



Albert Bradbeer Primary Academy

Computing Curriculum



Intention: To allow children to be immersed in unfamiliar worlds that demonstrate diversity and commonality across both time and space allowing the children to make sense of their own lived experiences and the wider world in which they inhabit. All children will be able to delve into the richness of the past with a secure grasp of key knowledge, which will allow them to pursue complex historical enquiry.

Overview

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2	Online Safety
E Y F S	Set up continuous provision in your classroom: Computing through continuous provision	Computing systems and networks Using a computer https://www.kapowprimary.com/subjects/computing/eyfs/eyfs-years/using-a-computer/	Programming 1 All about instructions https://www.kapowprimary.com/subjects/computing/eyfs/eyfs-years/all-about-instructions/	Computing systems and networks Exploring hardware https://www.kapowprimary.com/subjects/computing/eyfs/eyfs-years/exploring-hardware/	Programming 2 Programming Bee-Bots https://www.kapowprimary.com/subjects/computing/eyfs/eyfs-years/programming-bee-bots/	Data Handling Introduction to data https://www.kapowprimary.com/subjects/computing/eyfs/eyfs-years/introduction-to-data/	
Y e a r 1	Computing systems and networks Improving mouse skills https://www.kapowprimary.com/subjects/computing/key-stage-1/year-1/improving-mouse-skills/	Programming 1 Algorithms unplugged https://www.kapowprimary.com/subjects/computing/key-stage-1/year-1/algorithms-unplugged/	Skills showcase Rocket to the moon https://www.kapowprimary.com/subjects/computing/key-stage-1/year-1/rocket-to-the-moon/	Programming 2 Option 1: Bee-Bots https://www.kapowprimary.com/subjects/computing/key-stage-1/year-1/programming/programming-beebot/	Creating media Digital Imagery https://www.kapowprimary.com/subjects/computing/key-stage-1/year-1/creating-media-digital-imagery/	Data Handling Introduction to data https://www.kapowprimary.com/subjects/computing/key-stage-1/year-1/introduction-to-data/	Online Safety Y1 https://www.kapowprimary.com/subjects/computing/key-stage-1/year-1/year-1-online-safety/
Y e a r 2	Computing systems and networks 1 What is a computer? https://www.kapowprimary.com/subjects/computing/key-stage-1/year-2/what-is-a-computer/	Programming 1 Algorithms and debugging https://www.kapowprimary.com/subjects/computing/key-stage-1/year-2/algorithms-and-debugging/	Computing systems and networks 2 Word processing https://www.kapowprimary.com/subjects/computing/key-stage-1/year-2/word-processing/	Programming 2 ScratchJr https://www.kapowprimary.com/subjects/computing/key-stage-1/year-2/programming-scratch-jr/	Creating media Stop Motion https://www.kapowprimary.com/subjects/computing/key-stage-1/year-2/stop-motion-2/	Data Handling International Space Station https://www.kapowprimary.com/subjects/computing/key-stage-1/year-2/international-space-station/	Online Safety Y2 https://www.kapowprimary.com/subjects/computing/key-stage-1/year-2/online-safety/

Y e a r 3	Computing systems and networks 1 Networks https://www.kapowprimary.com/subjects/computing/lower-key-stage-2/year-3/networks/	Programming Programming Scratch https://www.kapowprimary.com/subjects/computing/lower-key-stage-2/year-3/programming-scratch/	Computing systems and networks 2 Emailing https://www.kapowprimary.com/subjects/computing/lower-key-stage-2/year-3/year-3-emailing-unit/	Computing systems and networks 3 Journey inside a computer https://www.kapowprimary.com/subjects/computing/lower-key-stage-2/year-3/journey-inside-a-computer/	Creating media Video trailers https://www.kapowprimary.com/subjects/computing/lower-key-stage-2/year-3/digital-literacy-2/	Data Handling Comparison cards databases https://www.kapowprimary.com/subjects/computing/lower-key-stage-2/year-3/comparison-cards-databases/	Online Safety Y3 https://www.kapowprimary.com/subjects/computing/lower-key-stage-2/year-3/year-3-online-safety/
Y e a r 4	Computing systems and networks Collaborative learning https://www.kapowprimary.com/subjects/computing/lower-key-stage-2/year-4/collaborative-learning-2/	Programming 1 Further coding with Scratch https://www.kapowprimary.com/subjects/computing/lower-key-stage-2/year-4/programming-1-further-coding-with-scratch/	Creating media Website design https://www.kapowprimary.com/subjects/computing/lower-key-stage-2/year-4/creating-media-website-design/	Skills showcase HTML https://www.kapowprimary.com/subjects/computing/lower-key-stage-2/year-4/html/	Programming 2 Computational thinking https://www.kapowprimary.com/subjects/computing/lower-key-stage-2/year-4/computational-thinking/	Data Handling Investigating weather https://www.kapowprimary.com/subjects/computing/lower-key-stage-2/year-4/investigating-weather/	Online Safety Y4 https://www.kapowprimary.com/subjects/computing/lower-key-stage-2/year-4/year-4-online-safety/
Y e a r 5	Computing systems and networks Search engines https://www.kapowprimary.com/subjects/computing/upper-key-stage-2/year-5/computing-systems-and-networks-search-engines/	Programming 1 Programming music https://www.kapowprimary.com/subjects/computing/upper-key-stage-2/year-5/programming-music/	Data Handling Mars Rover 1 https://www.kapowprimary.com/subjects/computing/upper-key-stage-2/year-5/mars-rover-1/	Programming 2 Micro:bit https://www.kapowprimary.com/subjects/computing/upper-key-stage-2/year-5/microbit/	Creating media Stop motion animation https://www.kapowprimary.com/subjects/computing/upper-key-stage-2/year-5/creating-media-stop-motion-animation/	Skills showcase Mars Rover 2 https://www.kapowprimary.com/subjects/computing/upper-key-stage-2/year-5/mars-rover-2/	Online Safety Y5 https://www.kapowprimary.com/subjects/computing/upper-key-stage-2/year-5/year-5-online-safety/
Y e a r 6	Computing systems and networks Bletchley Park https://www.kapowprimary.com/subjects/computing/upper-key-stage-2/year-6/computing-systems-and-networks-bletchley-park/	Programming Intro to Python https://www.kapowprimary.com/subjects/computing/upper-key-stage-2/year-6/intro-to-python/	Data Handling Big data 1 https://www.kapowprimary.com/subjects/computing/upper-key-stage-2/year-6/big-data-1/	Creating media History of Computers https://www.kapowprimary.com/subjects/computing/upper-key-stage-2/year-6/creating-media-history-of-computers/	Data Handling Big data 2 https://www.kapowprimary.com/subjects/computing/upper-key-stage-2/year-6/big-data-2/	Skills showcase Inventing a product https://www.kapowprimary.com/subjects/computing/upper-key-stage-2/year-6/skills-showcase/	Online Safety Y6 https://www.kapowprimary.com/subjects/computing/upper-key-stage-2/year-6/online-safety-year-6/

