

	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Hardware	<p>Learning how to operate a camera to take photographs of meaningful creations or moments.</p> <p>Learning how to explore and tinker with hardware to develop familiarity and introduce relevant vocabulary.</p> <p>Recognising and identifying familiar letters and numbers on a keyboard.</p> <p>Developing basic mouse skills such as</p>	<p>Learning how to operate a camera or tablet to take photos and videos.</p> <p>Learning how to explore and tinker with hardware to find out how it works.</p> <p>Recognising that some devices are input devices and others are output devices.</p> <p>Learning where keys are located on the keyboard.</p> <p>To know that a computer</p>	<p>Understanding what a computer is and that it's 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 want it to do via its output.</p> <p>Using greater control when taking photos with cameras, tablets or computers.</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>To know what a tablet is and how it is different from a laptop/desktop computer.</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>To know the difference between ROM and</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>moving and clicking.</p> <p>To know that a mouse can be used to click, drag and create simple drawings.</p> <p>To know that you can take simple photographs with a camera or iPad.</p> <p>To know that you must hold the camera still and ensure the subject is in the shot to take a photo.</p>	<p>and mouse can be used to click, drag, fill and select and also add backgrounds, text, layers, shapes and clip art.</p>	<p>Developing confidence with the keyboard and the basics of touch typing.</p> <p>To know the difference between a desktop and laptop computer.</p> <p>To know that computers often work together.</p>			<p>RAM.</p> <p>To understand that RAM is Random Access Memory and acts as the computer's working memory.</p>	<p>Understanding how corruption can happen within data during transfer (for example when downloading, installing, copying and updating files).</p>
<p>Networks and data representation</p>	N/A	N/A	N/A	<p>Understanding the role of the key components of a network.</p>	<p>Understanding that computer networks provide</p>	<p>Learning the vocabulary associated with data: data</p>	<p>Understanding that computer networks provide</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>multiple services, such as the World Wide Web, and opportunities for communication and collaboration.</p>	<p>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</p>	<p>multiple services.</p>
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				<p>Recognising links between networks and the internet.</p> <p>Learning how data is transferred.</p> <p>To understand what a network is and how a school network might be organised.</p> <p>To know that a server is central to a network and responds to requests made.</p> <p>To know how the internet uses networks to share files.</p> <p>To know that</p>		<p>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>To know what numbers using binary code look like and be able to identify how messages can be sent in this format.</p> <p>To understand that RAM is Random Access Memory and acts as the</p>	
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				a router connects us to the internet.		computer's working memory. To know what simple operations can be used to calculate bit patterns.	
Computational thinking	Using logical reasoning to understand simple instructions and predict the outcome.	Learning that decomposition means breaking a problem down into smaller parts. Using decomposition to solve unplugged challenges. Using logical reasoning to predict the behaviour of simple programs. Developing the skills	Articulating what decomposition is. Decomposing a game to predict the algorithms used to create it. Learning that there are different levels of abstraction. Explaining what an algorithm is. Following an algorithm.	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	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	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	Decomposing a program into an Algorithm. Using past experiences to help solve new problems. Writing increasingly complex algorithms for a purpose.

		<p>associated with sequencing in unplugged activities.</p> <p>Following a basic set of instructions. Assembling instructions into a simple algorithm.</p>	<p>Creating a clear and precise algorithm.</p> <p>Learning that programs execute by following precise instructions.</p> <p>Incorporating loops within algorithms.</p> <p>To know that people control technology.</p>	<p>algorithms work.</p> <p>Explaining the purpose of an algorithm.</p> <p>Forming algorithms independently.</p>	<p>experiences to help solve new problems.</p> <p>Using abstraction to identify the important parts when completing both plugged and unplugged activities.</p>	<p>experience.</p> <p>Writing more complex algorithms for a purpose.</p>	
Programming	<p>Following instructions as part of practical activities and games.</p> <p>Learning to give simple instructions.</p>	<p>Programming a Floor robot to follow a planned route.</p> <p>Learning to debug instructions when things go wrong.</p>	<p>Using logical thinking to explore software, predicting, testing and explaining what it does.</p> <p>Using an algorithm to write a basic</p>	<p>Using logical thinking to explore more complex software; predicting, testing and explaining what it does.</p> <p>Incorporating loops to</p>	<p>Creating algorithms for a specific purpose. Coding a simple game.</p> <p>Using abstraction and pattern recognition to modify code.</p>	<p>Programming an animation. Iterating and developing their programming as they work.</p> <p>Confidently using loops in their programming</p>	<p>Debugging quickly and effectively to make a program more efficient.</p> <p>Remixing existing code to explore a Problem.</p>

