Computing at Springfield

Vision

At Springfield, we believe computing is a crucial part of children's learning, as technology is now essential to navigating our present world and innovating for the future. We follow the Kapow scheme of work for computing as a robust and rigorously sequenced curriculum that breaks learning into small, sequential steps that become progressively more complex and challenging over time. The Kapow scheme ensures that pupils meet the end of Key Stage attainment targets outlined in the National Curriculum. Across a rich range of units, children master content related to computer science, such as writing algorithms, using logical reasoning to explain how algorithms work and debugging algorithms that do not meet the intended purpose. Children also learn content related to information technology such as how to use search technologies effectively, how to navigate information online and how to collect, evaluate and present data and information. Within digital literacy learning, we ensure that children are equipped with the tools to stay safe online.

In conjunction with our PSHE and RSE curriculum, our computing curriculum also meets the objectives of the DfE's *Education for a Connected World* framework. This guidance was created to help equip children for life in the digital world, including developing their understanding of appropriate online behaviour, being discerning consumers of online information, copyright issues and healthy use of technology. We place a strong emphasis on e-safety through yearly online safety units, regular retrieval of online safety knowledge in lessons, regular assemblies and communication with parents and carers at home. Our curriculum teaches children the knowledge, understanding and skills they need to balance the advantages offered by technology with a critical awareness of their own and other's online behaviour. We equip every child with effective strategies for staying safe and making a positive contribution online.

How we plan for and teach Computing

The Kapow scheme of work is designed around the three strands referenced in the National Curriculum: computer science, information technology and digital literacy.

Throughout KS1 and KS2, children revisit knowledge and skills in five key areas linked to these three strands: computer systems and networks; programming; creating media; data handling and online safety. The cyclical route through the curriculum ensures that prior knowledge and skills are revisited to ensure retention in long-term memory and built upon to develop increasingly sophisticated understanding.

Computing is taught weekly in every half-term of the year. Some lessons take place in our Computing Suite which is equipped with a range of Mac desktop computers. Other computing lessons take place in the base classroom with children accessing a range of devices such as Beebots, iPads or Google Chrome Books. Computing lessons at Springfield incorporate the following elements: retrieval practice; explicit teaching of new vocabulary; teacher modelling and questioning and a range of generative learning tasks - some independent and some undertaken in partnerships. Knowledge organisers for each unit support children to build a foundation of factual knowledge by encouraging recall of key facts and vocabulary.

Each unit of learning includes teacher videos to develop excellent subject knowledge and support teachers' ongoing professional development. All teachers at Springfield are robustly supported to have strong subject knowledge across the computing curriculum and to know how new learning builds on prior understanding and towards future knowledge and skills.

How we evaluate learning in Computing

Teachers continually evaluate children's learning through both formative and summative assessment opportunities. In each lesson, teachers ensure children are assessed against the learning objectives and planning is responsive to gaps and misconceptions. Each unit has a unit quiz to assess the retention of new knowledge and vocabulary.

The impact of our computing curriculum can clearly be seen in projects that children create as well as presentations created as digital content. Programs that children write code for are saved digitally and accessed by teachers to ensure achievement of learning objectives. Children have the opportunity to self-assess the content they have created, as well as peer-assess. In each year group, children use previously learned skills and apply them to new software and coding programs. Our pupils leave Springfield equipped with a range of knowledge and skills that enable them to succeed in their secondary education and be active participants in the digital world.

EYFS	
Nursery	**Reception**
At the heart of the Characteristics of Effective Learning in the EYFS lie curiosity, creativity and problem-solving. Our pedagogy supports children to develop these dispositions by interacting with the rich provision around them. In turn, these dispositions lay the foundation for their journey into computing. Children are also given opportunities, time and encouragement where needed, to explore how things work mechanically. This supports children to develop the computational and logical thinking they require for future learning in computer science. Pulleys, cogs, marble runs, jigsaw puzzles, lego and alternative building materials, water wheels and wind up toys are part of rotated provision in Nursery and allow children to experience cause and effect in its simplest form, as well as develop skills in design, logical reasoning, problem solving and sequencing in an 'unplugged' context.	In Reception children continue to explore this rich menu of 'unplugged' activities which support computational thinking. Further to this, Reception children learn the very basics within the three strands of Computing. In information technology, children take photographs to contribute to a shared story based around a character from a core text and to document the effects of the changing seasons they see in Forest School sessions. They also learn that information such as recipes or facts about animals can be found on the internet. In computer science, they use the Beebots to further their understanding of cause and effect within a computing context. Reception children start their digital literacy learning as they begin to join whole-school e-Safety assemblies in the second half of the year.