	Intent	Implementation			Impact
	Nursery-	Substantive Knowledge:		Vocabulary:	Disciplinary Knowledge:

<p>In Foundation stage, the children will explore computing, to ensure that they develop listening skills, problem-solving skills, and thoughtful questioning. As well as improving subject skills across the seven areas of learning.</p>	<p>Reception</p>	<p><u>Substantive Knowledge:</u></p> <p><u>Computing systems and networks 1: Using a computer.</u></p> <ul style="list-style-type: none"> • Learning about the main parts of a computer and how to use the keyboard and mouse. • Logging in and out. 	<p><u>Vocabulary:</u></p> <p><u>Using a computer:</u></p> <ul style="list-style-type: none"> • Computer • Monitor • Keyboard • Mouse • Log in • Log out • Left click • Right click • Arrow • Cursor • Click • Drag • Move • Drop 	<p><u>Disciplinary Knowledge:</u></p> <p><u>Physical development</u></p> <p>Develop their small motor skills so that they can use a range of tools competently, safely and confidently.</p> <p><u>Characteristics of Effective Learning</u></p> <p>Playing and exploring Active learning</p>
		<p><u>Substantive Knowledge:</u></p> <p><u>Programming 1: All about instructions</u></p> <p>The children learn to receive and give instructions and understand the importance of precise instructions.</p>	<p><u>Vocabulary:</u></p> <p><u>Programming:</u></p> <ul style="list-style-type: none"> • Instructions • Order • Sequence • Algorithm • Predict • Prediction • Next • Last • First • Second • Third 	<p><u>Disciplinary Knowledge:</u></p> <p><u>Programming:</u></p> <p><u>Communication and language</u></p> <p>Describe events in some detail.</p> <p><u>Characteristics of Effective Learning</u></p> <p>Active learning Creating and thinking critically</p>

		<p><u>Substantive Knowledge:</u></p> <p><u>Computing systems and networks 2: Exploring hardware</u></p> <p>Tinkering and exploring with different computer hardware and learning to operate a camera.</p>	<p><u>Vocabulary:</u></p> <p><u>Exploring Hardware:</u></p> <ul style="list-style-type: none"> • Camera • iPad • Tablet • Lens • Point • Shoot • Capture • Picture • Image • Gallery • Record • Photograph • Photographer • Still • Blurred • Blurry • Crisp • Clear • Selfie 	<p><u>Disciplinary Knowledge:</u></p> <p><u>Exploring Hardware:</u></p> <p><u>Personal, social and emotional development</u></p> <p>See themselves as a valuable individual</p> <p><u>Literacy</u></p> <p>Spell words by identifying the sounds and then writing the sound with letter/s</p> <p>Write short sentences with words with known sound-letter correspondences using a capital letter and full stop</p>
		<p><u>Substantive Knowledge:</u></p> <p><u>Programming 2: Programming Bee-Bots</u></p> <p>Children learn about directions, experiment with programming a Bee-bot/Blue-bot and tinker with hardware.</p>	<p><u>Vocabulary:</u></p> <p><u>Bee-Bots:</u></p> <ul style="list-style-type: none"> • Instructions • Back • Backwards • Right • Left • Arrow • Circle • Direction • Turn • Straight on • Directions • Program • Algorithms • Sequence • Debug 	<p><u>Disciplinary Knowledge:</u></p> <p><u>Personal, social and emotional development</u></p> <p>ELG: Managing self: Be confident to try new activities and show independence, resilience and perseverance in the face of challenge</p> <p><u>Mathematics</u></p> <p>Count objects, actions and sounds.</p> <p>Link the number symbol (numeral) with its cardinal number value.</p> <p>Count beyond ten.</p> <p><u>Characteristics of Effective Learning</u></p> <p>Playing and exploring</p>

				Active learning Creating and thinking critically
		<p><u>Substantive Knowledge:</u></p> <p><u>Data handling: Introduction to data</u></p> <p>Children sort and categorise data and are introduced to branching databases and pictograms.</p>	<p><u>Vocabulary:</u></p> <p><u>Data:</u></p> <ul style="list-style-type: none"> • Pictogram • Graph • Column • Row • Square • Data • Collect • Record • Count • More • Less • In total • Altogether • Most popular • Least popular 	<p><u>Disciplinary Knowledge:</u></p> <p><u>Mathematics</u></p> <ul style="list-style-type: none"> • Count objects, actions and sounds. • Link the number symbol (numeral) with its cardinal number value. • Subitise. • Count beyond 10. • Compare numbers. • ELG: Numerical patterns: Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity <p><u>Characteristics of Effective Learning</u></p> <ul style="list-style-type: none"> • Active learning
<p>In KS1, children will use technology purposefully to create, organize, store, manipulate and retrieve digital content.</p> <p>They will recognize common uses of information technology beyond school.</p>	<p>In Year 1- The children will learn about how to use a computer and a mouse, log in and out of a computer and navigate around a computer.</p> <p>They will begin to recognize common uses of IT.</p>	<p><u>Substantive Knowledge:</u></p> <p><u>Computing systems and networks: Improving mouse skills:</u></p> <ul style="list-style-type: none"> • Knowing how to log in and navigate around a computer • developing mouse skills • learning how to drag, drop, click and control a cursor to create works of art inspired by Kandinsky and self-portraits. <p><u>Assessing progress and understanding:</u></p> <p>Pupils with secure understanding indicated by: logging in and out of computers unaided; creating a self-portrait</p>	<p><u>Vocabulary:</u></p> <p><u>Computing systems and networks: Improving mouse skills:</u></p> <ul style="list-style-type: none"> • account • computer • log off • log on • mouse • password • predict • screen (monitor) • software • tool • drag 	<p><u>Disciplinary Knowledge:</u></p> <p><u>Computing systems and networks: Improving mouse skills:</u></p> <ul style="list-style-type: none"> ✓ 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

