



# Computing

## INTENT, IMPLEMENTATION, IMPACT

East Sheen Primary School	Intent	Implementation	Impact
<p><b>EYFS</b> <b>Computing systems and networks 1:</b> Using a computer</p>	<p><b>Pupils will learn:</b> What a keyboard is and how to locate relevant keys, as well as how to log in and out and click and drag using a mouse. Use an online paint tool – to further develop mouse skills, clicking and dragging.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b> To learn what a mouse is and to develop basic mouse skills such as moving and clicking, to use online paint tool to create digital art.</p> <p>EYFS outcomes – Physical Development: Develop their small (fine) motor skills so that they can use a range of tools competently, safely and confidently.</p>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Keyboards</li> <li>• Logging in and logging out</li> <li>• Mouse control - clicking</li> <li>• Mouse control – clicking and dragging</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>• Keyboards</li> <li>• Laptops</li> <li>• Mouse</li> </ul> <p><b>Software needed:</b> n/a</p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>• To know how to log on/off</li> <li>• To name parts of a computer – keyboard, mouse</li> <li>• To use key vocab – computer, screen, keyboard, mouse, drag, dragging, clicking.</li> </ul> <p><b>Key vocabulary:</b> Computing, computer, screen, keyboard, mouse, click, clicking, drag, dragging, log in, log out.</p>
<p><b>Programming 1:</b> All about instructions</p>	<p><b>Pupils will learn:</b> Learning to receive and give instructions and understand the importance of precise instructions.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b> <b>Communication and Language -</b> Understand how to listen carefully and why listening is important. -Describe events in some detail. -Use talk to help work our problems and organise thinking and activities, and to explain how things work and why they might happen.</p> <p><b>Personal, Social and Emotional Development -</b></p>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Following instructions</li> <li>• Giving instructions</li> <li>• Dressing up instructions</li> <li>• Debugging instructions (washing hands)</li> <li>• Predictions</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>• A digital timer (or sand timer).</li> <li>• A smartboard or flip chart to record the children’s instructions.</li> <li>• A camera or tablet.</li> <li>• Bee-bots</li> </ul> <p><b>Software needed:</b> n/a</p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>• To know that being able to follow and give simple instructions is important in computing.</li> <li>• To understand that it is important for instructions to be in the right order.</li> <li>• To understand why a set of instructions may have gone wrong.</li> </ul> <p><b>Key vocabulary:</b> algorithm, debug, describe, first, follow, give, hop, instructions, last, left, next, order, predict, prediction, right, run, second,</p>

	<p>Give focused attention to what the teacher says, responding appropriately even when engaged in activity, and show an ability to follow instructions involving several ideas or actions.</p> <p><b>Physical Development -</b> Know and talk about the different factors that support their overall health and wellbeing. Further develop the skills they need to manage the school day successfully</p>		
<p><b>Online Safety</b></p>	<p><b>Pupils will learn:</b> about online safety and trusted adults.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b> To understand that you need to be safe online and who a trusted adult is.</p>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Reading about Smartie the Penguin and how to stay safe online.</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>• A smartboard</li> </ul> <p><b>Software needed:</b></p> <ul style="list-style-type: none"> <li>• Smartie the Penguin story</li> </ul>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b> How to stay safe online and who to ask for help if they feel unsafe or need help online.</p> <p><b>Key vocabulary:</b> Online safety, Trusted adult, Pop up, Virus, Click</p>
<p><b>Computing Systems and Networks 2:</b> Exploring hardware</p>	<p><b>Pupils will learn:</b> To explore different hardware and learn how to operate a camera.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <p><b>Communication and Language -</b></p> <ul style="list-style-type: none"> <li>• Learn new vocabulary.</li> <li>• Use new vocabulary throughout the day.</li> <li>• Ask questions to find out more and to check they understand what has been said to them. -Articulate their thoughts and ideas in well-formed sentences.</li> <li>• Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen.</li> </ul> <p><b>Physical Development -</b></p>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Exploring a hardware tray</li> <li>• Real world tray</li> <li>• Pictures of play</li> <li>• Picture walk</li> <li>• Class photo album</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>• A selection of disconnected computer hardware: mouse, keyboard, motherboard, USB stick, system fan, hard drive, monitor, computer tower, speakers (you could have multiples of some of the objects).</li> <li>• A digital camera, iPad or tablet.</li> <li>• You will find most of these used in the role play area.</li> </ul> <p><b>Software needed:</b> n/a</p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>• To know that different types of technology can be found at home and in school.</li> <li>• To know that you can take simple photographs with a camera or iPad.</li> <li>• To know that you must hold the camera still and ensure the subject is in the shot to take a photo.</li> </ul> <p><b>Key vocabulary:</b> batteries, blurry, buttons, camera, capture, computer, digital camera, dial, digital clock, electricity, electric toothbrush, gallery, image, iPad, keyboard, keys, lens, mobile phones, monitor, mouse, off, on, on top of, open, photograph, photographer, picture, record, remote control, shoot, shut, smaller, speaker, system fan, tablets, technology, tinker, USB stick, walkie-talkies</p>