Year 1: Computing Curriculum Map

Unit	Online Safety	Computing Systems and Networks Improving Mouse Skills	Programming 1 Algorithms Unplugged	Skills Showcase Rocket to the Moon	Programming 2 Bee-Bots	Creating Media Digital Imagery	Data Handling Introduction to Data
Half-Term	Autumn 1	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Overview	Learning how to stay safe online and how to manage feelings and emotions when someone or something has upset us.	Learning how to login and navigate around a computer; developing mouse skills; learning how to drag, drop, click and control a cursor to create works of art	Algorithms, decomposition and debugging are made relatable to familiar contexts, following directions, learning why instructions need to be specific.	Developing keyboard and mouse skills through designing, building and testing. Creating a digital list of materials, using drawing software and recording data.	Introducing programming through the use of a Bee-Bot and exploring its functions.	Taking and editing photos, searching for and adding images to a project.	Learning what data is and the different ways it can be represented. Learning why data is useful and the ways it can be gathered and recorded.
Outcomes *By the end of the unit, children will be able to:*	Discuss what the internet is and how it can be used. Recognise that the internet may affect mood or emotions. Recognise how internet use can affect and upset other. Identify which information is appropriate to share and post online and which is not.	Use computers more purposefully. Log in and navigate around a computer. Drag, drop, click and control a cursor using a mouse. Use software tools to create art on the computer.	Explain what an algorithm is. Write clear algorithms. Follow an algorithm. Explain what inputs and outputs are. Create an achievable program. Decompose a design into steps. Identify bugs in an algorithm and how to fix them.	Use a computer to make a list Explain the benefits of making a list on the computer Use a basic range of tools on graphics editing software to design a rocket Sequence instructions Follow instructions to build their model rocket Input data about their rockets into a table or spreadsheet	Recognise cause and effect when pressing buttons on a Bee-Bot. Discuss and demonstrate how the Bee-Bot works. Record video ensuring everyone is in the shot. Give a a number of clear instructions in sequence. Program a Bee-Bot to reach a destination. Identify and correct mistakes in their programming.	Plan a pictorial story using photographic images in sequence. Explain how to take clear photos. Take photos using a device. Edit photos by cropping, filtering and resizing. Search for and import images from the internet. Explain what to do if something makes them uncomfortable online. Organise images on the page, orientating where necessary.	Represent animal-themed data in different ways, using objects and technology. Log in and use mouse and keyboard skills to navigate the computer. Represent the same data as a pictogram and a table or chart. Collect data about minibeasts using a tally chart and represent their data digitally. Click and drag objects to sort data using a branching database. Consider the types of input that would be used to gather different forms of data when designing an invention

Knowledge	To know that the internet is many devices connected to one another. To know what to do if you feel unsafe or worried online – tell a trusted adult. 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.	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 understand that an algorithm is when instructions are put in an exact order. To understand that decomposition means breaking a problem into manageable chunks and that it is important in computing. 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 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. To know that a spreadsheet is an electronic 'table' for sorting data.	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.	To understand that holding the camera or device 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.	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'.
Skills	Recognising devices that are connected to the internet. Understanding that we are connected to others when using the internet. Understanding some of the ways we can use the internet. 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. Understanding how to interact safely with others online. Recognising how actions on the internet can affect others.	Learning how to explore and tinker with hardware to find out how it works. Learning where keys are located on the keyboard. 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. Developing understanding of different software tools. Recognising devices that are connected to the internet. Logging in and out and saving work on their own account.	Recognising that some devices are input devices and others are output devices. Learning that decomposition means breaking a problem down into smaller parts. Using decomposition to solve unplugged challenges. Developing the skills associated with sequencing in unplugged activities. Following a basic set of instructions. Assembling instructions into a simple algorithm. Learning to debug instructions when things go wrong.	Learning where keys are located on the keyboard. Learning how to operate a camera to take photos and videos. Using logical reasoning to predict the behaviour of simple programs. Developing the skills associated with sequencing in unplugged activities. Following a basic set of instructions. Assembling instructions into a simple algorithm. Learning to debug instructions when things go wrong.	Learning how to explore and tinker with hardware to find out how it works. Learning how to operate a camera to take photos and videos. 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. Following a basic set of instructions. Assembling instructions into a simple algorithm.	Learning how to explore and tinker with hardware to find out how it works. Learning where keys are located on the keyboard. Learning how to operate a camera to take photos and videos. Developing the skills associated with sequencing in unplugged activities. Using a basic range of tools within graphic editing software. Taking and editing photographs. Developing control of the mouse through dragging, clicking and resizing of images to create different effects.	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. Developing control of the mouse through dragging, clicking and resizing of images to create different effects. Developing understanding of different software tools. Recognising devices that are connected to the internet. Understanding that technology can be used

	To be able to recognise what a digital footprint is and how to be careful about posting online.		Learning to debug an algorithm in an unplugged scenario.	Learning to debug an algorithm in an unplugged scenario. Using a basic range of tools within graphic editing software. Taking and editing photographs. Developing control of the mouse through dragging, clicking and resizing of images to create different effects. Developing understanding of different software tools. Recognising devices that are connected to the internet. Understanding that technology can be used to represent data in different ways: pictograms, tables, pie charts, bar charts, block graphs etc. Logging in and out and saving work on their own account.	Programming a floor robot to follow a planned route. Learning to debug instructions when things go wrong. Using programming language to explain how a floor robot works. Learning to debug an algorithm in an unplugged scenario. Taking and editing photographs.	Developing understanding of different software tools. Searching and downloading images from the internet safely. 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.	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.
Vocabulary	Communicate Connect Connection Consoles Devices Digital footprint Emotion Feelings Instructions Internet Internet safety Laptop Mood Online Personal nformation Phone Posting Respect Sharing Smartphone Smart TV Smartwatch Strangers	Log in Login Log out / off Mouse Mouse pointer Keyboard Screen Password Account Software Duplicate Ctrl Tools Right click Menu Layers Username Drag/ Drop Digital photograph Undo Cursor	Algorithm Automatic Bug Chunks Clear Code Debug Decompose Decomposition Device Directions Input Instructions Manageable Motion Order Organise Output Precise Programming Problem Robot Sensor	Annotate Cells Components Create Data Debug Designing Digital content Digital image Document E-document Edit Editing program Evaluate Folder Input Instructions Log in Photo Program Order Robot Save	Algorithm Artificial intelligence Bee-Bot Clear Code Debug Demonstration Filming Inputting Instructions Pause Precise Predict Program Tinker Video Video recording	Background Blurred Camera Clear Crop Delete Device Digital camera Download Drag and drop Edit Editing software Filter Image Import Internet Keyword Online Photograph Resize Save as Screen Search engine	Bar chart Block graph Branching database Categorise Chart Click and drag Compare Count Data Data collection Data record Data representation Edit Input Keyboard Line graph Mouse Information Label Pictogram Pie chart Process Record