<p>They will use technology safely and respectfully, keeping information private.</p> <p>They will identify where to go for help and support when they have concerns.</p>	<p>They will use technology safely and respectfully.</p>	<p>that includes the key features of a face; using at least two different paint tools.</p> <p>Pupils working at greater depth indicated by: supporting peers with logging in and out of computers; demonstrating easy use of the mouse; using various paint tools to create different effects.</p>	<ul style="list-style-type: none"> • duplicate • redo • click • clipart • undo 	
		<p><u>Programming 1: Algorithms unplugged:</u></p> <ul style="list-style-type: none"> • Using an unplugged approach • algorithms, decomposition and debugging are made relatable to familiar contexts, such as dressing up and making a sandwich • learning why instructions need to be very specific. <p>Assessing progress and understanding</p> <p>Pupils with secure understanding indicated by: identifying bugs and fixing algorithms.</p> <p>Pupils working at greater depth indicated by: identifying more than one way of solving some problems; giving a clear definition of what debugging is</p>	<p><u>Programming 1: Algorithms unplugged:</u></p> <ul style="list-style-type: none"> • algorithm • artificial intelligence • bug • chunks • code • computer • debug • decompose • device • directions • input • instructions • manageable • order • organise • output • program • problem • solution • specific • tasks • virtual assistant 	<p><u>Programming 1: Algorithms unplugged:</u></p> <ul style="list-style-type: none"> ✓ 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.
		<p><u>Skills showcase: Rocket to the moon</u></p> <ul style="list-style-type: none"> • Developing keyboard and mouse skills through designing, building and testing • creating a digital list of materials • using drawing software and recording data. <p>Assessing progress and understanding</p>	<p><u>Skills showcase: Rocket to the moon</u></p> <ul style="list-style-type: none"> • annotate • cells • components • create • data • debug • designing 	<p><u>Skills showcase – Rocket to the moon:</u></p> <ul style="list-style-type: none"> ✓ 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

		<p>Pupils with secure understanding indicated by: measuring distances accurately and inputting data as a group into a spreadsheet.</p> <p>Pupils working at greater depth indicated by: comparing data in a spreadsheet and explaining their interpretations.</p>	<ul style="list-style-type: none"> • digital content • digital image • document • e-document • edit • editing software • editing program • evaluate • folder • graphics • input • instructions • log in • photo • program • order • robot 	<ul style="list-style-type: none"> ✓ Input data about their rockets into a table or spreadsheet
		<p><u>Programming 2: Bee-Bot</u></p> <ul style="list-style-type: none"> • Developing early programming skills using the virtual Bee-Bot. • give clear instructions to the Bee-Bot • explain how it works <p>Assessing progress and understanding</p> <p>Pupils with secure understanding indicated by: programming the Bee-Bot to reach the goal as specified in the story; identifying and correcting mistakes when they go wrong.</p> <p>Pupils working at greater depth indicated by: understanding of route efficiency; suggesting alternative routes.</p>	<p><u>Programming 2: Bee-Bot</u></p> <ul style="list-style-type: none"> • algorithm • Bee-Bot • clear • code • explain • explore • debug • demonstration • filming • instructions • pause • precise • predict • program • review • test • tinker • video 	<p><u>Programming 2: Bee-Bot</u></p> <ul style="list-style-type: none"> ✓ recognize cause and effect when pressing buttons on a virtual Bee-Bot. ✓ Discuss and demonstrate how the virtual Bee-Bot works. ✓ Record video, ensuring everyone is in the shot. ✓ Give several clear instructions in sequence. ✓ Program a virtual Bee-Bot to reach a destination. ✓ Identify and correct mistakes in their programming.

		<p><u>Data handling: Introduction to data</u></p> <ul style="list-style-type: none"> • Learning what data is • Learning the different ways that it can be represented • developing an understanding of why data is useful • understanding how data can be used • understanding ways in which data can be gathered and recorded both by humans and computers. <p>Assessing progress and understanding Pupils with secure understanding indicated by: designing a computerised invention to gather data; explaining how it works.</p> <p>Pupils working at greater depth indicated by: explaining and annotating their design in detail; demonstrating an understanding of various different forms of input and experimenting with different fonts and colours.</p>	<p><u>Data handling: Introduction to data</u></p> <ul style="list-style-type: none"> • 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 	<p><u>Data handling: Introduction to data</u></p> <ul style="list-style-type: none"> ✓ 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 data digitally. ✓ Click and drag objects to sort data using a branching database. ✓ Consider the types of input used to gather different forms of data when designing an invention.
		<p><u>Creating media: Digital imagery</u></p> <ul style="list-style-type: none"> • Using creativity and imagination to plan a miniature adventure story • capture a story using developing photography skills • Learn to enhance photos using a range of editing tools • search for and add other images to a project • create a high-quality photo collage showcase. <p>Assessing progress and understanding Pupils with secure understanding indicated by: recognising that a collage means several photos on a page; adding both images and text; resizing and dragging images around the page.</p>	<p><u>Creating media: Digital imagery</u></p> <ul style="list-style-type: none"> • background • blurred • camera • clear • crop • delete • device • digital camera • download • drag and drop • edit • editing software • filter • image • import • internet • keyword 	<p><u>Creating media: Digital imagery</u></p> <ul style="list-style-type: none"> ✓ 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.

		<p>Pupils working at greater depth indicated by: considering the layout; resizing and adding decoration appropriately.</p>	<ul style="list-style-type: none"> • online • photograph • resize • save as • screen • search engine • sequence • software • storage space • visual effects 	
	<p>In Year 2- Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.</p> <p>Create and debug simple programs. Use logical reasoning to predict the behaviour of simple programs.</p>	<p><u>Substantive Knowledge:</u></p> <p><u>Computing systems and networks 1: What is a computer?</u></p> <ul style="list-style-type: none"> • Exploring what a computer is • identifying and learning how inputs and outputs work. • Understanding how computers are used in the wider world • children design their own computerised invention. <p><u>Assessing progress and understanding</u> Pupils with secure understanding indicated by: recognising computers in the world around them; explaining the role of each computer.</p> <p>Pupils working at greater depth indicated by: suggesting how the computers are connected in different contexts.</p>	<p><u>Vocabulary:</u></p> <p><u>Computing systems and networks 1: What is a computer?</u></p> <ul style="list-style-type: none"> • battery • buttons • computer • desktop • electricity • input • invention • keyboard • laptop • mouse • output • robot • screen (monitor) • tablet • technology • wire 	<p><u>Disciplinary Knowledge:</u></p> <p><u>Computing systems and networks 1: What is a computer?</u></p> <ul style="list-style-type: none"> ✓ Name some computer peripherals and their functions. ✓ 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.

