

Baydon St Nicholas Computing Knowledge Progression (Kapow Scheme)

Know ledge	Computing Systems and Networks	Programming	Creating Media	Data Handling	Online Safety	Looking Ahead
EYFS RECEPTION	- To be able to understand what a computer keyboard is and recognising some letters and numbers. - To know that a mouse can be used to click, drag and create simple drawings. - To know that to use a computer you need to log in to it and then log out at the end of your session. - To know that different types of technology can be found at home and in school. - To know that you can take simple photographs with a camera or iPad. - To know that you must hold the camera still and ensure the subject is in the shot to take a photo.	- To know that being able to follow and give simple instructions is important in computing. - To understand that it is important for instructions to be in the right order. - To understand why a set of instructions may have gone wrong. - To know that you can program a Bee-Bot with some simple commands. - To understand that debugging means how to fix some simple programming errors. - To understand that an algorithm is a set of clear and precise instructions.		- To know that sorting objects into various categories can help you locate information. - To know that using yes/no questions to find an answer is a branching database. - To know that a pictogram is a way of showing information.	Being online *To know that 'online' means being connected to other devices or the internet. (*Statement also found in Computing systems.) To know that an 'account' is a personal space within an online program. Online relationships To know they should not speak to or message unfamiliar people online. To know that they can still hurt someone's feelings online. Risks and harms To know that passwords help keep online accounts and programs safe. To know that passwords help keep online accounts and programs safe. To know that logging in to their account helps keep them safe online. Responsible and safe use To know that using someone else's login is not safe or respectful. Reporting online To know who to report concerns to about online content or if they receive messages from someone they don't know. To know they should tell an adult if something in their account has changed.	END of Key Stage 1 (Year 2) Computing systems and networks Recognise common uses of information technology beyond school. Use technology purposefully to create, organise, store, manipulate and retrieve digital content. Programming: Understand what algorithms are, how they are implemented as programs on digital devices and that programs execute by following precise and unambiguous instructions. Create and debug simple programs. Use logical reasoning to predict the behaviour of simple programs. Creating media: Use technology purposefully to create, organise, store, manipulate and retrieve digital content. Data handling: Use technology purposefully to create, organise, store, manipulate and retrieve digital content. Online safety: Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

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KS1 Year 1 & Year 2	Identifying and operating hardware To know the names of common digital devices (e.g., computer, tablet, camera). To know the names of the parts of the device (e.g., screen, keyboard, mouse). To know that button presses and movements of the mouse, trackpad or on the touchscreen are inputs. To know that the screen or speaker produces an output. To know that IT is a part of our everyday life and the world we live in. Networks To know that online means to be connected to other devices or the internet. To know that some digital devices are online. To know that some parts of websites are linked together. To know that there are visual clues on websites to show the links. Data storage To know that computer files need a name so they can be found again. To know that their work can be saved on a digital device. To know that their work can be organised into folders so that they can find it easily. To know that icons are used across digital devices. Digital security To know that people should have different passwords. To know that passwords keep things safe. To know that strong passwords can't be easily guessed by others. To know that passwords mean that they can share devices in school.	Understanding programming To know that humans need to give robots instructions to follow and that they will carry out these instructions exactly, even if they are wrong. To know that humans need to give instructions in the correct language for the robot to understand. To know that programming a computer or device involves giving it instructions to perform specific tasks To know that video games, phones, websites and apps are all created using programming. To know that different devices and programs use different programming languages or 'codes'. Plan To know that instructions (algorithms) must give every step of a task. To know that an algorithm must give clear, sequenced instructions. To know that an algorithm is a set of instructions used to carry out a task. To know that an algorithm becomes a program when it is coded. To know that programs execute the exact instructions they are given, even if they are incorrect. To know that a program is a series of instructions (algorithms) that are written for a computer to follow. Evaluate To know that there may be an error if a set of instructions (an algorithm) does not give the expected result. To know that errors could result from sequencing, unclear instructions or missing steps. To know that there must be an error if a program does not execute as expected. To know that an error in a computer program is known as a 'bug' and fixing errors is known as 'debugging'.	Plan To know that ordering ideas is important to make content clear. To know that digital tools can be used to make content that is presented clearly. To know that digital content should be organised to suit its purpose and audience. Create - Creating digital content To know that programs and apps can be used to create simple content such as pictures and text. To know that different tools in a program or app can change how digital content looks (e.g., colour, shape, formatting tools). To know that a word processing program or app can be used to create text. (e.g. letter keys, spacebar, caps lock, enter) To know that using digital tools to create content can make it easier to change. To know that the cursor shows where content appears on a screen. To know that text and images can be combined to make digital content. To know that cut and paste can be used to change the position of text or images. Create - Design principles To know that colours, shapes and space can be used to make content clearer and more interesting. To know that size, position and space can be used to organise digital content. To know that different fonts and colours can make text easier to read. To know that images and text work together to communicate. Evaluate To know that digital content can be changed and improved. To know that digital content should be organised, clear and easy to understand. To know that checking digital content helps to find and fix mistakes.	Understanding data To know that there are many reasons to gather data. To know that data can be grouped and organised in different ways. To know that information can be shown as pictures or symbols. Plan To know that data can come from asking people questions, To know that sorting and grouping things can help us spot patterns. To know that objects can be sorted based on their characteristics (e.g., colour, size, shape). Create To know that a tally chart is way to record and count data. To know that a pictogram is a way to record data as pictures. Evaluate To know that data can be counted and compared to find answers.	Being online *To know that 'online' means being connected to other devices or the internet. (*Statement also found in Computing systems.) To know that an 'account' is a personal space within an online program. Online relationships To know they should not speak to or message unfamiliar people online. To know that they can still hurt someone's feelings online. Risks and harms To know that passwords help keep online accounts and programs safe. To know that logging in to their account helps keeps them safe online. Responsible and safe use To know that using someone else's login is not safe or respectful. Reporting online To know who to report concerns to about online content or if they receive messages from someone they don't know. To know they should tell an adult if something in their account has changed.	END of Key Stage 1 (Year 2) Computing systems and networks Recognise common uses of information technology beyond school. Use technology purposefully to create, organise, store, manipulate and retrieve digital content. Programming: Understand what algorithms are, how they are implemented as programs on digital devices and that programs execute by following precise and unambiguous instructions. Create and debug simple programs. Use logical reasoning to predict the behaviour of simple programs. Creating media: Use technology purposefully to create, organise, store, manipulate and retrieve digital content. Data handling: Use technology purposefully to create, organise, store, manipulate and retrieve digital content. Online safety: Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