	Tablet Trust Wired Wireless		Sequence Solution Specific Steps Tasks Virtual assistant	Sequence Share Software Spreadsheet Table		Sequence Software Storage space Visual effects	Resize Sort Table Tally Values

Year 2: Computing Curriculum Map

Unit	Online Safety	Computing systems and networks 1: What is a computer?	Programming 1: Algorithms and debugging	Computing systems and networks 2: Word processing	Programming 2 : Scratch Jr	Creating media: Stop motion	Data handling: International Space Station
Half-Term	Autumn 1	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Overview	Learning: how to keep information safe and private online; who we should ask before sharing things online and how to give, or deny permission online.	Exploring what a computer is by identifying how inputs and outputs work and how computers are used in the wider world to design their own computerised invention.	Developing an understanding of; what algorithms are, how to program them and how they can be developed to be more efficient, introduction of loops.	Developing touch typing skills, learning keyboard shortcuts and simple editing tools.	Exploring what 'blocks' do' by carrying out an informative cycle of predict > test > review. Programming a familiar story and making a musical instrument.	Learning how to create simple animations from storyboarding creative ideas.	Learning how data is collected, used and displayed and the scientific learning of the conditions needed for plants and humans to survive.
Outcomes	Explain what is meant by online information. Recognise what information is safe to be shared online. Explain why we need passwords and what makes a strong password. Understand that they need to ask permission before sharing content online and explain why. Understand that they have the right to deny their permission to information about them being shared online. Say who they can ask for help with online worries.	Name some computer peripherals and their function. Recognise that buttons cause effects. Explain that technology follows instructions. Recognise different forms of technology. Design an invention which includes inputs and outputs. Explain the role of computers in the world around them.	Decompose a game to predict the algorithms. Give a definition for 'decomposition'. Write clear and precise algorithms. Create algorithms to solve problems. Use loops in their algorithms to make their code more efficient. Explain what abstraction is.	Explain which are the home row keys and how to find them for typing. Use the spacebar and backspace correctly. Type and make simple alterations to text using buttons on a word processor. Search for, import and alter appropriate images for a text document. Modify text in a document. Use copy and paste to copy text from one document to another. Explain what information is safe to be shared online.	Explore a new application independently. Explain what the blocks on ScratchJr do and use them for a purpose. Recognise a loop in coding and why it is useful. Use a code to create an animation of an animal moving. Use code to follow and create an algorithm. Program code to run 'on tap'. Explain the role of the blocks in a program they have created.	Create a flip book animation. Decompose a story into smaller parts to plan a stop motion animation. Create stop motion animations with small changes between images.	Describe and explain how astronauts' survival needs are met aboard the ISS. Identify and digitally draw items which fulfil basic human needs when aboard the ISS. Read the correct temperature on a thermometer. Design a display showing everything that needs to be monitored by sensors on the ISS. Create an algorithm that addresses all plants' needs. Explain how space exploration can benefit life on Earth.

	Use some strategies to work out if online information is reliable or not.						Read data to identify whether a planet might be habitable.
Knowledge	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.	o know the difference between a desktop and laptop computer. To know that people control technology. To know some input devices that give a computer an instruction about what to do (output). To know that computers often work together.	To understand what machine learning is and how it 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 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.	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.	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.	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.

Skills							
	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.	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. Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts. Using word processing software to type and reformat text. Creating and labelling images. Learning how computers are used in the wider world	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. Following 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. Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts.	Developing confidence with the keyboard and the basics of touch typing. Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts. Using word processing software to type and reformat text. Searching for appropriate images to use in a document. Understanding what online information is. Identifying whether information is safe or unsafe to be shared online.	Recognising that buttons cause effects and that technology follows instruction Explaining what an algorithm is. Following 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. Using software (and unplugged means) to create story animations.	Using greater control when taking photos with cameras, tablets or computers. Using logical thinking to explore software, predicting, testing and explaining what it does.	Developing confidence with the keyboard and the basics of touch typing. 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.
Vocabulary	Accept Comment Consent Content Deny Emojis Offline Online Password Permission	Battery Buttons Camera Computer Desktop Device Digital Digital recorder Electricity Function	Abstraction Algorithm Artificial intelligence Bug Clear Correct Data Debug Decompose Error	Copy Copyright Cut Delete Forward button Highlight Home row Home screen Image Import	Algorithm Animation Blocks Bug Button CGI Computer code Code Debug Fluid	Animation Background Decompose Digital device Drawing Flipbook Frames Moving images Object Onion skinning	Algorithm Astronaut Data Digital Digital content Experiment Galaxy Insulation Interactive map

	Personal information	Input	Key features	Italics	Icon	Plan	International Space Centre
	Pop ups	Invention	Loop	Keyboard	Imitate	Still images	International Space Station
	Pressure	Keyboard	Predict	Keyboard character	Instructions		Interpret
	Private information	Laptop	Unnecessary	Keyboard shortcut	Loop		Laboratory
	Reliable	Monitor		Keyword	'On tap'		Monitor
	Share	Mouse		Layout	Programming		Planet
	Terms and conditions	Output		Navigate	Repeat		Satellite
	Trusted adult	Paying till		Paste	ScratchJR		Sensor
		Scanner		Redo	Sequence		Space
		Screen		Search	Sound recording		Temperature
		System		Space bar			Thermometer
		Tablet		Text			Water reservoir
		Technology		Text effects			
		Video		Touch typing			
		Wires		Underline			
				Undo			
				Word processing			