<p>Use technology purposefully to create, organise, store, manipulate and retrieve digital content.</p> <p>Use technology safely and respectfully, keeping personal information private</p>	<p><u>Programming 1: Algorithms and debugging</u></p> <ul style="list-style-type: none"> • Developing an understanding of what algorithms are • Understanding how to program them • Understanding how they can be developed to be more efficient through a range of unplugged and plugged-in activities. <p>Assessing progress and understanding Pupils with secure understanding indicated by: understanding what debugging is; identifying incorrect steps within an algorithm.</p> <p>Pupils working at greater depth indicated by: understanding that the instructions are an important part of debugging; explaining how the ‘computers’ needed the ‘programmers’ to be correct in their algorithmic construction for the processes to work correctly.</p>	<p><u>Programming 1: Algorithms and debugging:</u></p> <ul style="list-style-type: none"> • Abstraction • Algorithm • Artificial intelligence • Bug • Clear • Correct • Data • Debug • Decompose • Error • Key features • Loop • Predict • Unnecessary 	<p><u>Programming 1: Algorithms and debugging:</u></p> <ul style="list-style-type: none"> ✓ 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.
	<p><u>Computing systems and networks 2: Word processing</u></p> <ul style="list-style-type: none"> • Learning about word processing. • Learn how to stay safe online. • Develop touch typing skills. • Be introduced to important keyboard shortcuts. • Be introduced to simple editing tools within a word processor including: bold, italics, underline and font colour. • Learn how to import images. <p>Assessing progress and understanding Pupils with secure understanding indicated by: using a variety of modifications to text including using keyboard shortcuts, bold and italic text as well as including an image.</p> <p>Pupils working at greater depth indicated by: including multiple images with a clear layout as well as adding a link to a website which is relevant to the topic of their writing.</p>	<p><u>Computing systems and networks 2: Word processing:</u></p> <ul style="list-style-type: none"> • back button • backspace • bold • copy • copyright • cut • delete • forward button • highlight • image • import • italic • keyboard • keyboard shortcut • layout • navigate • paste • redo 	<p><u>Computing systems and networks 2: Word processing:</u></p> <ul style="list-style-type: none"> ✓ 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.

			<ul style="list-style-type: none"> • search • space bar • text • text effects • touch typing • underline • undo • word processing 	
		<p>Programming 2: ScratchJr</p> <ul style="list-style-type: none"> • Explore what 'blocks' do, using the app 'ScratchJr,' • Carry out an informative cycle of predict > test > review. • Program a familiar story and an animation of an animal • make a musical instrument by creating buttons and recording sounds • follow an algorithm to record a joke. <p>Assessing progress and understanding Pupils with secure understanding indicated by: recognising which blocks matched to the statements in the algorithm; using the 'cut and paste' paper algorithm when creating the program rather than using trial and error.</p> <p>Pupils working at greater depth indicated by: recognising the pattern from one little pig to the other (for example, the code would be the same); applying the algorithm for one and using it to start programming the second part of the story</p>	<p>Programming 2: ScratchJr:</p> <ul style="list-style-type: none"> • Algorithm • Animation • Blocks • Bug • Button • CGI • Computer code • Debug • Fluid • Imitate • Instructions • Loop • 'On tap' • Programming • Repeat • ScratchJR • Sequence • Sound recording 	<p>Programming 2: ScratchJr:</p> <ul style="list-style-type: none"> ✓ To compare and contrast while drawing connections to the modern day 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'. <p>Explain the role of the blocks in a program they have created.</p>

		<p>Creating media: Stop motion:</p> <ul style="list-style-type: none"> • Storyboarding using a tablet • simple animation creation using a tablet device. <p>Assessing progress and understanding Pupils with secure understanding indicated by: working collaboratively to create an animation; creating an animation of at least 10 frames; evaluating their animation against the criteria.</p> <p>Pupils working at greater depth indicated by: creating an animation with more than 10 frames, including extra features; critically evaluating their animation against the criteria explaining the choices they made.</p>	<p>Creating media: Stop motion:</p> <ul style="list-style-type: none"> • Animation • Background • Decompose • Digital device • Drawing • Flipbook • Frames • Moving images • Object • Onion skinning • Plan • Still images 	<p>Creating media: Stop motion:</p> <ul style="list-style-type: none"> ✓ 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.
		<p>Data handling: International Space Station</p> <ul style="list-style-type: none"> • Learn how astronauts survive on the ISS. • Identify necessary items. • design sensor displays. • explore habitable planets. • gain an understanding of living in space. • understand how space exploration can benefit life on Earth. <p>Assessing progress and understanding Pupils with secure understanding indicated by: using columns and rows in a spreadsheet to retrieve data about planets.</p> <p>Pupils working at greater depth indicated by: asking relevant questions about data in a spreadsheet; explaining how the layout of rows and columns helps retrieve specific data.</p>	<p>Data handling: International Space Station:</p> <ul style="list-style-type: none"> • algorithm • astronaut • column • data • digital content • essential • experiment • Goldilocks zone • interactive map • International Space Station • input • monitor • row • satellite • sensor • space • spreadsheet • survival 	<p>Data handling: International Space Station:</p> <ul style="list-style-type: none"> ✓ 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. ✓ Read data to identify whether a planet might be habitable.

			<ul style="list-style-type: none"> • temperature • thermometer 	
<p>In KS2, the children should be taught to:</p> <ul style="list-style-type: none"> -design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts - use sequence, selection, and repetition in programs; work with variables and various forms of input and output - use logical reasoning to explain how some 	<p>In Year 3, the children should be taught to understand computer networks including the internet; how they can provide multiple services, such as the world wide web, and the opportunities they offer for communication and collaboration. To design, write and debug programs that accomplish specific goals,</p>	<p>Substantive Knowledge:</p> <p><u>Computing systems and networks 1: Networks</u></p> <ul style="list-style-type: none"> • Introduction to the concept of networks • Learn how devices communicate. • From identifying components, learn how information is shared. • deepen this understanding by exploring examples of real-world networks. <p>Assessing progress and understanding</p> <p>Pupils with secure understanding indicated by: identifying the process by which data is transmitted over the internet; recognising that routers connect to send information; understanding that data is broken into packets.</p> <p>Pupils working at greater depth indicated by: explaining how data is transferred and the role of the router within this process; identifying why data is broken into packets.</p>	<p>Vocabulary:</p> <p>Networks:</p> <ul style="list-style-type: none"> • device • file • internet • network • network switch • packet data • router • server • the cloud • user • WiFi • wired • wireless • wireless access point 	<p>Disciplinary Knowledge:</p> <p>Networks:</p> <ul style="list-style-type: none"> ✓ Recognise that a network is two or more devices connected and its purpose. ✓ Identify key components that make up the school’s network. ✓ Explain the difference between wired and wireless connections. ✓ Recognise that files are saved on a server. ✓ Understand the role of the server in a network when requesting a website. ✓ Identify parts of a website’s journey to reach your computer. ✓ Recognise that routers connect to send information. ✓ Understand that data is broken into packets.