	<p>Experimenting with programming a Bee-bot/Blue - bot and learning how to give simple commands.</p> <p>Learning to debug instructions, with the help of an adult, when things go wrong.</p> <p>To know that being able to follow and give simple instructions is important in computing.</p> <p>To understand that it is important for instructions to be in the right order.</p>	<p>Using programming language to explain how a floor robot works.</p> <p>Learning to debug an algorithm in an unplugged scenario.</p> <p>To understand that an algorithm is when instructions are put in an exact order.</p> <p>To know that input devices get information into a computer and that output devices get information out of a computer.</p>	<p>computer program.</p> <p>Using loop blocks when programming to repeat an instruction more than once.</p> <p>To understand what machine learning is and how that enables computers to make predictions.</p> <p>To know that loops in programming are where you set a certain instruction (or instructions) to be repeated multiple times.</p>	<p>make code more efficient.</p> <p>Continuing existing code. Making reasonable suggestions for how to debug their own and others' code.</p> <p>To know that Scratch is a programming language and some of its basic functions.</p> <p>To understand how to use loops to improve programming .</p> <p>To understand how decomposition</p>	<p>Incorporating variables to make code more efficient.</p> <p>To understand that a variable is a value that can change (depending on conditions) and know that you can create them in Scratch.</p> <p>To know what a conditional statement is in programming .</p> <p>To understand that variables can help you to create a quiz on Scratch.</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>To know that a soundtrack</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>To know that the first computers were created at Bletchley Park to crack the Enigma code to help the war effort</p>
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	<p>To understand why a set of instructions may have gone wrong.</p> <p>To know that you can program a Bee-Bot with some simple commands.</p> <p>To understand that debugging means how to fix some simple programming errors.</p> <p>To understand that an algorithm is a set of clear and precise instructions.</p>	<p>To understand that decomposition means breaking a problem into manageable chunks and that it is important in computing.</p> <p>To know that we call errors in an algorithm 'bugs' and fixing these 'debugging'.</p> <p>To understand the basic functions of a Bee-Bot. To know that you can use a camera/tablet to make simple videos.</p>	<p>To know that abstraction is the removing of unnecessary detail to help solve a problem.</p> <p>To know that coding is writing in a special language so that the computer understands what to do.</p> <p>To understand that the character in ScratchJr is controlled by the programming blocks.</p> <p>To know that you can write a program to create a</p>	<p>n is used in programming .</p> <p>To understand that you can remix and adapt existing code.</p>	<p>To know that combining computational thinking skills (sequence, abstraction, decomposition etc) can help you to solve a problem.</p> <p>To understand that pattern recognition means identifying patterns to help them work out how the code works.</p> <p>To understand that algorithms can be used for a number of purposes e.g.</p>	<p>is music for a film/video and that one way of composing these is on programming software.</p> <p>To understand that using loops can make the process of writing music simpler and more effective.</p> <p>To know how to adapt their code while performing their music.</p> <p>To know that a Micro:bit is a programmable device.</p> <p>To know that</p>	<p>in World War 2.</p> <p>To know about some of the historical figures that contributed to technological advances in computing.</p> <p>To know that there are text-based programming languages such as Logo and Python.</p> <p>To know that nested loops are loops inside of loops.</p> <p>To understand the use of random numbers and remix Python code.</p>
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		To know that algorithms move a bee-bot accurately to a chosen destination.	musical instrument or tell a joke.		animation, games design etc.	uses a block coding language similar to Scratch. To understand and recognise coding structures including variables. To know what techniques to use to create a program for a specific purpose (including decomposition).	
Using software	Using a simple online paint tool to create digital art.	Using a basic range of tools within graphic editing software. Taking and editing photographs.	Developing word processing skills, including altering text, copying and pasting and using keyboard	Taking photographs and recording video to tell a story. Using software to edit and	Building a web page and creating content for it. Designing and creating a webpage for a given purpose.	Using logical thinking to explore software more independently, making predictions based on their previous	Using logical thinking to explore software independently, iterating ideas and testing continuously.