Year 3: Computing Curriculum Map

Unit	Online Safety	Computing systems and networks 1: Networks and the internet	Programming: Scratch	Computing systems and networks 2: Emailing	Computing systems and networks 3: Journey inside a computer	Creating media: Video trailers	Data handling: Comparison cards databases
Half-Term	Autumn 1	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Overview	Learning: the difference between fact, opinion and belief; and how to deal with upsetting online content. Knowing how to protect personal information online.	Learning what a network and how devices communicate and share information.	Exploring the programme Scratch, following the predict > test > review cycle. Learning about 'loops' and programming an animation, story and game.	Sending emails with attachments and understanding what cyberbullying is.	Assuming the role of computer parts and creating paper versions of computers to consolidate understanding of how a computer works.	Developing digital video skills to create trailers, with special effects and transitions.	Learning about records, fields and data and sorting and filtering data.
Outcomes	Differentiate between fact, opinion and belief online. Explain how to deal with upsetting online content. Recognise that digital devices communicate with each other to share personal information. Explain what social media platforms are used for. Recognise why social media platforms are age-restricted.	Recognise that a network is two or more devices connected. Explain how information moves around a network and the role of the server. Understand that networks connect to the internet via a router. Explain some of the journey a website goes through to reach your computer. Explain that websites are split into small pieces (packets) to be sent via the internet.	Explain what some of the blocks do in Scratch. Explain what a loop is and include one in their program. Suggest possible additions to an existing program. Recognise where something on screen is controlled by code. Use a systematic approach to find bugs. Explain what an algorithm is and its purpose.	Log in and out of email. Send a simple email with a subject plus 'To' and 'From' in the body of the text. Edit an email. Type in the email address correctly and send the email. Add an attachment to an email. Write an email using positive language, with an awareness of how it will make the recipient feel. Recognise unkind behaviour online and know how to report it. Offer advice to victims of cyberbullying.	Recognise inputs and outputs and that the computer sends and receives information. Explain that the parts of a laptop work together and the purpose of each part. Explain what an algorithm is. Suggest what memory is for inside a computer. Make comparisons between different types of computer.	Describe the purpose of a trailer. Create a storyboard for a book trailer. Consider camera angles when taking photos or videos. Import videos and photos into film editing software. Record sounds and add these to a video. Add text to a video. Incorporate transitions between images. Evaluate their own and others' trailers.	Explain what is meant by 'field,' 'record,' and 'data.' Compare paper and computerised databases. Put values into a spreadsheet. Sort, filter and interpret data in a spreadsheet. Create a graph on Google Sheets. Explain the purpose of visual representations of data.

				Recognise when an email may be fake and explain how they know.			
Knowledge	o 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, such as your name, age, gender etc. To know what social media is and that age restrictions apply.	To understand what a network is and how a school network might be organised. To know that a server is central to a network and responds to requests made. To know that a router connects us to the internet. To know how the internet uses networks to share files. To know what a packet is and why it is important for website data transfer.	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.	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 that cyberbullying is bullying using electronics such as a computer or phone.	To know the roles that inputs and outputs play on computers. To know what some of the different components inside a computer are e.g. CPU, RAM, hard drive, and how they work together. To know what a tablet is and how it is different from a laptop/desktop computer.	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.	To know that a database is a collection of data stored in a logical, structured and orderly manner. 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.
Skills	Recognising how social media platforms are used to interact. 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.	Learning about the purpose of routers. 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. Learning how data is transferred.	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	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. Understanding the purpose of emails. Learning about cyberbullying. Learning that not all emails are genuine, recognising when an email might be fake and what to do about it.	Understanding what the different components of a computer do and how they work together. Drawing comparisons across different types of computers. Using decomposition to explain the parts of a laptop computer. Explaining the purpose of an algorithm	Using logical thinking to explore more complex software; predicting, testing and explaining what it does. Taking photographs and recording video to tell a story. Using software to edit and enhance their video adding music, sounds and text on screen with transitions.	Using logical thinking to explore more complex software; predicting, testing and explaining what it does. Understanding the vocabulary associated with databases: field, record, data. Learning about the pros and cons of digital versus paper databases. Sorting and filtering databases to easily retrieve information. Creating and interpreting charts and graphs to understand data.

			debug their own and others' code.				
Vocabulary	Accurate Age-restricted Autocomplete Beliefs Block Content Digital devices Fact Fake news Internet Opinion Password Persuasive Privacy settings Reliable Report Requests Search engine Security questions Sharing Smart devices Social media platforms Social networking Wellbeing	Cables Component Connection Corrupted Data Desktop Device DSL Fibre File Internet Laptop Network Network map Network switch Packets Radio waves Router Server Submarine cables Tablet Text map The Cloud Web server Website Website trackers WiFi Wired Wireless Wireless Access Points World Wide Web	Application Code Code block Coding application Debug Decompose Interface Game Loop Predict Program Remixing code Repetition code Review Scratch Sprite Tinker	Attachment Bcc (Blind carbon copy) Cc (Carbon copy) Compose Content Cyberbullying Document Domain Download Email Email account Email address Emoji Emotions Fake Font Genuine Hacker Icons Inbox Information Link Log in Log out Negative language Password Personal information Positive language Reply Responsible digital citizen Scammer Settings Send Sign in Spam email Subject bar Theme Tone Username Virus WiFi	Algorithm Assemble CPU (central processing unit) Data Decompose Desktop Disassemble GPU (graphics processing unit) Hard drive HDD (hard disk drive) Infinite loop Input Keyboard Laptop Memory Microphone Monitor Mouse Output Photocopier Program QR Code RAM (random access memory) ROM (read only memory) Storage Tablet device Technology Touchscreen Touchpad	Application Camera angle Clip Cross blur Cross fade Cross zoom Desktop Digital device Dip to black Directional wipe Edit Film Film editing software Graphics Import Key events Laptop Music Photo Plan Recording Sound effects Storyboard Time code Trailer Transition Video Voiceover	Categorise Category Chart Data Database Excel Fields Filter Graph Information Interpret PDF Questionnaire Record Representation Sort Spreadsheet