<p>simple algorithms work and to detect and correct errors in algorithms and programs</p> <p>- understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration</p> <p>- use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content</p> <p>- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information</p> <p>- use technology safely, respectfully and responsibly; recognise</p>	<p>including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. To use sequence, selection, and repetition in programs; work with variables and various forms of input and output. Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.</p>	<p><u>Programming: Scratch</u></p> <ul style="list-style-type: none"> • Build on the use of the ‘ScratchJr’ application in Year 2. • progress to using the more advanced application called ‘Scratch’. • learn to use repetition or ‘loops’. • build upon skills to program an animation, a story and a game. <p>Assessing progress and understanding Pupils with secure understanding indicated by: explaining what an algorithm is; understanding the purpose of an algorithm; using a class algorithm when creating a program.</p> <p>Pupils working at greater depth indicated by: beginning to form algorithms independently by completing challenge activities (see Resource: Robot bop remix – challenge).</p>	<p><u>Scratch:</u></p> <ul style="list-style-type: none"> • algorithm • animation • application • code • code block • debug • decompose • game • interface • loop • predict • program • remixing code • repetition code • review • Scratch • sprite • tinker 	<p><u>Scratch:</u></p> <ul style="list-style-type: none"> ✓ 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 by remixing code. ✓ Recognise where something on screen is controlled by code. ✓ Use a systematic approach to find bugs. ✓ Understand the definitions of decomposition and algorithm and how they are used to create accurate code.
		<p><u>Computing systems and networks 2: Emailing</u></p> <ul style="list-style-type: none"> • Learn how to send and edit emails. • Learn how to add attachments. • Understand how to be a responsible digital citizen. • Think about the content of what is sent. <p>Assessing progress and understanding Pupils with secure understanding indicated by: sending an email describing ways to avoid being tricked by fake emails.</p> <p>Pupils working at greater depth indicated by: explaining in their emails how to avoid scammers as well as showing a clear understanding of how to avoid fake emails.</p> <p>Note: Please use Microsoft Office 365 (not Google) when delivering this unit.</p>	<p><u>Emailing:</u></p> <ul style="list-style-type: none"> • Attachment • Bcc (Blind carbon copy) • Cc (Carbon copy) • Compose • Content • Cyberbullying • Document • Domain • Download • Email • Email account • Email address • Emoji • Emotions • Fake • Font • Genuine 	<p><u>Emailing:</u></p> <ul style="list-style-type: none"> ✓ Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. ✓ Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. ✓ Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.

<p>acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact</p>			<ul style="list-style-type: none"> • 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 • 	
		<p><u>Computing systems and networks 3: Journey inside a computer:</u></p> <ul style="list-style-type: none"> • Assume the role of computer parts. • Create paper versions of computers to consolidate an understanding of how a computer works. • Identify similarities and differences between various models. 	<p><u>Journey inside a computer:</u></p> <ul style="list-style-type: none"> • Algorithm • Assemble • CPU (central processing unit) • Data • Decompose • Desktop • Disassemble • GPU (graphics processing unit) • Hard drive • HDD (hard disk drive) 	<p><u>Journey inside a computer:</u></p> <ul style="list-style-type: none"> ✓ 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.

		<p>Assessing progress and understanding</p> <p>Pupils with secure understanding indicated by: recognising some computer parts relating to functions and making some laptop and tablet comparisons.</p> <p>Pupils working at greater depth indicated by: explaining what each component does.</p>	<ul style="list-style-type: none"> • 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 	
		<p><u>Creating media: Video trailers (Previously called 'Digital literacy')</u></p> <ul style="list-style-type: none"> • Developing filming and editing video skills. • Storyboarding. • Creation of book trailers. <p>Assessing progress and understanding</p> <p>Pupils with secure understanding indicated by: identifying and articulating what makes a successful book trailer; suggesting how to share book recommendations with others.</p> <p>Pupils working at greater depth indicated by: sharing ideas for the success criteria for both book trailers and videos in general, based on book trailers they have seen; sharing ideas on how to recommend books to others.</p>	<p><u>Video Trailers:</u></p> <ul style="list-style-type: none"> • Application • Camera angle • Clip • Cross dissolve • Edit • Fade to black • Fade to white • Film • Film editing software • Graphics • Import • Key events • Music • Photo • Plan 	<p><u>Video Trailers:</u></p> <ul style="list-style-type: none"> ✓ 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. ✓ Add text to a video. ✓ Incorporate transitions between images. ✓ Evaluate their own and others' trailers.

		<p>Note: Please use iPads when delivering this unit.</p>	<ul style="list-style-type: none"> • Recording • Slide • Sound effects • Storyboard • Time code • Trailer • Transition • Video • Voiceover • Wipe 	
		<p><u>Data handling: Comparison cards databases</u></p> <ul style="list-style-type: none"> • Learn about records, fields and data. • Further explore the concepts of sorting and filtering. 	<p><u>Comparison cards databases:</u></p> <ul style="list-style-type: none"> • Categorise • Category • Chart • Data • Database • Excel • Fields • Filter • Graph • Information • Interpret • PDF • Questionnaire • Record • Representation • Sort • Spreadsheet 	<p><u>Comparison cards databases:</u></p> <ul style="list-style-type: none"> ✓ 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. ✓ Explain the purpose of visual representations of data.