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LOW ER KS2 Year 3 & Year 4	Identifying and operating hardware To know that a peripheral is something that you can connect to a device. To know that ports are where peripherals can be attached. To know that a computer is made from different components that do different jobs. To know that some peripherals connect wirelessly. Networks To know that a network is a group of two or more connected computers. To know that networks are made up of components such as servers, routers and switches. To know that networks allow devices to share information and resources (e.g. printers and files). To know that some networks are local and some are global. To know what happens when they access a website. To know that text, images and videos on the internet are all forms of data. To know the world wide web consists of web pages and websites. To know that the internet enables collaboration and communication. To know the history and evolution of the internet Data storage To know that there are different places to save their work. To know the difference between local, network and cloud storage. To know that a server stores information and services. Digital security To know that some areas on a network or device are restricted. To know that permission means they can access part of a network. To know that different logins have different purposes. To know that the school network is a private system that can only be accessed at school.	Understanding programming To know that websites have all been programmed, often using HTML. To know that programming languages can be visual (Scratch) or text-based (HTML). To know that 'coding' is the process of turning an algorithm into a programming language. To know that HTML tells a browser how to display text, images and multimedia on a webpage. Plan To know that 'decomposition' is the process of breaking down a task or problem into smaller parts. To know that breaking down a problem into smaller parts makes it easier to solve the problem. To know that 'abstraction' is identifying the important detail and ignoring irrelevant information. Create To know that loops are used to save time when writing code by reducing repetition. To know that a variable is a container or holder for storing information that can change, e.g. numbers or text. To know that conditional statements tell the computer what to do next based on a user's input. Evaluate To know that it is important to identify where the mistake is in the programming as part of the debugging process. To know that errors in a program could result from sequencing errors, coding errors or missing code.	Plan To know that websites are created using carefully selected and created media. To know that digital images (e.g. photos and videos) and websites are created with different goals in mind. Create - Creating digital content To know that a wider range of digital content (e.g., text, images, audio, video) can be combined to communicate. To know that web page building tools can be used to create a website. To know that digital images can be edited and manipulated. To know that AI can be used to enhance images and videos. To know that templates within programs or apps help organise digital content. Create - Design principles To know that a timeline with layers is a way of organising video content. Evaluate To know that digital content should be suitable for the intended audience and purpose. To know that editing and refining digital content is part of the process.	Understanding data To know that a spreadsheet is a digital tool to organise store and display data. To know that a spreadsheet is made up of cells, rows and columns. To know that each cell in a spreadsheet can be hold text or numbers. Plan To know that data can come from various sources. To know that data is recorded in text or numbers. Create To know that data can be recorded and organised in spreadsheets. To know that digital tools can help to sort, filter and present data in different ways. Evaluate To know that data can be used to understand and explain information. To know that not all data shows a clear pattern.	Being online To know that online games allow players to interact with each other in various ways. Online relationships To know that connecting online can involve actions such as liking, commenting, emoting and chatting. To know that if behaviour is unacceptable in-person, it is unacceptable online. Risks and harms To know that usernames should not contain personal information. To know that not everyone online is who they claim to be. To know that online bullying is repeated unkind behaviour. Responsible and safe use To know that being anonymous online does not make unkind behaviour acceptable. Reporting concerns To know reporting problems online to a trusted adult is an important part of staying safe.	END of Key Stage 2 Computing systems and networks Understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration. Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. Programming Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. Creating media: Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information. Online safety: Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