Year 4: Computing Curriculum Map

Unit	Online Safety	Computing systems and networks: Collaborative learning	Programming: Further Coding with Scratch	Computing Systems and Networks: Website design	Skills showcase: HTML	Creating Media Computational Thinking	Data handling: Investigating weather
Half-Term	Autumn 1	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Overview	Searching for information and making a judgement about the probable accuracy; recognising adverts and pop-ups; understanding that technology can be distracting	Learning how to work collaboratively and exploring a range of collaborative tools.	Revisiting the key features and beginning to use 'variables' in code scripts.	Learning how web pages and sites are created and how to embed media and links.	Learning about the markup language behind a webpage; becoming familiar with HTML tags, changing HTML and CSS code to alter images and 'remix' a live website.	Solving problems effectively using the four areas of abstraction, algorithm design, decomposition and pattern recognition.	Researching and storing data on spreadsheets and designing a weather station.
Outcomes	Describe how to search over multiple platforms and are aware of the accuracy of the results presented. Describe some of the methods used to persuade people to buy online. Explain the difference between fact, opinion and belief and recognise these online. Explain what a bot is and give examples of different bots. Explain some positive and negative distractions of using technology and small strategies on how to reduce the amount of time spent on technology.	Understand the need to be thoughtful when working on a collaborative document. Use comments to suggest changes to a document and understand how to resolve comments. Use a variety of different slide styles to convey information including images and transitions. Create a Google Form with a range of different questions types that will provide different types of answers, e.g. text, multiple choice or numerical values.	Understand how to create a simple script in Scratch – be able to change sprite and prevent the sprite from rotating. Use decomposition to identify key features and understand how to decipher actions that make the quiz game work. Understand what a variable is and how to use the 'say' and 'ask' blocks. Create a variable and be able to use a variable to record a score. Understand what a variable is and how it works within a program.	Use most of the tabs (e.g. insert, pages, themes) on Google Sites on their website. Create a clear plan for their web page and begin to create it. Create a professional looking web page with useful information and a clear style, which is easy for the user to read and find information from. Create a clear plan by referring back to their checklist. Create four web pages with a range of features on their website.	Add text between the heading and paragraph tags. Easily activate the goggles to investigate a web page. Explain how they altered the HTML to create their own posters. Change the colours and sizes of their object elements. Explain how they created their story. Adapt the basic elements of a story within a web page using the 'Inspect Elements' tool. Change an image within a web page and create their own news story, replacing the text	Understand that problems can be solved more easily using computational thinking. Understand what the different code blocks do and create a simple game. Understand the terms 'pattern recognition' and 'abstraction' and how they help to solve a problem. Create a Scratch program which draws a square and at least one other shape. Understand how computational thinking can help to solve problems and apply computational thinking to problems they face.	Search the web efficiently to find temperatures of different cities and record this accurately. Design a weather station that gathers and records sensor data, explaining how it works and the units of measurement it would use. Design an automated machine that uses selection to respond to sensor data. Search for and record weather forecast information in a spreadsheet and explain how this data is collected.

		Export data to a spreadsheet, highlighting data, using conditional formatting and calculating averages and sums of numbers.			and images of a webpage.		Create a video which includes weather forecast information.
Knowledge	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.	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.	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 a website is a collection of pages that are all connected. To know that websites usually have a homepage and subpages as well as clickable links to new pages, called hyperlinks. To know that websites should be informative and interactive.	To understand and identify examples of HTML tags. To understand what changing the HTML and CSS does to alter the appearance of an object on the web. To understand that copyright means that those images are protected and to understand that we should do a "creative commons" image search if we wish to use images from the internet. To know what "fake news" is and ways to spot websites that carry this type of misinformation. To know what the "inspect" elements tool is and ways of using it to explore and alter text and images.	To know that combining computational thinking skills 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 that computers can use different forms of input to sense the world around them so that they can record and respond to data ('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.
Skills	Understanding why some results come before others when searching. Understanding that information found by searching the internet is not all grounded in fact. Learning to make judgements about the	Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration. Use online software for documents, presentations, forms and spreadsheets.	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.	Building a web page and creating content for it. Designing and creating a webpage for a given purpose. Using software to work collaboratively with others.	Remixing existing code. Building a web page and creating content for it. Understanding that information found by searching the internet is not all grounded in fact. Recognising that information on the Internet might not be	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 tablets or digital cameras to film a weather forecast. Understanding that weather stations use sensors to gather and record data that predicts the weather. Using keywords to effectively search for information on the internet.