		<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>To understand that holding the camera still and considering angles and light are important to take good pictures.</p> <p>To know that you can edit, crop and filter</p>	<p>shortcuts.</p> <p>Using word processing software to type and reformat text.</p> <p>Using software (and unplugged means) to create story animations.</p> <p>Creating and labelling images.</p> <p>To understand that an animation is made up of a sequence of photographs.</p> <p>To know that small changes in my frames will create a smoother looking</p>	<p>enhance their video adding music, sounds and text on screen with transitions</p> <p>To know that different types of camera shots can make my photos or videos look more effective.</p> <p>To know that I can edit photos and videos using film editing software.</p> <p>To understand that I can add transitions and text to my video.</p> <p>To</p>	<p>Use online software for documents, presentations, forms and spreadsheets.</p> <p>Using software to work collaboratively with others.</p> <p>To know some of the features of web design software.</p> <p>To know that a website is a collection of pages that are all connected.</p> <p>To know that websites usually have a homepage and subpages as</p>	<p>experience.</p> <p>Using software programme Sonic Pi/Scratch to create music.</p> <p>Using the video editing software to Animate.</p> <p>Identify ways to improve and edit programs, videos, images etc.</p> <p>Independently learning how to use 3D design software package TinkerCAD.</p> <p>To understand that stop motion</p>	<p>Using search and word processing skills to create a presentation.</p> <p>Creating and editing sound recordings for a specific purpose.</p> <p>Creating and editing videos, adding multiple elements: music, voiceover, sound, text and transitions.</p> <p>Using design software TinkerCAD to design a product.</p> <p>Creating a website with</p>
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		<p>photographs.</p> <p>To know how to search safely for images online.</p> <p>To know some of the simple graphic design features of a piece of online software.</p>	<p>animation.</p> <p>To understand what software creates simple animations and some of its features e.g. onion skinning.</p> <p>To know that I can make text a different style, size and colour.</p> <p>To know that "copy and paste" is a quick way of duplicating text.</p> <p>To know that touch typing is the fastest way to type.</p>	<p>understand that software can be used collaboratively online to work as a team.</p>	<p>well as clickable links to new pages, called hyperlinks.</p> <p>To know that websites should be informative and interactive.</p>	<p>animation is an animation filmed one frame at a time using models, and with tiny changes between each photograph.</p> <p>To know that decomposition of an idea is important when creating stop-motion animations.</p> <p>To know that editing is an important feature of making and improving a stop motion animation.</p>	<p>embedded links and multiple pages.</p> <p>To understand what techniques are required to create a presentation using appropriate software.</p> <p>To know that radio plays are plays where the audience can only hear the action so sound effects are important.</p> <p>To know that sound clips can be recorded using sound recording</p>
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							software. To know that sound clips can be edited and trimmed.
Using email and internet searches	N/A	<p>Recognising devices that are connected to the internet.</p> <p>Searching and downloading images from the internet safely.</p> <p>Understanding that we are connected to others when using the internet.</p>	<p>Searching for appropriate images to use in a document.</p> <p>Understanding what online information is.</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>To understand that email stands for 'electronic mail.'</p> <p>To know that</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</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>an attachment is an extra file added to an email.</p> <p>To understand that emails should contain appropriate and respectful content.</p> <p>To know what some of the different components inside a computer are e.g. CPU, RAM, hard drive, and how they work together.</p>	the internet for data		
Using data	Representing data through sorting and categorising objects in	Understanding that technology can be used to represent	Collecting and inputting data into a spreadsheet.	Understanding the vocabulary to do with	Understanding that data is used to forecast weather.	Understanding how data is collected in remote or dangerous	Understanding how barcodes, QR codes and RFID

	<p>unplugged scenarios.</p> <p>Representing data through physical pictograms.</p> <p>Exploring branch databases through physical games.</p> <p>To know that sorting objects into various categories can help you locate information.</p> <p>To know that using yes/no questions to find an answer is a branching database.</p> <p>To know that a pictogram is a way of</p>	<p>data in different ways: pictograms, tables, pie charts, bar charts, block graphs etc.</p> <p>Using representations to answer questions about data.</p> <p>Using software to explore and create pictograms and branching databases.</p> <p>To know how that charts and pictograms can be created using a computer.</p> <p>To understand</p>	<p>Interpreting data from a spreadsheet.</p> <p>To understand that you can enter simple data into a spreadsheet.</p> <p>To understand what steps you need to take to create an algorithm.</p> <p>To know what data to use to answer certain questions.</p> <p>To know that computers can be used to monitor supplies.</p>	<p>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>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>places.</p> <p>Understanding how data might be used to tell us about a location.</p> <p>To know how search engines work.</p> <p>To understand that anyone can create a website and therefore we should take steps to check the validity of websites.</p> <p>To know that web crawlers are computer programs that crawl through the</p>	<p>work.</p> <p>Gathering and analysing data in real time.</p> <p>Creating formulas and sorting data within spreadsheets.</p> <p>To know that data contained within barcodes and QR codes can be used by computers.</p> <p>To know that infrared waves are a way of transmitting data.</p> <p>To know that Radio Frequency</p>
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	showing information.	that a branching database is a way of classifying a group of objects. To know that computers understand different types of 'input'.				internet. To understand what copyright is. To know that Mars Rover is a motor vehicle that collects data from space by taking photos and examining samples of rock.	Identification (RFID) is a more private way of transmitting data. To know that data is often encrypted so that even if it is stolen it is not useful to the thief. To know that data can become corrupted within a network but this is less likely to happen if it is sent in 'packets'. I know that devices or that are not updated are most vulnerable to hackers.
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Wider use of technology	To know that different types of technology can be found at home and in school.	Recognising common uses of information technology, including beyond school. Understanding some of the ways we can use the internet.	Learning how computers are used in the wider world.	Understanding the purpose of emails. Recognising how social media platforms are used to interact.	Understanding that software can be used collaboratively online to work as a team. To know some of the features of web design software. To know that a website is a collection of pages that are all connected. To know that websites usually have a homepage	Learn about different forms of communication that have developed with the use of technology.	Learning about the Internet of Things and how it has led to 'big data'. Learning how 'big data' can be used to solve a problem or improve efficiency.