	<ul style="list-style-type: none"> <li>• Develop their small motor skills so that they can use a range of tools competently, safely and confidently.</li> <li>• Confidently and safely use a range of large and small apparatus indoors and outside, alone and in a group.</li> </ul>		
<p><b>Data handling:</b> Introduction to data</p>	<p><b>Pupils will learn:</b> To sort and categorise data and are introduced to branching databases and pictograms.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b> <b>Communication and Language -</b> Articulate their thoughts and ideas in well-formed sentences. Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen.</p> <p><b>ELG:</b> Listening, Attention and Understanding - Listen attentively and respond to what they hear with relevant questions, comments and actions when being read to and during whole class discussions and small group interactions.</p> <p><b>ELG:</b> Listening, Attention and Understanding - Make comments about what they have heard and ask questions to clarify their understanding.</p> <p><b>ELG:</b> Speaking - Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary.</p>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Loose parts play</li> <li>• Sorting ourselves</li> <li>• Yes or no question games</li> <li>• Creating branching databases</li> <li>• Exploring pictograms</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>• Camera (optional)</li> </ul> <p><b>Software needed:</b> n/a</p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>• To know that sorting objects into various categories can help you locate information.</li> <li>• To know that using yes/no questions to find an answer is known as a branching database.</li> <li>• To know that a pictogram is a way of showing information.</li> </ul> <p><b>Key vocabulary:</b> Sort, categorise, category, group, describe, texture, colour, pattern, size, weight, height, length, more, less, count, in total, altogether, share, divide, equal, bigger than, smaller than, thicker than, thinner than</p>
<p><b>Year 1</b> <b>Online Safety</b></p>	<p><b>Pupils will learn:</b> Learning about online safety, including using useful tips to stay safe when online; how to manage feelings and emotions when someone or something has upset us online; learning about the responsibility we have as online users; exploring the idea of a 'digital footprint'</p>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Using the internet safely</li> <li>• Online emotions</li> <li>• Always be kind and considerate</li> <li>• Posting and sharing online</li> </ul> <p><b>Equipment and additional hardware needed:</b></p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>• To know that the internet is many devices connected to one another.</li> <li>• To know what to do if you feel unsafe or worried online – tell a trusted adult.</li> </ul>

	<p>Pupils will be given the opportunity to develop the following skills:</p> <ul style="list-style-type: none"> <li>• Recognising devices that are connected to the internet.</li> <li>• Understanding that we are connected to others when using the internet.</li> <li>• Understanding some of the ways we can use the internet.</li> <li>• 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.</li> <li>• Understanding how to interact safely with others online.</li> <li>• Recognising how actions on the internet can affect others.</li> <li>• To be able to recognise what a digital footprint is and how to be careful about posting online.</li> </ul>	<ul style="list-style-type: none"> <li>• Paper plates or plain A4 paper/card for masks – one per pupil.</li> <li>• Ribbon or string – one per pupil.</li> </ul> <p>Software needed: n/a</p> <p>Cross-curricular links: PSHE Relationships</p>	<ul style="list-style-type: none"> <li>• To know that people you do not know on the internet (online) are strangers and are not always who they say they are.</li> <li>• To know that to stay safe online it is important to keep personal information safe.</li> <li>• To know that 'sharing' online means giving something specific to someone else via the internet and 'posting' online means placing information on the internet.</li> </ul> <p>Key vocabulary:</p> <p>Log in, Login, Log off, Computer, Mouse, Mouse pointer, Click, Keyboard, Screen, Password</p>
<p><b>Programming:</b> Algorithms unplugged</p>	<p>Pupils will learn: This unplugged unit requires no computers so that algorithms, decomposition and debugging are made relatable to familiar contexts, such as dressing up and making a sandwich, while learning why instructions need to be very specific</p> <p>Pupils will be given the opportunity to develop the following skills:</p> <ul style="list-style-type: none"> <li>• Recognising that some devices are input devices and others are output devices.</li> <li>• Learning that decomposition means breaking a problem down into smaller parts.</li> <li>• Using decomposition to solve unplugged challenges.</li> <li>• Developing the skills associated with sequencing in unplugged activities.</li> </ul>	<p>Key activities in the unit of work are:</p> <ul style="list-style-type: none"> <li>• What is an algorithm?</li> <li>• Algorithm pictures</li> <li>• Virtual assistants</li> <li>• Step by step</li> <li>• Debugging directions</li> </ul> <p>Equipment and additional hardware needed:</p> <ul style="list-style-type: none"> <li>• Dressing up clothes and accessories, for example, scarves and hats.</li> <li>• Dice (one per pair of children).</li> <li>• Selection of reading books for sorting.</li> <li>• 2D shapes for drawing around.</li> </ul> <p>Software needed: n/a</p> <p>Cross-curricular links: English: Writing – composition, Spoken language</p>	<p>When assessed, pupils will demonstrate the following sticky knowledge:</p> <ul style="list-style-type: none"> <li>• To understand that an algorithm is when instructions are put in an exact order.</li> <li>• To understand that decomposition means breaking a problem into manageable chunks and that it is important in computing.</li> <li>• To understand that decomposition means breaking a problem into manageable chunks and that it is important in computing.</li> <li>• To know that we call errors in an algorithm 'bugs' and fixing these 'debugging'.</li> </ul> <p>Key vocabulary: Order, Instructions, Specific, Solution, Algorithm, Instructions, Computer, Tasks, De-Bug, Code, Correct, Directions, Bug</p>