	accuracy of online searches. Identifying forms of advertising 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 that some sources are more trustworthy than others	Using software to work collaboratively with others. Understanding that software can be used collaboratively online to work as a team. Recognising what appropriate behaviour is when collaborating with others online.	Incorporating variables to make code more efficient. Remixing existing code.		true or correct and that some sources are more trustworthy than others.	Using past experiences to help solve new problems. Using abstraction to identify the important parts when completing both plugged and unplugged activities. Creating algorithms for a specific purpose. Using abstraction and pattern recognition to modify code.	Searching the internet for data. Designing a device that gathers and records sensor data. 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.
Vocabulary	Accuracy Advantages Advertisements Belief Bot Chatbot Computer Distractions Fact Hashtag Implications In-app purchases Influencer Opinion Program Recommendations Reliable Risks Screen time Search results Snippets Sponsored Trustworthy	Animations Average Bar chart Collaboration Comment Contribution Data Edited Email account Format Freeze Icon Images Insert Link Multiple choice Numerical data Pie chart Presentations Resolved Reviewing comments Share Slides Software Spreadsheets Suggestions Survey Teamwork Themes Transitions	Broadcast block Code blocks Conditional Coordinates Decomposition Features Game Information Negative numbers Orientation Parameters Position Program Project Script Sprite Stage Tinker Variables	Assessment Audience Checklist Collaboration Content Contribution Create Design Embed Evaluate Features Google SItes Hobby Homepage Hyperlinks Images Insert Online Plan Progress Published Record Review Style Subpage Tab Theme Web page Website World Wide Web	Code Component Content Copyright CSS End tag Fake news Hacking Heading Headline Hex code HTML Input Internet browser Output Paragraph Permission Remixing Script Start tag Tags Text URL Webpage	Abstraction Algorithm Code Computational thinking Decomposition Input Logical reasoning Output Pattern recognition Script Sequence Variable	Accurate Backdrop Climate zone Cold Collaboration Condensation Cylinder Degrees Evaporation Extreme weather Forecast Heat sensor Lightning Measurement Pinwheel Presenter Rain Satellite Script Sensitive Sensor data Solar panel Tablet/Digital camera Temperature Thermometer Tornado Warm Weather Weather forecast Wind

Year 5: Computing Curriculum Map

Unit	Online Safety	Computing systems and networks: Search engines	Programming 1: Music	Data handling: Mars Rover 1	Programming 2: Micro:bit	Creating media: Stop motion	Skills showcase: Mars Rover 2
Half-Term	Autumn 1	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Overview	Learning about app permissions; the positive and negative aspects of online communication; that online information is not always factual; how to deal with online bullying and managing our health and wellbeing.	Learning about how page rank works and how to identify inaccurate information.	Building-on programming and music skills to create different sounds, beats and melodies which are put to the test with a Battle of the Bands performance!	Learning about the Mars Rover, exploring how and why it transfers data including instructions, and how messages can be sent using binary code.	Creating algorithms and programs that are used in the real world. Using the 'predict, test and evaluate' cycle to create and debug programs with specific aims.	Creating animations, storyboard ideas and decomposing a story into small parts before putting it together to create the illusion of a moving image.	Exploring how the Mars rover: moves, follows instructions, collects and sends data; understanding how computers work, what data is and how it is transferred.
Outcomes	Understand that passwords need to be strong and that apps require some form of passwords. Recognise a couple of the different types of online communication and know who to go to if they need help with any communication matters online. Search for simple information about a person, such as their birthday or key life moments. Know what bullying is and that it can occur both online and in the real world.	Explain what a search engine is, suggesting several search engines to use and explain how to use them to find websites and information. Suggest that things online aren't always true and recognise what to check for. Explain why keywords are important and what TASK stands for, using these strategies to search effectively. Recognise the terms 'copyright' and 'fair use' and combine text and images in a poster.	Iterate ideas, testing and changing throughout the lesson. Explain what the basic commands do: 'play', 'sleep', '2.times do'. Explain how their program links to the theme. Include a loop in their work. Correct their own simple mistakes. Explain their scene in the story. Link musical concepts to their scene. Include a live loop and explain its function. Use samples effectively to enhance music.	Identify some of the types of data that the Mars Rover could collect (for example, photos). Explain how the Mars Rover transmits the data back to Earth and the challenges involved in this. Read any number in binary, up to eight bits. Identify input, processing and output on the Mars Rovers. Read binary numbers and grasp the concept of binary addition. Relate binary signals (Boolean) to a simple	Clip blocks together and predict what will happen. Make connections with previous programming interfaces they've used, e.g. Scratch. Create their own images to make the animation and recognise the difference between 'on start' and 'forever'. Recognise blocks they've used previously, identifying inputs and outputs used and make predictions about how variables work.	Create a toy with simple images with a single movement. Create a short stop motion with small changes between images. Think of a simple story idea for their animation then decompose it into smaller parts to create a storyboard with simple characters. Make small changes to the models to ensure a smooth animation and delete unnecessary frames.	Create a pixel picture, explaining that a pixel is the smallest element of a digital image and that binary is used to code and transfer this data. Save a JPEG as a bitmap and recognise the difference in file size as well as explaining how pixels are used to transfer image data. Explain the 'fetch, decode, execute' cycle in relation to real-world situations. Create a profile with a safe and suitable username and

	Recognise when health and wellbeing are being affected in either a positive or negative way through online use. Offer a couple of advice tips to combat the negative effects of online use.	Make parallels between book searching and internet searching, explaining the role of web crawlers and recognising that results are rated to decide rank.	Code a piece of music that combines a variety of structures. Use loops in their programming. Recognise that programming music is a way to apply their skills.	character-based language, ASCII.	Choose appropriate blocks to complete the program and attempt the challenges independently. Break a program down into smaller steps, suggesting appropriate blocks and match the algorithm to the program.	Add effects such as extending parts and titles. Provide helpful feedback to other groups about their animations.	password and begin to use 3D design tools. Independently take tutorial lessons, applying what they have learnt to their design and understand the importance of using an online community responsibly.
Knowledge	Identifying possible dangers online and learning how to stay safe. 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.	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 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 music while performing.	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.	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 decomposition of an idea is important when creating stop-motion animations. To understand that stop motion animation is an animation filmed one frame at a time using models, and with tiny changes between each photograph. To know that editing is an important feature of making and improving a stop motion animation.	To understand that bit patterns represent images as pixels. To understand that the data for digital images can be compressed. To know the difference between ROM and RAM. To understand various techniques that will improve the design of a 3D object (using CAD software).
Skills	Understand that passwords need to be strong and that apps require some form of passwords. Recognise a couple of the different types of online communication and know who to go to if they need help with any communication matters online. Search for simple information about a	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	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.	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	Decomposing a program without support. Predicting how software will work based on previous experience. Writing more complex algorithms for a purpose. Programming an animation. Iterating and developing their	Decomposing animations into a series of images. Decomposing a story to be able to plan a program to tell a story. Using video editing software to animate.	Learning the difference between ROM and RAM. Recognising how the size of RAM affects the processing of data. Understanding the fetch, decode, execute cycle. Learning how the data for digital images can be compressed. Recognising that computers transfer

