Hunningley Primary Academy
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	Unit	Substantive Knowledge	Disciplinary Knowledge
Reception	Computing Systems and Networks	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.	**Computer Science** Learning how to operate a camera to take photographs of meaningful creations or moments. Learning how to explore and tinker with hardware to develop familiarity and introduce relevant vocabulary. Recognising and identifying familiar letters and numbers on a keyboard. Developing basic mouse skills such as moving and clicking. **Information Technology** Using a simple online paint tool to create digital art. **Digital Literacy** Learning to log in and log out.
	Programming 1	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.	**Computer Science** Using logical reasoning to understand simple instructions and predict the outcome. Following instructions as part of practical activities and games. Learning to give simple instructions. Experimenting with programming a Bee-bot/ Blue-bot and learning how to give simple commands. Learning to debug instructions, with the help of an adult, when things go wrong. **Information Technology** Using a simple online paint tool to create digital art. **Digital Literacy** Learning to log in and log out.
	Creating Media		
	Data Handling	To know that sorting objects into various categories can help you locate information.	**Information Technology**

		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.	Representing data through sorting and categorising objects in unplugged scenarios. Representing data through pictograms. Exploring branch databases through physical games. **Digital Literacy** Learning to log in and log out.
	Online Safety		
Year 1	Computing Systems and Networks	To know that "log in and log out" means to begin and end a connection with a computer. To know that a computer and mouse can be used to click, drag, fill and select and also add backgrounds, text, layers, shapes and clip art. To know that passwords are important for security. To know that when we create something on a computer it can be more easily saved and shared than a paper version. To know some of the simple graphic design features of a piece of online software	**Computer Science** Learning how to explore and tinker with hardware to find out how it works. Learning where keys are located on the keyboard. **Information Technology** Using a basic range of tools within graphic editing software. Developing control of the mouse through dragging, clicking and resizing of images to create different effects. Information technology Developing understanding of different software tools. Recognising devices that are connected to the internet. **Digital Literacy** Logging in and out and saving work on their own account.
	Programming 1	To understand that an algorithm is when instructions are put in an exact order. To know that input devices get information into a computer and that output devices get information out of a computer. To understand that decomposition means breaking a problem into manageable chunks and that it is important in computing. To know that we call errors in an algorithm 'bugs' and fixing these 'debugging'. To understand the basic functions of a Bee-Bot. To know that you can use a camera/tablet to make simple videos. To know that algorithms move a bee-bot accurately to a chosen destination.	**Computer Science** Learning how to explore and tinker with hardware to find out how it works. Recognising that some devices are input devices and others are output devices. Learning where keys are located on the keyboard. Learning how to operate a camera to take photos and videos.

			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 associated with sequencing in unplugged activities. **Information Technology** Taking and editing photographs.
	Creating Media	To understand that holding the camera still and considering angles and light are important to take good pictures. To know that you can edit, crop and filter photographs. To know how to search safely for images online.	**Computer Science** Learning how to explore and tinker with hardware to find out how it works. Learning where keys are located on the keyboard. **Information Technology** Using a basic range of tools within graphic editing software. Developing control of the mouse through dragging, clicking and resizing of images to create different effects. Information technology Developing understanding of different software tools. Recognising devices that are connected to the internet. **Digital Literacy** Logging in and out and saving work on their own account.
	Data Handling	To know how that charts and pictograms can be created using a computer. To understand that a branching database is a way of classifying a group of objects. To know that computers understand different types of 'input'.	**Computer Science** Learning how to explore and tinker with hardware to find out how it works. Recognising that some devices are input devices and others are output devices Learning where keys are located on the keyboard. Information Technology

			Understanding that technology can be used to represent data in different ways: pictograms, tables, pie charts, bar charts, block graphs etc. Using data representations to answer questions about data. Using software to explore and create pictograms and branching databases.
	Online Safety	To know that the internet is many devices connected to one another. To know that you should tell a trusted adult if you feel unsafe or worried online. To know that people you do not know on the internet (online) are strangers and are not always who they say they are. To know that to stay safe online it is important to keep personal information safe. To know that 'sharing online means giving something specific to someone else via the internet and 'posting' online means placing information on the internet.	
	Unit	**Substantive Knowledge**	**Disciplinary Knowledge**
Year 2	Computing Systems and Networks	To know the difference between a desktop and laptop computer. To know that people control technology. To know that buttons are a form of input that give a computer an instruction about what to do (output). To know that computers often work together. To know that touch typing is the fastest way to type. To know that I can make text a different style, size and colour. To know that "copy and paste" is a quick way of duplicating text.	**Computer Science** Understanding what a computer is and that it's made up of different components. Recognising that buttons cause effects and that technology follows instructions. Learning how we know that technology is doing what we want it to do via its output. Using greater control when taking photos with cameras, tablets or computers. **Information Technology** Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts. Information technology Using word processing software to type and reformat text.