	<p>In year 4, the children are taught to understand computer networks, including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration. Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.</p>	<p><u>Substantive Knowledge:</u></p> <p><u>Computing systems and networks: Collaborative learning</u></p> <ul style="list-style-type: none"> • Work collaboratively. • work in a responsible and considerate way. • look at a range of collaborative tools. <p><u>Assessing progress and understanding</u> Pupils with secure understanding indicated by: exporting data to a spreadsheet; highlighting data using conditional formatting; calculating averages and sums of numbers.</p> <p>Pupils working at greater depth indicated by: exploring the power of spreadsheets in more depth; creating graphs.</p> <p>Note: Please use Microsoft Office 365 (not Google) when delivering this unit.</p>	<p><u>Vocabulary:</u></p> <p><u>Collaborative learning:</u></p> <ul style="list-style-type: none"> • 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 	<p><u>Disciplinary Knowledge:</u></p> <p><u>Collaborative learning:</u></p> <ul style="list-style-type: none"> ✓ 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. ✓ Plan a survey for Microsoft Form with a range of different questions types that will provide different types of answer, e.g. text, multiple choice or numerical values. ✓ Create a Microsoft Form with a range of different question types that will provide different types of answer, e.g. text, multiple choice or numerical values. ✓ Export data to a spreadsheet, highlighting data, using conditional formatting and calculating averages and sums of numbers.
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		<p><u>Programming 1: Further coding with Scratch</u></p> <ul style="list-style-type: none"> • Learn the basics of programming in Scratch. • create a simple script. • use decomposition. • understand what variables are. <p>Assessing progress and understanding Pupils with secure understanding indicated by: understanding what a variable is and how it works within a program.</p> <p>Pupils working at greater depth indicated by: using a range of variables to improve a Scratch game; tinkering to change the sprite's costume depending on whether a user gives a correct or incorrect answer.</p>	<p><u>Coding with Scratch:</u></p> <ul style="list-style-type: none"> • code block • conditional statement • coordinates • decompose • feature • information • negative number • orientation • position • program • project • script • sprite • stage • tinker • variable 	<p><u>Coding with Scratch:</u></p> <ul style="list-style-type: none"> ✓ Understand how to create a simple script in Scratch. ✓ Add or change a sprite and prevent it 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.
		<p><u>Creating media: Website design</u></p> <ul style="list-style-type: none"> • Develop research, word processing, and collaborative working skills. • Learn how web pages and web sites are created. • Explore how to change layouts, embed images and videos. • Be able to link between pages. <p>Assessing progress and understanding Pupils with secure understanding indicated by: creating a web page with clear sections and with a range of features.</p> <p>Pupils working at greater depth indicated by: creating a web page with at least three sections with a range of features and a consistent style throughout their site.</p>	<p><u>Website design:</u></p> <ul style="list-style-type: none"> • Assessment • Audience • Checklist • Collaboration • Content • Contribution • Create • Design • Embed • Evaluate • Features • Google Sites • Hobby • Homepage • Hyperlinks • Images • Insert • Online 	<p><u>Website design:</u></p> <ul style="list-style-type: none"> ✓ Create a Sway with a title, image and a completed first header section. ✓ Create a clear plan for their web page and beginning 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 to include a range of features. ✓ Create a web page with clear sections and with a range of features in.

		<p>Note: Please use Microsoft Office 365 (not Google) when delivering this unit.</p>	<ul style="list-style-type: none"> • Plan • Progress • Published • Record • Review • Style • Subpage • Tab • Theme • Web page • Website • World Wide Web 	
		<p><u>Skills showcase: HTML</u></p> <ul style="list-style-type: none"> • Edit the HTML of a web page • Change the layout of a website and the text and images. <p>Assessing progress and understanding Pupils with secure understanding indicated by: changing an image within a web page and creating their own news story; replacing the text and images of a web page using the inspect tool.</p> <p>Pupils working at greater depth indicated by: adapting longer articles, with more images and investigating some of the other HTML tags within the code.</p>	<p><u>HTML:</u></p> <ul style="list-style-type: none"> • code • content • copyright • CSS • end tag • fake news • hacker • heading • HTML • HTML tags • internet browser • paragraph • remixing • start tag • text • unplugged • URL • web page elements 	<p><u>HTML:</u></p> <ul style="list-style-type: none"> ✓ Recognise the role of HTML in a web page. ✓ Add text between the heading and paragraph tags. ✓ Explore a web page using the inspect tool. ✓ Explain how they altered the HTML to create their posters. ✓ Alter the basic elements within a web page using the inspect tool. ✓ Replace the text and images in a webpage.

		<p><u>Programming 2: Computational thinking</u></p> <ul style="list-style-type: none"> • Develop the four areas of computational thinking through a range of plugged and unplugged activities. <p>Assessing progress and understanding Pupils with secure understanding indicated by: understanding how computational thinking can help to solve problems; applying computational thinking to problems they face.</p> <p>Pupils working at greater depth indicated by: applying computational thinking skills to their challenges to solve them quickly and accurately; discussing and reviewing answers with their partners.</p>	<p><u>Computational thinking:</u></p> <ul style="list-style-type: none"> • abstraction • algorithm • code • computational thinking • decomposition • input • logical reasoning • output • pattern recognition • script • sequence • variable 	<p><u>Computational thinking:</u></p> <ul style="list-style-type: none"> ✓ 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. ✓
		<p><u>Data handling: Investigating weather.</u></p> <ul style="list-style-type: none"> • Research and store data using spreadsheets. • Design a weather station which gathers and records data. • Learn how weather forecasts are made. • Use tablets or digital cameras to present a weather forecast. <p>Assessing progress and understanding Pupils with secure understanding indicated by: creating a video that includes weather forecast information.</p> <p>Pupils working at greater depth indicated by: editing and refining their forecasts using editing software or clearly explaining how they could improve their films if they had editing software available.</p>	<p><u>Investigating weather:</u></p> <ul style="list-style-type: none"> • accurate • climate zone • condensation • cylinder • degree Celsius • evaporation • extreme weather • filming • forecast • heat sensor • lightning • measurement • pinwheel • presenter • rain • satellite • script • sensor data • solar panel • temperature • thermometer • tornado 	<p><u>Investigating weather:</u></p> <ul style="list-style-type: none"> ✓ 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. ✓ Create a video which includes weather forecast information.