	person, such as their birthday or key life moments. Know what bullying is and that it can occur both online and in the real world. Recognise when health and wellbeing are being affected in either a positive or negative way through online use. Offer a couple of advice tips to combat the negative effects of online use.	have developed with the use of technology. Recognising that information on the Internet might not be true or correct and learning ways of checking validity.	Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected. Writing code to create a desired effect. Using a range of programming commands. Using repetition within a program. Amending code within a live scenario. Using logical thinking to explore software more independently, making predictions based on their previous experience. Using a software programme (Sonic Pi) to create music. Identify ways to improve and edit programs, videos, images etc.	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. 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 with the use of technology.	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. Writing code to create a desired effect. Using a range of programming commands. Using repetition within a program. Using logical thinking to explore software more independently, making predictions based on their previous experience. Identify ways to improve and edit programs, videos, images etc.		data in binary and understanding simple binary addition. Understanding how bit patterns represent images as pixels. Using logical thinking to explore software more independently, making predictions based on their previous experience. Independently learning how to use 3D design software package TinkerCAD. Learn about different forms of communication that have developed with the use of technology.
Vocabulary	Accurate information Advice App permissions Application Apps Bullying Communication Emojis Health In-app purchases Information Judgement Memes Mental health Mindfulness Mini-biography Online communication Opinion Organisation Password	Algorithm Appropriate Copyright Correct Credit Data leak Deceive Fair Fake Inappropriate Incorrect Index Information Keywords Network Privacy Rank Real Search engine TASK	Beat Buffer Bugs Coding Commands Debug Decompose Error Format Instructions Live loops Loop Melody Mindmap Music Output Performance Pitch Play Predict	8-bit binary Addition ASCII Binary code Boolean Byte Communicate Construction CPU Data transmission Decimal numbers Design Discovery Distance Hexadecimal Input Instructions Internet Mars Rover Moon	Algorithm Animation App Blocks Bluetooth Code block Connection Create Debug Decompose Designing Desktop Device Download Images Input Instructions Laptop Load Loop	Animation Animator Background Character Decomposition Design Digital device Edit Evaluate Flip book Fluid movement Frames Model Moving images Onion skinning Still images Stop motion Storyboard Thaumatrope Zoetrope	3D Algorithm Binary image CAD Compression CPU Data Drag and drop Fetch, decode, execute ID card Input JPEG Memory Online community Operating system Output Pixels RAM Responsible RGB

	Personal information Positive contributions Private information Real world Strong password Summarise Support Technology Trusted adult Wellbeing	Web crawler Website	Programming Rehearsal Repetition Rhythm Sleep Sonic Pi Soundtrack Spacing Tempo Timbre Tinker Tutorials Typing Typo	Numerical data Output Planet Radio signal RAM Research Scientist Sequence Signal Simulation Space Subtraction Technology Transmit	Micro:bit Outputs Pairing Pedometer Polling Predict Program Repetition Reset Sabotage Scoreboard Screen Systematic Tablet Tinkering USB Variables Wifi Wireless Wires		ROM Safe

Year 6: Computing Curriculum Map

Unit	Online Safety	Computing systems and networks: Bletchley Park	Programming: Intro to Python	Data handling 1: Big Data 1	Creating Media History of Computers	Data handling 2: Big Data 2	Skills showcase: Inventing a product
Half-Term	Autumn 1	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Overview	Learning to deal with issues online; about the impact and consequences of sharing information online; how to develop a positive online reputation; combating and dealing with online bullying and protective passwords.	Discovering the history of Bletchley and learning about code breaking and password hacking. Demonstrating digital literacy skills by creating presentations.	Using the programming language 'Python' to create designs and art. Learning how to create loops and nested loops to make their code more efficient.	Identifying how barcodes and QR codes work. Learning how infrared waves are used for the transmission of data while recognising the uses of RFID.	Writing, recording and editing radio plays set during WWII, learning about how computers have evolved.	Further developing understanding of how networks and the Internet are able to share information. Learning how big data can be used to design smart buildings.	Designing a product, pupils: evaluate, adapt and debug code to make it suitable for their needs and designing products in CAD and creating a website and video.
Outcomes	Discuss a range of issues online that can leave pupils feeling sad, frightened, worried or uncomfortable and can describe numerous ways to get help. Explain how sharing online can have both positive and negative impacts. Be aware of how to seek consent from others before sharing material online and can describe how content can still be shared online even if it is set to private. Explain what a 'digital reputation' is and what it can consist of. Understand the importance of capturing evidence of online	Explain that codes can be used for a number of different reasons and decode messages. Explain how to ensure a password is secure and how this works. Create a simple poster with information about Bletchley Park including the need to build electronic thinking machines to solve cipher codes. Explain the importance of historical figures and their contribution towards computer science. Present information about their historical figure in an interesting and engaging manner.	Iterate ideas, testing and changing throughout the lesson and explain what their program does. Use nested loops in their designs, explaining why they need two repeats. Alter the house drawing using Python commands; use comments to show a level of understanding around what their code does. Use loops in Python and explain what the parts of a loop do. Recognise that computers can choose random numbers; decompose the program into an algorithm and	Create (and scan) their own QR code using a QR code generator website. Explain how infrared can be used to transmit a Boolean type signal. Explain how RFID works, recall a use of RFID chips, and type formulas into spreadsheets. Take real-time data and enter it effectively into a spreadsheet. Presenting the data collected as an answer to a question. Recognising the value of analysing real-time data. Analyse and evaluate transport data and consider how this provides a useful service to commuters.	Explain how to record sounds and add in sound effects over the top. Produce a simple radio play with some special effects and simple edits which demonstrate an understanding of how to use the software. Create a document that includes correct date information and facts about the computers and how they made a difference. Demonstrate a clear understanding of their device and how it affected modern	Recognise that data can become corrupted within a network and that data sent in packets is more robust, as well as identify the need to update devices and software. Recognise differences between mobile data and WiFi and use a spreadsheet to compare and identify high-use data activities and low-use data activities. Make links between the Internet of Things and Big Data and give a basic example of how data analysis/analytics can lead to improvement in town planning. Explain ways that Big Data or IoT principles	Evaluate code, understand what it does and adapt existing code for a specific purpose. Debug programs and make them more efficient using sequence, selection, repetition or variables. Design appropriate housing for their product using CAD software, including any input or output devices needed to make it work. Create an appealing website for their product, aimed at their target audience which explains what their product is and what it does, using persuasive language.