			Creating and labelling images. Learning how computers are used in the wider world. . **Digital Literacy** Identifying whether information is safe or unsafe to be shared online. .
	Programming 1	To understand what machine learning is and how that enables computers to make predictions. To know that loops in programming are where you set a certain instruction (or instructions) to be repeated multiple times. To know that abstraction is the removing of unnecessary detail to help solve a problem. To know that coding is writing in a special language so that the computer understands what to do. To understand that the character in ScratchJr is controlled by the programming blocks. To know that you can write a program to create a musical instrument or tell a joke. That programming a computer or device involves giving it instructions to perform specific tasks. That video games, phones, websites and apps are all created using programming. That different devices and programs use different programming languages or 'codes'. That an algorithm becomes a program when it is coded. That programs execute the exact instructions they are given, even if they are incorrect. That a program is a series of instructions (algorithms) that are written for a computer to follow. That a person can program a device by giving it an algorithm/algorithms to follow. That there must be an error if a program does not execute as expected. That an error in a computer program is known as a 'bug' and fixing errors is known as 'debugging'.	**Computer Science** Developing confidence with the keyboard and the basics of touch typing. 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. ollowing an algorithm. Creating a clear and precise algorithm. Learning that programs execute by following precise instructions. Incorporating loops within algorithms. Using logical thinking to explore software, predicting, testing and explaining what it does. Using an algorithm to write a basic computer program. Using loop blocks when programming to repeat an instruction more than once. **Information Technology** Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts. Using software (and unplugged means) to create story animations.

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Unit	Substantive Knowledge	Disciplinary Knowledge
Creating Media	To understand that an animation is made up of a sequence of photographs. To know that small changes in my frames will create a smoother looking animation. To understand what software creates simple animations and some of its features e.g. onion skinning.	**Computer Science** Using greater control when taking photos with cameras, tablets or computers Using logical thinking to explore software, predicting, testing and explaining what it does. **Information Technology** Using software (and unplugged means) to create story animations.
Data Handling	To understand that you can enter simple data into a spreadsheet. To understand what steps you need to take to create an algorithm. To know what data to use to answer certain questions. To know that computers can be used to monitor supplies.	**Computer Science** Developing confidence with the keyboard and the basics of touch typing **Information Technology** Creating and labelling images Collecting and inputting data into a spreadsheet. Interpreting data from a spreadsheet. Learning how computers are used in the wider world. .
Online Safety	To understand the difference between online and offline. To understand what information I should not post online. To know what the techniques are for creating a strong password. To know that you should ask permission from others before sharing about them online and that they have the right to say 'no.' To understand that not everything I see or read online is true.	**Digital Literacy** Identifying whether information is safe or unsafe to be shared online. Learning how to create a strong password. Learning to be respectful of others when sharing online and ask for their permission before sharing content. Learning strategies for checking if something they read online is true. 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.

Year

Computing Whole School Overview

	Computing Systems and Networks	To know what a tablet is and how it is different from a laptop/desktop computer. To know the components that make up a network (Wireless access point/WAP, Network switch, Router, Server and devices). To know that a server is central to a network and responds to requests made. To know that the internet connects all the networks around the world. To know that a router connects us to the internet. To know what a packet is and why it is important for website data transfer. To know the roles that inputs and outputs play on computers. To understand that email stands for 'electronic mail.' To know that an attachment is an extra file added to an email. To understand that emails should contain appropriate and respectful content. To know what some of the different components inside a computer are e.g. CPU, RAM, hard drive, and how	**Computer Science** Understanding the role of the key components of a network. Understanding that websites & videos are files that are shared from one computer to another. Learning about the role of packets. Understanding how networks work and their purpose. Identifying the key components within a network, including whether they are wired or wireless. Recognising links between networks and the internet. **Information Technology** 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. . **Digital Literacy** Learning about cyberbullying. Learning that not all emails are genuine, recognising when an email might be fake and what to do about it
	Programming 1	To know that Scratch is a programming language and some of its basic functions. To understand how to use loops to improve programming. To understand how decomposition is used in programming. To understand that you can remix and adapt existing code.	**Computer Science** 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.