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Upper KS2 Year 5 & Year 6	Identifying and operating hardware To know that hardware problems can be solved by checking connections and settings. Networks To know that search engine results are ranked and influenced by factors like keywords, advertisements and popularity. To know that packets of data travel across the internet using a system of IP addresses. To know that each packet contains pieces of data and the instructions on how to assemble them in the right order. To know that files or requests sent across a network pass through different devices. To know that websites are hosted on servers. To know the history and evolution of computer systems. Data storage To know that downloading is copying data from one storage place to another, like from the cloud to a local device. To know that using a cloud or a network to store data is more reliable than storing data locally. Digital security To know that networks need security to prevent cyber attacks. To know that hackers gain access to networks or devices unlawfully.	Understanding programming To know that code may sometimes need to be downloaded onto a physical system/device. To know that devices with sensors (such as pedometers, security systems, thermostats and light sensors) are often programmed to perform specific tasks in reaction to the input from the sensors. Plan To know that programmers often save time when creating code by taking code from one program and turning it into another. Create To know that nested loops are loops within loops. To know that it is important to follow the syntax rules in a programming language so the computer understands what we are trying to tell it but that we do not need to remember all these rules. To know that computers use pixels to measure length in digital visuals. To know that positions are often understood by a computer as x and y coordinates. To know that turns or rotations are often described as degrees. To know that many text-based coding languages use brackets or indentation to show which code belongs to a particular function or loop. To know that typing and spacing are very important in text-based languages and can cause errors in code if used incorrectly. Evaluate To know that running a program to identify errors should be done before checking the code. To know that errors in a program could be as a result of forgetting to 'end' a loop. To know that typing and spacing are very important in text-based languages and can cause errors in code if used incorrectly.	Plan To know that digital content should achieve a given goal. To know that recording a project plan in an efficient way helps with organisation. Create - Creating digital content To know that audio clips can be cut into smaller parts. To know that combining many still images can create the effect of movement. To know that AI tools can generate and edit digital content, such as text, images, or audio, and that AI-generated content requires human refinement. Create - Design principles To know that keeping digital content simple and consistent makes it easier for people to use and understand. To know that different audiences may require different design choices (e.g., using high contrast for readability). Evaluate To know that having specific criteria helps to evaluate and improve digital content.	Understanding data To know that a spreadsheet is a digital tool to organise, analyse, store and display data. To know that a spreadsheet can hold more complex information. To know that each cell in a spreadsheet can be hold simple formulas. Plan To know that data must be accurate to be reliable. To know that a larger data set gives a more complete picture. Create To know that SUM formulas create a total. To know that formulas and functions can be used to manipulate data automatically. Evaluate To know that refining a data set can make the information clearer. To know that filters can be used to narrow a dataset to the most relevant information.	Being online To know that online platforms are digital spaces, such as apps or websites, where people interact. To know that online platforms show digital content based on the things they have liked, watched or subscribed to. Online relationships To know that interactions through online platforms such as social media should still be polite and respectful. To know that people may present themselves differently online. Risks and harms To know that the things they share and post online can remain online. To know that once something is shared online, it cannot always be deleted or fully removed. To know that sharing images or posting comments online is often public. Responsible and safe use To know that social media platforms have age restrictions. To know that if they are under the age limit for a particular online platform or app, they should not create an account. Reporting concerns To know that the block and mute tools can stop people from contacting them online. To know that reporting or flagging content online will anonymously alert someone to a problem.	END of Key Stage 2 Computing systems and networks Understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration. Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. Programming Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. Creating media: Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information. Online safety: Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.