					<p>and subpages as well as clickable links to new pages, called hyperlinks.</p> <p>To know that websites should be informative and interactive.</p>		
Digital literacy	<p>Recognising that a range of technology is used for different purposes.</p> <p>Learning to log in and log out.</p> <p>To know that "log in and log out" means to begin and end a connection</p>	<p>Logging in and out and saving work on their own account.</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</p>	<p>Learning how to create a strong password.</p> <p>Understanding how to stay safe when talking to people online and what to do if they see or hear something online that makes them feel upset or uncomfortable</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</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</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</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</p>

	<p>with a computer.</p> <p>To know that to use a computer you need to log in to it and then log out at the end of your session.</p>	<p>uncomfortable.</p> <p>Understanding how to interact safely with others online.</p> <p>Recognising how actions on the internet can affect others.</p> <p>Recognising what a digital footprint is and how to be careful about what we post.</p> <p>To know that "log in and log out" means to begin and end a connection with a computer.</p> <p>To know that</p>	<p>e.</p> <p>Identifying whether information is safe or unsafe to be shared online.</p> <p>Learning to be respectful of others when sharing online and ask for their permission before sharing content.</p> <p>Learning strategies for checking if something they read online is true.</p>	<p>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>To know what type of comments and suggestions on a collaborative document can be helpful.</p>	<p>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>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>secure passwords and how to create them.</p> <p>Learning strategies to capture evidence of online bullying in order to seek help. Using search engines safely and effectively.</p> <p>Recognising that updated software can help to prevent data corruption and hacking.</p> <p>To understand the importance of having a secure password and what</p>
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		<p>passwords are important for security.</p> <p>To know that when we create something on a computer it can be more easily saved and shared than a paper version.</p>		<p>To know that you can use images, text, transitions and animation in presentation slides.</p>			<p>"brute force hacking" is.</p>
Online safety	N/A	<p>To know that the internet is many devices connected to one another.</p> <p>To know that you should tell a trusted adult if you feel unsafe or worried online.</p> <p>To know that people you do not know on the</p>	<p>To understand the difference between online and offline.</p> <p>To understand what information I should not post online.</p> <p>To know what the techniques are for creating a</p>	<p>To know that not everything on the internet is true: people share facts, beliefs and opinions online.</p> <p>To understand that the internet can affect your moods and feelings.</p> <p>To know that</p>	<p>To understand some of the methods used to encourage people to buy things online.</p> <p>To understand that technology can be designed to act like or impersonate living things.</p>	<p>To know different ways we can communicate online.</p> <p>To understand how online information can be used to form judgements.</p> <p>To understand some ways to deal with online</p>	<p>To know that a 'digital footprint' means the information that exists on the internet as a result of a person's online activity.</p> <p>To know what steps are required to capture bullying content as evidence.</p>

		<p>internet (online) are strangers and are not always who they say they are.</p> <p>To know that to stay safe online it is important to keep personal information safe.</p> <p>To know that 'sharing online means giving something specific to someone else via the internet and 'posting' online means placing information on the internet.</p>	<p>strong password.</p> <p>To know that you should ask permission from others before sharing about them online and that they have the right to say 'no.'</p> <p>To understand that not everything I see or read online is true.</p>	<p>privacy settings limit who can access your important personal information. Information, such as your name, age, gender etc.</p> <p>To know what social media is and that age restrictions apply.</p>	<p>To understand that technology can be a distraction and identify when someone might need to limit the amount of time spent using technology.</p> <p>To understand what behaviours are appropriate in order to stay safe and be respectful online.</p>	<p>bullying.</p> <p>To know that apps require permission to access private information and that you can alter the permissions.</p> <p>To know where I can go for support if I am being bullied online or feel that my health is being affected by time online.</p>	<p>To understand that it is important to manage personal passwords effectively.</p> <p>To understand what it means to have a positive online reputation.</p> <p>To know some common online scams.</p>
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