			Using logical thinking to explore more complex software; predicting, testing and explaining what it does. Incorporating loops to make code more efficient. Continuing existing code. Making reasonable suggestions for how to debug their own and others' code. 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.
	Creating Media	To know that different types of camera shots can make my photos or videos look more effective. To know that I can edit photos and videos using film editing software. To understand that I can add transitions and text to my video.	**Computer Science** Using logical thinking to explore more complex software; predicting, testing and explaining what it does **Information Technology** Taking photographs and recording video to tell a story. Information technology Using software to edit and enhance their video adding music, sounds and text on screen with transitions
	Data Handling	To know that a database is a collection of data stored in a logical, structured and orderly manner.	**Computer Science**

		To know that computer databases can be useful for sorting and filtering data. To know that different visual representations of data can be made on a computer.	Using logical thinking to explore more complex software; predicting, testing and explaining what it does **Information Technology** 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.
	Online Safety	To know that not everything on the internet is true: people share facts, beliefs and opinions online. To understand that the internet can affect your moods and feelings. To know that privacy settings limit who can access your important personal information Information, such as your name, age, gender etc. To know what social media is and that age restrictions apply.	**Digital Literacy** Recognising that different information is shared online including facts, beliefs and opinions. Learning how to identify reliable information when searching online. Learning how to stay safe on social media. Considering the impact technology can have on mood.
Year 4	**Unit**	**Substantive Knowledge**	**Disciplinary Knowledge**
	Computing Systems and Networks	To understand that software can be used collaboratively online to work as a team. To know what type of comments and suggestions on a collaborative document can be helpful. To know that you can use images, text, transitions and animation in presentation slides.	**Computer Science** Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration **Information Technology** Use online software for documents, presentations, forms and spreadsheets. Using software to work collaboratively with others Understanding that software can be used collaboratively online to work as a team.

Computing Whole School Overview

	Programming 1	To understand that a variable is a value that can change (depending on conditions) and know that you can create them in Scratch. To know what a conditional statement is in programming. To understand that variables can help you to create a quiz on Scratch. To know that combining computational thinking skills (sequence, abstraction, decomposition etc) can help you to solve a problem. To understand that pattern recognition means identifying patterns to help them work out how the code works. To understand that algorithms can be used for a number of purposes e.g. animation, games design etc. To know 'decomposition' is the process of breaking down a task or problem into smaller parts. To know breaking down a problem into smaller parts makes it easier to solve the problem. To know 'abstraction' is identifying the important detail and ignoring irrelevant information. To know loops are used to save time when writing code by reducing repetition. To know a variable is a container or holder for storing information that can change, e.g. numbers or text. To know conditional statements tell the computer what to do next based on a user's input. To know It is important to identify where the mistake is in the programming as part of the debugging process. To know errors in a program could result from sequencing errors, coding errors or missing code	**Computer Science** Using decomposition to solve a problem by finding out what code was used. Using decomposition to understand the purpose of a script of code. Creating algorithms for a specific purpose. Coding a simple game 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. 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. 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.' **Digital Literacy** Recognising what appropriate behaviour is when collaborating with others online.
	Creating Media	To understand that stop motion animation is an animation filmed one frame at a time using models, and with tiny changes between each photograph.	**Information Technology** Building a web page and creating content for it. Information technology

		To know that decomposition of an idea is important when creating stop-motion animations. To know that editing is an important feature of making and improving a stop motion animation.	Designing and creating a webpage for a given purpose. Using software to work collaboratively with others.
	Data Handling	To know that computers can use different forms of input to sense the world around them so that they can record and respond to data. This is called 'sensor data'. To know that a weather machine is an automated machine that responds to sensor data. To understand that weather forecasters use specific language, expression and pre-prepared scripts to help create weather forecast films.	**Computer Science** Using tablets or digital cameras to film a weather forecast. Understanding that weather stations use sensors to gather and record data which predicts the weather. **Information Technology** Searching the internet for data. Designing a device which gathers and records sensor data. Using keywords to effectively search for information on the internet Recording data in a spreadsheet independently. Sorting data in a spreadsheet to compare using the 'sort by...' option. Understanding that data is used to forecast weather
	Online Safety	To understand some of the methods used to encourage people to buy things online. To understand that technology can be designed to act like or impersonate living things. To understand that technology can be a distraction and identify when someone might need to limit the amount of time spent using technology. To understand what behaviours are appropriate in order to stay safe and be respectful online.	**Digital Literacy** Learning to make judgements about the accuracy of online searches. Digital literacy Identifying forms of advertising online. Recognising what appropriate behaviour is when collaborating with others online. Reflecting on the positives and negatives of time online. Identifying respectful and disrespectful online behaviour. Recognising that information on the Internet might not be true or correct and

