Understand about some of the methods which cause data corruption.</p>
Vocabulary: Computer Mouse Keyboard Spacebar Keys Screen	Vocabulary: Hardware Input Output Mouse Touchscreen Keyboard Camera Focus	Vocabulary: Digital Device Component Processor Monitor/screen Mouse Keyboard	Vocabulary: CPU Motherboard Memory Desktop Laptop Tablet Smartphone Hard drive	Vocabulary: Network Router	Vocabulary: ROM RAM Memory Cache	Vocabulary: QR Code RFID



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Computer Science - Networks and Data Representation						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
			<p>Explain what a network is and its purpose.</p> <p>Identify the key components within a network, including whether they are wired or wireless.</p> <p>Recognise links between networks and the internet.</p> <p>Explain how data is transferred.</p>	<p>Consolidate the understanding of the key components of a network.</p> <p>Understand that websites & videos are files that are shared from one computer to another.</p> <p>Know about the role of packets.</p> <p>Explain that computer networks provide multiple services, such as the World Wide Web and opportunities for communication and collaboration.</p>	<p>Use the vocabulary associated with data: data and transmit.</p> <p>Demonstrate how the data for digital images can be compressed.</p> <p>Recognise that computers transfer data in binary and understanding simple binary addition.</p> <p>Relate binary signals (Boolean) to the simple character-based language, ASCII.</p> <p>Understand that messages can be sent by binary code, reading binary up to 8 characters and carrying out binary calculations.</p> <p>Articulate how bit patterns represent images as pixels.</p>	<p>Understand that computer networks provide multiple services.</p>
Vocabulary:	Vocabulary:	Vocabulary:	Vocabulary: Network WIFI Wireless Wired Packet FTP – File Transfer Protocol Data	Vocabulary: Peer to Peer Internet Service Provider Checksum Packet	Vocabulary: Local Area Network Virtual Private Network Routing Boolean ASCII Binary IP Address	Vocabulary: ISP (Internet Service Provider)



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Computer Science – Computational Thinking						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Understand that many everyday devices respond to commands.</p>	<p>Explain that decomposition means breaking a problem down into smaller parts.</p> <p>Use decomposition to solve unplugged challenges.</p> <p>Use logical reasoning to predict the behaviour of simple programs.</p> <p>Demonstrate the skills associated with sequencing in unplugged activities.</p> <p>Show 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>Assemble instructions into a simple algorithm.</p>	<p>Articulate what decomposition is.</p> <p>Decompose a game to predict the algorithms used to create it.</p> <p>Use decomposition to decompose a story into smaller parts.</p> <p>Explain the concept abstraction.</p> <p>Explain that there are different levels of abstraction.</p> <p>Articulate what an algorithm is.</p> <p>Follow an algorithm.</p> <p>Create a clear and precise algorithm.</p> <p>Understand that computers use algorithms to make predictions.</p> <p>Understand that programs execute by following precise instructions.</p> <p>Incorporate loops within an algorithm.</p>	<p>Use decomposition to explain the parts of a laptop computer.</p> <p>Use decomposition to explore the code behind an animation.</p> <p>Use repetition in programs.</p> <p>Demonstrate that computers follow instructions.</p> <p>Create an algorithm to explain the roles of different parts of a computer.</p> <p>Use logical reasoning to explain how simple algorithms work.</p> <p>Explain the purpose of an algorithm.</p> <p>Create algorithms independently.</p>	<p>Solve unplugged problems by decomposing them into smaller parts.</p> <p>Use decomposition to understand the purpose of a script of code.</p> <p>Use decomposition to help solve problems.</p> <p>Identify patterns in programs through unplugged activities.</p> <p>Use past experiences to help solve new problems.</p> <p>Use abstraction to identify the important parts when completing both plugged and unplugged activities.</p> <p>Create algorithms for a specific purpose.</p>	<p>Decompose animations into a series of images.</p> <p>Decompose a program without support.</p> <p>Decompose a story to be able to plan a program to tell a story.</p> <p>Predict how software will work based on previous experience.</p> <p>Write more complex algorithms for a purpose.</p>	<p>Decompose a program into an algorithm.</p> <p>Use past experiences to help solve new problems.</p> <p>Write increasingly complex algorithms for a purpose.</p>
<p>Vocabulary: Device</p>	<p>Vocabulary: Decomposition Unplugged Program Sequence Algorithm</p>	<p>Vocabulary: Debug Loop</p>	<p>Vocabulary: Repetition Variable</p>	<p>Vocabulary: Abstraction Condition</p>		