			<ul style="list-style-type: none"> • weather • weather forecast • wind speed 	
	<p>In year 5, the children will learn to use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.</p> <p>Design, write and debug programs that accomplish specific goals. Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create</p>	<p>Substantive Knowledge:</p> <p>Computing systems and networks: Search engines</p> <ul style="list-style-type: none"> • Expand on research skills. • Find accurate information. <p>Assessing progress and understanding Pupils with secure understanding indicated by: making parallels between book searching and internet searching; explaining the role of web crawlers; recognising that results are rated to decide rank.</p> <p>Pupils working at greater depth indicated by: suggesting ways to make a website of their choice rank higher.</p>	<p>Vocabulary:</p> <p>Search engines:</p> <ul style="list-style-type: none"> • Algorithm • Appropriate • Copyright • Correct • Credit • Data leak • Deceive • Fair • Fake • Inappropriate • Incorrect • Index • Information • Keywords • Network • Privacy • Rank • Real • Search engine • TASK • Web crawler • Website 	<p>Disciplinary Knowledge:</p> <p>Search engines:</p> <ul style="list-style-type: none"> ✓ 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. ✓ Make parallels between book searching and internet searching, explaining the role of web crawlers and recognising that results are rated to decide rank.
		<p>Programming 1: Music</p> <ul style="list-style-type: none"> • Apply programming skills. • To create sounds. 	<p>Music:</p> <ul style="list-style-type: none"> • Beat • Buffer 	<p>Music:</p> <ul style="list-style-type: none"> ✓ Iterate ideas, testing and changing throughout the lesson.

	<p>a range of programs.</p>	<ul style="list-style-type: none"> • To create melodies. • To work towards a battle of the bands performance. <p>Assessing progress and understanding Pupils with secure understanding indicated by: coding a piece of music that combines a variety of structures; using loops in their programming; recognising that programming music is a way to apply their skills.</p> <p>Pupils working at greater depth indicated by: amending code in a 'live' scenario.</p> <p>Note: Please use Option 2: Scratch (tablet and Chromebook users) not Sonic Pi when delivering this unit.</p>	<ul style="list-style-type: none"> • Bugs • Coding • Commands • Debug • Decompose • Error • Format • Instructions • Live loops • Loop • Melody • Mindmap • Music • Output • Performance • Pitch • Play • Predict • Programming • Rehearsal • Repetition • Rhythm • Sleep • Sonic Pi • Soundtrack • Spacing • Tempo • Timbre • Tinker • Tutorials • Typing • Typo 	<ul style="list-style-type: none"> ✓ Explain what the basic commands do: 'play', 'slee'p, '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. ✓ 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.
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		<p><u>Data handling: Mars Rover 1</u></p> <ul style="list-style-type: none"> • Identify some of the types of data that the Mars Rover collects • Explain how the Mars Rover transmits the data back to Earth. • read binary numbers, and understand binary addition • identify input, processing and output on the Mars Rovers. <p>Assessing progress and understanding Pupils with secure understanding indicated by: relating binary signals (Boolean) to a simple character-based language (ASCII).</p> <p>Pupils working at greater depth indicated by: explaining how ASCII works and how to use it.</p>	<p><u>Mars Rover 1:</u></p> <ul style="list-style-type: none"> • 8-bit binary • addition • ASCII • binary code • boolean • byte • CPU • data • data transmission • decimal numbers • discovery • distance • Hexadecimal • input • Mars Rover • the Moon • numerical data • output • planet • radio signal • RAM • scientist • sequence • signal • simulation • space • subtraction 	<p><u>Mars Rover 1:</u></p> <ul style="list-style-type: none"> ✓ Identify some types of data the Mars Rover could collect (for example, photos). ✓ Explain how the Mars Rover transmits the data back to Earth and the challenges involved. ✓ 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 character-based language, ASCII.
		<p><u>Programming 2: Micro:bit</u></p> <ul style="list-style-type: none"> • Clip blocks together in a program. • Predict what will happen while making connections with previously used programming interfaces. • Create animations. • Recognise inputs/outputs. • Choose appropriate blocks. 	<p><u>Micro:bit:</u></p> <ul style="list-style-type: none"> • Polling • Predict • Program • Repetition • Reset • Sabotage • Scoreboard • Screen • Systematic 	<p><u>Micro:bit:</u></p> <ul style="list-style-type: none"> ✓ 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'.

		<ul style="list-style-type: none"> • Break programs down into smaller steps. <p>Assessing progress and understanding Pupils with secure understanding indicated by: breaking a program down into smaller steps, suggesting appropriate blocks and matching the algorithm to the program.</p> <p>Pupils working at greater depth indicated by: independently adding in additional functionality, such as a reset button.</p>	<ul style="list-style-type: none"> • Tablet • Tinkering • USB • Variables • Wifi • Wireless • Wires 	<ul style="list-style-type: none"> ✓ Recognise blocks they've used previously, identifying inputs and outputs used and make predictions about how variables work. ✓ 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.
		<p><u>Creating media: Stop motion animation.</u></p> <ul style="list-style-type: none"> • Storyboard ideas. • Take photographs and edit to create a video animation. <p>Assessing progress and understanding Pupils with secure understanding indicated by: creating a clear animation with added effects such as extending parts and using a title; providing helpful feedback to other groups about their animations.</p> <p>Pupils working at greater depth indicated by: creating a detailed animation featuring multiple interacting objects, film extensions and use of titles; explaining the effects used; offering advanced feedback on software use and filming techniques.</p> <p>Note: Please use Option 1: Stop Motion Studio (not: with cameras) when delivering this unit.</p>	<p><u>Stop motion animation:</u></p> <ul style="list-style-type: none"> • Create a toy with simple images and a single movement. • Create a short stop motion with small changes between images. • Think of a simple story idea for their animation and 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. • Add effects such as extending parts and titles. • Provide helpful feedback to other groups about their animations. 	<p><u>Stop motion animation:</u></p> <ul style="list-style-type: none"> ✓ Create a toy with simple images and a single movement. ✓ Create a short stop motion with small changes between images. ✓ Think of a simple story idea for their animation and 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. ✓ Add effects such as extending parts and titles. ✓ Provide helpful feedback to other groups about their animations.