	bullying and can demonstrate some of these methods on the devices used at school. Describe ways to manage passwords and strategies to add extra security such as two-factor authentication. Explain what to do if passwords are shared, lost, or stolen. Describe strategies to identify scams. Explain ways to increase their privacy settings and understand why it is important to keep their software updated.		modify a program to personalise it.		computers, including well-researched information with an understanding of the reliability of their sources. Describe all of the features that we'd expect a computer to have including RAM, ROM, hard drive and processor, but of a higher specification than currently available.	could be used to solve a problem or improve efficiency within the school and prepare a presentation about their idea, considering the privacy of some data. Present their ideas about how Big Data/IoT can improve the school and provide feedback to others on their presentations.	Create an edited video of their project, articulating the key benefits. Describe and show how to search for information online and be aware of the accuracy of the results presented.
Knowledge	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.	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 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.	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 radio plays are plays where the audience can only hear the action so sound effects are important. To know that sound clips can be recorded using sound recording software. To know that sound clips can be edited and trimmed.	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.	To know what designing an electronic product involves. To know which programming software/language is best to achieve a purpose. To know the building blocks of computational thinking e.g. sequence, selection, repetition, variables and inputs and outputs.

Skills							
	Learning about the positive and negative impacts of sharing online. 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. Recognising that updated software can help to prevent data corruption and hacking.	Learning about the history of computers and how they have evolved over time. 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. Using search and word processing skills to create a presentation. Understanding how search engines work. Understanding the importance of secure passwords and how to create them. Using search engines safely and effectively.	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. Using logical thinking to explore software independently, iterating ideas and testing continuously.	Understanding and identifying barcodes, QR codes and RFID. Identifying devices and applications that can scan or read barcodes, QR codes and RFID. Understanding how barcodes, QR codes and RFID work. Gathering and analysing data in real time. Creating formulas and sorting data within spreadsheets. Learning how 'big data' can be used to solve a problem or improve efficiency.	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 search and word processing skills to create a presentation. Planning, recording and editing a radio play. Creating and editing sound recordings for a specific purpose.	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. Using search and word processing skills to create a presentation. Creating formulas and sorting data within spreadsheets. 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.	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. Using logical thinking to explore software independently, iterating ideas and testing continuously. Creating and editing videos, adding multiple elements: music, voiceover, sound, text and transitions. Using design software TinkerCAD to design a product. Creating a website with embedded links and multiple pages. Understanding how search engines work. Using search engines safely and effectively.
Vocabulary	Anonymity Antivirus Biometrics Block and report Consent Copy Digital footprint Digital personality Financial information	Acrostic Code Brute force hacking Caesar cipher Chip and pin system Cipher Code Combination Contribute Convince	Algorithm Code Command Design Import Indentation Input Instructions Loop	Algorithms Barcode Binary Boolean Brand Chips Commuter Contactless Data	Background noise Byte Computer Devices File FX Gigabyte Graphics Hard drive	Big Data Bluetooth Corrupted Data Energy GPS Improve Infrared Internet of Things	Adapt Advert Algorithm Bugs Coding Debugging Design Edit Electronic

	Hacking	Date shift cipher	Output	Encrypted	Hardware	Personal	Evaluate
	Inappropriate	Discovery	Patterns	Infrared	Kilobytes	Privacy	Facts
	Malware	Hero	Random	MagicBand	Megabyte	QR codes	Image rights
	Online bullying	Invention	Remix	Privacy	Memory storage	Revolution	Images
	Online reputation	Nth Letter Cipher	Repeat	Proximity	Mouse	RFID	Influence
	Password	Password	Shape	QR code	Operating system	SIM	Information
	Paste	Pig Latin		QR scanner	Overlay	Simulation	Inputs
	Personal information	Pigpen cipher		Radio waves	Play	Smart city	Loops
	Personality	Present		RFID	Processor	Smart school	Manipulation
	Phishing	Scrambled		Signal	Radio play	Stop motion	Opinions
	Privacy settings	Secret		Systems/data analyst	RAM	Threat	Output
	Private	Secure		Transmission	Raspberry Pi	WiFi	Photos
	Reliable source	Technological advancement		Wireless	Record	Wireless	Product
	Report	Trial and error			Reverb		Program
	Reputation				ROM		Repetition
	Respect				Script		Screenshot
	Scammers				Smartphone		Search engine
	Screengrab				Sound		Selection
	Secure				Sound effects		Sequence
	Settings				Terabytes		Snippets
	Software updates				Touch screen		Software
	Two factor authentication				Track		Structures
	URL				Trackpad		Variables
	Username				Trailer		Video
							Website