	Unit	Substantive Knowledge	Disciplinary Knowledge
			that some sources are more trustworthy than others.
Year 5	Computing Systems and Networks	To know how search engines work. To understand that anyone can create a website and therefore we should take steps to check the validity of websites. To know that web crawlers are computer programs that crawl through the internet. To understand what copyright is. To know the difference between ROM and RAM.	**Information Technology** Developing searching skills to help find relevant information on the internet. Learning how to use search engines effectively to find information, focussing on keyword searches and evaluating search returns. Learn about different forms of communication that have developed with the use of technology . **Digital Literacy** Recognising that information on the Internet might not be true or correct and learning ways of checking validity
	Programming 1	To know that a soundtrack is music for a film/video and that one way of composing these is on programming software. To understand that using loops can make the process of writing music simpler and more effective. To know how to adapt their code while performing their music. To know that a Micro:bit is a programmable device. To know that Micro:bit 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). To know that Programmers often save time when creating code by taking code from one program and turning it into another. To know that nested loops are loops within loops. 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.	**Computer Science** Predicting how software will work based on previous experience. Writing more complex algorithms for a purpose Iterating and developing their programming as they work Confidently using loops in their programming Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected. Computer science Writing code to create a desired effect. Using a range of programming commands. Using repetition within a program. Amending code within a live scenario

			Information Technology Using logical thinking to explore software more independently, making predictions based on their previous experience. Using a software programme (Sonic Pi/Scratch) to create music. dentify ways to improve and edit programs, videos, images etc.
	Creating Media	To know that sound clips can be recorded using sound recording software and that sound clips can be edited and trimmed.	**Computer Science** Decomposing animations into a series of images Decomposing a story to be able to plan a program to tell a story. **Information Technology** Using video editing software to animate
	Data Handling	To know that Mars Rover is a motor vehicle that collects data from space by taking photos and examining samples of rock. To know what numbers using binary code look like and be able to identify how messages can be sent in this format. To understand that RAM is Random Access Memory and acts as the computer's working memory. To know what simple operations can be used to calculate bit patterns.	**Computer Science** Learning that external devices can be programmed by a separate computer Recognising how the size of RAM affects the processing of data. Learning the vocabulary associated with data: data and transmit. Recognising that computers transfer data in binary and understanding simple binary addition. Relating binary signals (Boolean) to the simple character-based language, ASCII. Learning that messages can be sent by binary code, reading binary up to eight characters and carrying out binary calculations. **Information Technology** Understanding how data is collected in remote or dangerous places.

			Understanding how data might be used to tell us about a location. Learn about different forms of communication that have developed
	Online Safety	To know different ways we can communicate online. To understand how online information can be used to form judgements. To understand some ways to deal with online bullying. To know that apps require permission to access private information and that you can alter the permissions. 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.	**Digital Literacy** Identifying possible dangers online and learning how to stay safe. Digital literacy Evaluating the pros and cons of online communication. Recognising that information on the Internet might not be true or correct and learning ways of checking validity. Learning what to do if they experience bullying online. Learning to use an online community safely.

	Unit	**Substantive Knowledge**	**Disciplinary Knowledge**
Year 6	Computing Systems and Networks	To understand the importance of having a secure password and what "brute force hacking" is. To know that the first computers were created at Bletchley Park to crack the Enigma code to help the war effort in World War 2. To know about some of the historical figures that contributed to technological advances in computing. To understand what techniques are required to create a presentation using appropriate software. To know that AI is artificial intelligence and is used in everyday life. To know that AI is trained on data to recognise patterns and generate outputs. To know that AI can be used to generate written content. To know that AI can be used to create visual content like pictures. To know that AI can help generate basic HTML code to create the structure and layout of a website. To know that there are ethical issues surrounding AI, including data privacy, bias and responsible use.	**Computer Science** Learning about the history of computers and how they have evolved over time. Using the understanding of historic computers to design a computer of the future. Using past experiences to help solve new problems. Writing increasingly complex algorithms for a purpose. Debugging quickly and effectively to make a program more efficient. Remixing existing code to explore a problem. Changing a program to personalise it. Evaluating code to understand its purpose. Predicting code and adapting it to a chosen purpose. Identify different types of AI and their applications in everyday life