		<p><u>Skills showcase: Mars Rover 2</u></p> <ul style="list-style-type: none"> • Learn about pixels and binary. • Create a pixel picture and saving a JPEG as a bitmap. • Understand the transfer of image data. • Learn about the 'fetch, decode, execute' cycle and its real-world applications. • Begin to use 3D design tools. <p>Assessing progress and understanding Pupils with secure understanding indicated by: applying tools and techniques learnt in Tinkercad tutorials to create a Mars rover tyre design; including a feature to address the terrain challenges on Mars; explaining the design choices and features of their tyre design.</p> <p>Pupils working at greater depth indicated by: creating a tyre design that demonstrates an understanding of the terrain on Mars; explaining in detail the tyre design; discussing potential improvements.</p>	<p><u>Mars Rover 2:</u></p> <ul style="list-style-type: none"> • Data • Drag and drop • Fetch, decode, execute • ID card • Input • JPEG • Memory • Online community • Operating system • Output • Pixels • RAM • Responsible • RGB • ROM • Safe 	<p><u>Mars Rover 2:</u></p> <ul style="list-style-type: none"> ✓ 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 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.
	<p>In year 6, the children will select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.</p>	<p><u>Substantive Knowledge:</u></p> <p><u>Computing systems and networks: Bletchley Park and the history of computers</u></p> <ul style="list-style-type: none"> • Discover the history of Bletchley Park, historical figures and computer science. • Learn about code-breaking and password hacking. • Learn about decoding messages. • Present information about historical figures. • Look back in time at how computers have evolved. • Design a computer of the future. • Create an audio advert for their designs. <p>Assessing progress and understanding Pupils with secure understanding indicated by: writing a clear and engaging script; creating a well-performed and edited audio recording.</p>	<p><u>Vocabulary:</u></p> <p><u>Bletchley Park and the history of computers</u></p> <ul style="list-style-type: none"> • acrostic code • audio advert • brute force hacking • Caesar cipher • chip and PIN system • cipher • combination • date shift cipher • discovery • invention • Nth letter cipher • password • pigpen cipher • scrambled 	<p><u>Disciplinary Knowledge:</u></p> <p><u>Bletchley Park and the history of computers</u></p> <ul style="list-style-type: none"> ✓ 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. ✓ Explain the importance of historical figures and their contribution towards computer science. ✓ Present information about their historical figures in an interesting and engaging manner. ✓ Develop an idea for a computer of the future and create a simple design. ✓ Produce a simple audio advert with simple edits, which demonstrate an understanding of how to use the software.

	<p>They will design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.</p>	<p>Pupils working at greater depth indicated by: adding creative elements (e.g. live sound effects) to their adverts; providing insightful feedback to peers about their recordings and the limitations of the software.</p>	<ul style="list-style-type: none"> • script • secret • secure • technological advancement • trial and error 	
	<p>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.</p>	<p><u>New Unit: Coming soon...</u></p> <p><u>Computing systems and networks: AI</u></p> <ul style="list-style-type: none"> • Explore what AI is. • Explore how it generates text, images and code. • Learn about creating and refining prompts to improve AI responses. • Consider the ethical implications of AI and its potential to replace human roles. 	<p><u>AI</u></p> <ul style="list-style-type: none"> • 	<p><u>AI:</u></p> <p>✓</p>

		<p><u>Programming: Intro to Python</u></p> <ul style="list-style-type: none"> • Learn the fundamentals of the programming language of Python. • Test, change and explain what their program does. • Use loops. • Explain what repeats do and what the parts of the loop do. • Recognise that computers choose random numbers and decompose the program into an algorithm. <p>Assessing progress and understanding Pupils with secure understanding indicated by: recognising that computers can choose random numbers; decomposing the program into an algorithm; modifying a program to personalise it.</p> <p>Pupils working at greater depth indicated by: making substantial changes to the original program; applying code snippets from previous lessons.</p>	<p><u>Python:</u></p> <ul style="list-style-type: none"> • Algorithm • Code • Command • Design • Import • Indentation • Input • Instructions • Loop • Output • Patterns • Random • Remix • Repeat • Shape 	<p><u>Python:</u></p> <ul style="list-style-type: none"> ✓ 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 modify a program to personalise it.
		<p><u>Data handling 1: Big Data 1</u></p> <ul style="list-style-type: none"> • Understand the use of big data including barcodes, QR codes, infrared, and RFID technologies. • Create and scan their own QR codes. • Manipulate real-time data in spreadsheets. • Present their findings. • Analyse transport data to understand its usefulness to commuters. <p>Assessing progress and understanding Pupils with secure understanding indicated by: independently sorting and analysing spreadsheet data to answer some customer scenarios.</p> <p>Pupils working at greater depth indicated by: completing six customer scenarios; explaining how data analysis provides a useful service to consumers; creating their own scenarios based on the data for each other to solve.</p>	<p><u>Big Data 1</u></p> <ul style="list-style-type: none"> • algorithm • barcode • boolean • brand • chip • commuter • contactless • data • encrypt • infrared • proximity • QR code • QR scanner • radio waves • RFID • signal • spreadsheet • systems analyst • transmission • wireless 	<p><u>Big Data 1:</u></p> <ul style="list-style-type: none"> ✓ Understand why barcodes and QR codes were created. ✓ 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.

		<p><u>Data handling 2: Big Data 2</u></p> <ul style="list-style-type: none"> • Understand data usage through the use of mobile data vs WiFi. • Understand the Internet of Things, and big data. • Identify high/low data activities. • Prepare presentations on using Big Data/IoT to improve school efficiency while respecting privacy. <p>Assessing progress and understanding Pupils with secure understanding indicated by: presenting their ideas about how Big Data/IoT can improve the school; providing feedback to others on their presentations.</p> <p>Pupils working at greater depth indicated by: persuading their audience of the possibilities and challenges associated with their idea; providing deeper, more informed feedback on their peers' presentations.</p>	<p><u>Big Data 2</u></p> <ul style="list-style-type: none"> • Big Data • Bluetooth • Corrupted • Data • Energy • GPS • Improve • Infrared • Internet of Things • Personal • Privacy • QR codes • Revolution • RFID • SIM • Simulation • Smart city • Smart school • Stop motion • Threat • WiFi • Wireless 	<p><u>Big Data 2:</u></p> <ul style="list-style-type: none"> ✓ 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 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.
		<p><u>Skills showcase: Inventing a product.</u></p> <ul style="list-style-type: none"> • Design a new electronic product. • Use CAD software to design appropriate housing for it. • Develop skills in website design, video editing, and persuasive language. • Promote their product. • Evaluate and adapt existing code. • Debug programs. • Search for accurate information online. <p>Assessing progress and understanding Pupils with secure understanding indicated by: creating a video advert for their project which articulates the key benefits.</p>	<p><u>Inventing a product</u></p> <ul style="list-style-type: none"> • adapt • advert • algorithm • bugs • coding • debugging • design • edit • electronic • evaluate • facts • image rights • images • influence • information • inputs 	<p><u>Inventing a product:</u></p> <ul style="list-style-type: none"> ✓ 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. ✓ Create an edited video of their project, articulating the key benefits.

		<p>Pupils working at greater depth indicated by: adding multiple elements to an edited video; embedding it in their website.</p>	<ul style="list-style-type: none">• loops• manipulation• opinions• output• photos• product• program• repetition• screenshot• search engine• selection• sequence• snippets• software• structures• variables• video• website	<p>✓ Describe and show how to search for information online and be aware of the accuracy of the results presented.</p>
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