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Computer Science – Programming						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Begin to follow simple instructions.</p>	<p>Program a Bee-bot/Blue-bot to follow a planned route.</p> <p>Debug instructions when things go wrong.</p> <p>Create a how to video to explain how the Vee-bot/ Blue-bot works.</p> <p>Debug an algorithm in an unplugged scenario.</p>	<p>Use logical thinking to explore software, predicting, testing and explaining what it does.</p> <p>Use an algorithm to write a basic computer program.</p> <p>Explain what loops are in a program.</p> <p>Incorporate loops to make code more efficient.</p>	<p>Consolidate KS1 knowledge to explore more complex software; predicting, testing and explaining what it does.</p> <p>Incorporate loops to make code more efficient.</p> <p>Remix existing code to include new learning.</p> <p>Use a more systematic approach to debugging code, justifying what is wrong and how it can be corrected.</p>	<p>Understand that websites can be altered by exploring the code beneath the site.</p> <p>Code a simple game.</p> <p>Use abstraction and pattern recognition to modify code.</p>	<p>Program an animation.</p> <p>Perform and develop a program as it is being created.</p> <p>Begin to use nested loops. (loops within loops)</p> <p>Debug their own code.</p> <p>Write code to create a desired effect.</p> <p>Use a range of programming commands.</p> <p>Use repetition within a program.</p> <p>Amend code within a live scenario.</p>	<p>Debug quickly and effectively to make a program more efficient.</p> <p>Remix existing code to explore a problem.</p> <p>Use and adapting nested loops.</p> <p>Program using the language Python.</p> <p>Change a program to personalise it.</p> <p>Evaluate code to understand its purpose.</p> <p>Predict code and adapting it to a chosen purpose.</p> <p>Alter a website's code to create changes.</p>
<p>Vocabulary: Equipment Buttons Movement</p>	<p>Vocabulary: Debug Algorithm Instructions Buttons Robots Patterns Program</p>	<p>Vocabulary: Logic Block Coding Compile Forward Backward Right-angle turn Algorithm Sequence Debug Predict</p>	<p>Vocabulary: Loop Sequence instructions Sequence debugging Test + improve Logo commands Sequence programming</p>	<p>Vocabulary: Abstraction CSS – Cascading Style Sheets HTML – Hyper Text Markup Language Type + edit logo commands Sensors Open-ended problems Bugs in programs Complex programming</p>	<p>Vocabulary: Animation Nested loops Repetition Explore procedures Refine procedures Variable Hardware + software control Change inputs Different outputs Articulate solutions Commands</p>	<p>Vocabulary: Binary Predicting outputs Plan, program, test & review a program Program writing Control mimics + devices Sensors Measure input Create variables Link errors</p>



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Information Technology – Using Software						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Use simple programs on a computer or tablet.	<p>Use a basic range of tools within graphic editing software.</p> <p>Take and edit photographs.</p> <p>Understand how to create digital art using an online paint tool.</p> <p>Develop control of the mouse through dragging, clicking and resizing of images to create different effects.</p> <p>Develop an understanding of different software tools.</p>	<p>Develop word processing skills, including altering text, copying and pasting and using keyboard shortcuts.</p> <p>Use word processing software to type and reformat text.</p> <p>Use software to create story animations.</p> <p>Create and labelling images.</p>	<p>Take photographs and record videos to tell a story.</p> <p>Use software to edit and enhance their video add music, sounds and text on screen with transitions.</p>	<p>Build a web page and creating content for it.</p> <p>Design and create a webpage for a given purpose.</p> <p>Use Google online software for documents, presentations, forms and spreadsheets.</p> <p>Work collaboratively with others.</p>	<p>Use logical thinking to explore software more independently, making predictions based on their previous experience.</p> <p>Use software programme Sonic Pi to create music.</p> <p>Use the animation software: Stop Motion to create video animation.</p> <p>Identify ways to improve and edit final products.</p> <p>Independently learn how to use 3D design software package TinkerCAD.</p>	<p>Use logical thinking to explore software independently, iterating ideas and testing continuously.</p> <p>Use search and word processing skills to create a presentation.</p> <p>Plan, record and edit a radio play.</p> <p>Create and edit sound recordings for a specific purpose.</p> <p>Create and edit videos, add multiple elements: music, voiceover, sound, text and transitions to make a video advert.</p> <p>Use design software TinkerCAD to design a product.</p> <p>Build a website with embedded links and multiple pages.</p>
Vocabulary: Program App	Vocabulary: Software Edit Frame resize	Vocabulary: Text Copy Align Paste Reformat	Vocabulary: Multimedia Presentations Alignment Brush size Repeats Reflections Green screening Amend Copy, paste	Vocabulary: Creating + modifying Specific purpose Photo modifying Keyboard shortcuts Bullet points Spell check Constructive feedback	Vocabulary: Online sharing Multimedia effects Multimedia modification Transitions Hyperlinks Editing tools Refining Online sharing	Vocabulary: Audience Atmosphere Structure Copyright Information collection Storing