Computing Whole School Overview

			Analysing the effectiveness of prompts and refine them for improved AI outputs Applying coding skills like decomposition and pattern recognition to interact with AI applications **Information Technology** Using search and word processing skills to create a presentation. Planning, recording and editing an audio recording. Creating and editing sound recordings for a specific purpose. Understanding how search engines work. Using text-based and image-based AI tools to generate content **Digital Literacy** Understanding the importance of secure passwords and how to create them Using search engines safely and effectively Exploring ethical considerations around AI use and its impact on society
	Programming 1	To know that there are text-based programming languages such as Logo and Python. To know that nested loops are loops inside of loops. To understand the use of random numbers and remix Python code.	**Computer Science** Decomposing a program into an algorithm Writing increasingly complex algorithms for a purpose. Debugging quickly and effectively to make a program more efficient. Remixing existing code to explore a problem. Using and adapting nested loops. Programming using the language Python. Changing a program to personalise it. ✔ Evaluating code to understand its purpose

			Information Technology Using logical thinking to explore software independently, iterating ideas and testing continuously.
	Data Handling	To know that data contained within barcodes and QR codes can be used by computers. To know that infrared waves are a way of transmitting data. To know that Radio Frequency 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'. To know that devices or that are not updated are most vulnerable to hackers. To know the difference between mobile data and WiFi.	**Computer Science** Understanding and identifying barcodes, QR codes and RFID. Identifying devices and applications that can scan or read barcodes, QR codes and RFID. Understanding how corruption can happen within data during transfer (for example when downloading, installing, copying and updating files). Understanding that computer networks provide multiple services **Information Technology** Understanding how barcodes, QR codes and RFID work. Information technology Gathering and analysing data in real time. Creating formulas and sorting data within spreadsheets. Learning about the Internet **Digital Literacy** Using search engines safely and effectively.
	Online Safety	To know that a 'digital footprint' means the information that exists on the internet as a result of a person's online activity. To know what steps are required to capture bullying content as evidence. To understand that it is important to manage personal passwords effectively. To understand what it means to have a positive online reputation. To know some common online scams.	**Digital Literacy** Learning about the positive and negative impacts of sharing online. Digital literacy Learning strategies to create a positive online reputation. Understanding the importance of secure passwords and how to create them.

			Learning strategies to capture evidence of online bullying in order to seek help. Using search engines safely and effectively. Recognising that updated software can help to prevent data corruption and hacking

KS3 Curriculum

The KS3 Computing curriculum in the UK provides students aged 11 to 14 with a broad foundation in digital literacy, computer science, and information technology. It introduces programming through languages like Python and Scratch, teaches algorithmic thinking and data representation (such as binary and multimedia formats), and encourages computational thinking skills like abstraction and decomposition. Students also develop practical IT skills by using software for word processing, spreadsheets, presentations, and databases, while learning to create digital content and handle data effectively. Additionally, the curriculum promotes digital literacy by covering online safety, ethical use of technology, and responsible communication in digital environments.

Substantive Knowledge	Disciplinary Knowledge
Understanding what an algorithm is and how it can be represented (e.g. flowcharts, pseudocode). *Knowing how to write and debug simple programs using languages like Python or Scratch. Knowing how to use productivity software (e.g. Word, Excel, PowerPoint) effectively.* *Understanding how to create and format digital content for different audiences and purposes.* *Knowing how to collect, analyse, and present data using spreadsheets and databases.* *Understanding selection, iteration, and variables in programming.* *Recognising how computers process instructions and data.* *Knowing how to protect personal information and use secure passwords.* *Understanding the ethical and legal implications of digital content (e.g. copyright, plagiarism).* *Recognising the impact of digital technology on society and individuals.*	- Writing clear, structured code using appropriate syntax. - Testing and debugging code to identify and fix errors. - Using logical reasoning to predict and explain program behaviour. - Organising and manipulating data using spreadsheets and databases. - Interpreting and presenting data effectively using charts and graphs. - Evaluating the reliability and accuracy of data sources. - Organising and manipulating data using spreadsheets and databases. - Interpreting and presenting data effectively using charts and graphs. - Evaluating the reliability and accuracy of data sources.