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Information Technology – The wider use of technology						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<p>Recognise that a range of technology is used in places such as homes and schools.</p> <p>Show an interest in technological toys with knobs and pulleys, or real objects such as cameras, or mobile devices.</p> <p>Explain what they are doing using the correct vocabulary.</p>	<p>Search and download images from the internet safely.</p> <p>Recognise common uses of information technology, including beyond school.</p> <p>Recognise uses of technology beyond school.</p>	<p>Explain how computers are used in the wider world.</p>	<p>Demonstrate how to log in and out of an email account.</p> <p>Write an email including a subject, 'to' and 'from'.</p> <p>Send an email with an attachment.</p> <p>Reply to an email.</p> <p>Articulate the purpose of emails.</p>	<p>Show that software can be used collaboratively online to work as a team.</p>	<p>Develop searching skills to help find relevant information on the internet.</p> <p>Demonstrate how to use search engines effectively to find information, focussing on keyword searches and evaluating search returns.</p> <p>Explain what a search engine is and how it functions.</p>	<p>Explain how search engines work and why some searches are at the top.</p> <p>Explain about the 'Internet of Things' and how it has led to 'big data'.</p> <p>Articulate how 'big data' can be used to solve a problem or improve efficiency.</p>



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Information Technology – Handling Data						
EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
	<p>Log on to Excel and open a spreadsheet.</p> <p>Represent data in tables, charts and pictograms.</p> <p>Sort data and create branching databases.</p> <p>Articulate where digital content can have advantages over paper when storing and manipulating data.</p>	<p>Collect and input data into a spreadsheet.</p> <p>Interpret data.</p>	<p>Use confidently the vocabulary associated with databases: field, record, data.</p> <p>Articulate about the pros and cons of digital versus paper databases.</p> <p>Sort and filter databases to easily retrieve information.</p> <p>Create and interpret charts and graphs to understand data.</p>	<p>Show through the design of a weather station, how data is gathered and recorded.</p>	<p>Understand how different forms of data is collected.</p>	<p>Understand how barcodes, QR codes and RFID work.</p> <p>Gather and analyse data in real time.</p> <p>Create formulas and sort data within spreadsheets.</p>
	<p>Vocabulary:</p> <p>Photographs</p> <p>Video</p> <p>Sound</p> <p>Data</p> <p>Pictogram</p> <p>Digitally</p>	<p>Vocabulary:</p> <p>Capturing moments</p> <p>Magnified images</p> <p>Questions</p> <p>Data collection</p> <p>Graphs</p> <p>Charts</p> <p>Save</p> <p>Retrieve</p>	<p>Vocabulary:</p> <p>Questioning</p> <p>Database</p> <p>Construct</p> <p>Contribute</p> <p>Recording data</p> <p>Data logger</p> <p>Present data</p>	<p>Vocabulary:</p> <p>Database creation</p> <p>Database searches</p> <p>Inaccurate data</p>	<p>Vocabulary:</p> <p>Spreadsheets</p> <p>Complex searches (and/or: </>)</p> <p>Problem solving</p> <p>Present answers</p> <p>Analyse information</p> <p>Question data</p> <p>Interpret</p>	<p>Vocabulary:</p> <p>Generate</p> <p>Process</p> <p>Interpret</p> <p>Store</p> <p>Present information</p> <p>Plausibility</p> <p>Appropriate data tool</p> <p>Interrogate</p> <p>Investigations</p>



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Digital Literacy – e-Safety

EYFS	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Say when I am on the internet and when I am not.	<p>Log in and out and save 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>Explain what personal information is.</p> <p>Talk about why it is important to be kind online.</p>	<p>Understand how to stay safe when talking to people online.</p> <p>Understand not to share personal information and what to do if they see or hear something online that makes them feel upset or uncomfortable.</p> <p>Explain why you should go online for a short amount of time.</p> <p>Recognise that not everyone who is who they say they are on the internet.</p>	<p>Articulate how to be a responsible digital citizen; understand their responsibilities to treat others respectfully and recognise when digital behaviour is unkind.</p> <p>Understand and articulate cyberbullying.</p> <p>Understand that not all emails are genuine, and how to recognise when an email might be fake and what to do about it.</p>	<p>Recognise what appropriate behaviour is when collaborating with others online.</p> <p>Recognise that information on the Internet might not be true or correct and that some sources are more trustworthy than other.</p>	<p>Identify possible dangers online and learning how to stay safe.</p> <p>Create an animation about digital safety.</p> <p>Recognise that information on the Internet might not be true or correct and learning ways of checking validity.</p> <p>Demonstrate the use of an online community safely.</p>	<p>Understand the importance of secure passwords and how to create them.</p> <p>Understand the consequences of sharing too much personal information.</p> <p>Use search engines safely and effectively.</p> <p>Recognise that updated software can help to prevent data corruption and hacking.</p> <p>Explain the consequences of spending too much time online or on a game.</p> <p>Explain how and why it is important to protect a computer or device from harm on the internet.</p>
Vocabulary: Choices Internet Website	Vocabulary: Rules Online Private information Email	Vocabulary: Appropriate/inappropriate sites Cyber-bullying Digital footprint Keyword searching	Vocabulary: E-safety rules Secure passwords Report abuse button Gaming Blogs	Vocabulary: E-safety rules Secure passwords Report abuse button Gaming Blogs	Vocabulary: Responsible online communication Informed choices Virus threats Blogs Messaging	Vocabulary: Responsible online communication Informed choices Virus threats Blogs Messaging