	<ul style="list-style-type: none"> <li>• Following a basic set of instructions.</li> <li>• Assembling instructions into a simple algorithm.</li> <li>• Learning to debug instructions when things go wrong.</li> <li>• Learning to debug an algorithm in an unplugged scenario.</li> </ul>	<p>Maths: Geometry – properties of shapes, position and direction</p> <p>Geography: Geographical skills and fieldwork</p>	
<p><b>Skills showcase:</b> Rocket to the moon</p>	<p><b>Pupils will learn:</b> Developing keyboard and mouse skills through designing, building and testing individual rockets by creating a digital list of materials, using drawing software and recording data</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>• Learning where keys are located on the keyboard.</li> <li>• Learning how to operate a camera to take photos and videos.</li> <li>• Using logical reasoning to predict the behaviour of simple programs.</li> <li>• Developing the skills associated with sequencing in unplugged activities.</li> <li>• Following a basic set of instructions.</li> <li>• Assembling instructions into a simple algorithm.</li> <li>• Learning to debug instructions when things go wrong.</li> <li>• Learning to debug an algorithm in an unplugged scenario.</li> <li>• Using a basic range of tools within graphic editing software.</li> <li>• Taking and editing photographs.</li> <li>• Developing control of the mouse through dragging, clicking and resizing of images to create different effects.</li> <li>• Developing understanding of different software tools.</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Rocket materials</li> <li>• Rocket design</li> <li>• Rocket building instructions</li> <li>• Making a rocket</li> <li>• Rocket launching</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>• Sturdy paper or firm card – two sheets per group.</li> <li>• A copy of the book Moonshot: The Flight of Apollo 11 by Brian Floca</li> <li>• Card.</li> <li>• Tape.</li> <li>• Cardboard boxes.</li> <li>• Plastic bottles – one per group.</li> <li>• Other materials such as foil, plastic packaging, felt tips, coloured paper, sequins, tissue paper etc.</li> <li>• Trundle wheels or metre sticks.</li> <li>• Foam javelin or your own bottle rocket to model launching a rocket.</li> </ul> <p><b>Software needed:</b></p> <ul style="list-style-type: none"> <li>• Sketchpad</li> </ul> <p><b>Cross-curricular links:</b> Design and Technology: Design, Make, Evaluate, Technical knowledge</p> <p>Mathematics: Measurement</p> <p>English:</p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>• To know that when we create something on a computer it can be more easily saved and shared than a paper version.</li> <li>• To know some of the simple graphic design features of a piece of online software.</li> <li>• To know that a spreadsheet is an electronic 'table' for sorting data.</li> </ul> <p><b>Key vocabulary:</b></p> <p>Designing, Graphics, Editing software, Create, Program, Digital image, Folder, Materials, Document, Computer, Save, Components, Annotate</p>

	<ul style="list-style-type: none"> <li>Recognising devices that are connected to the internet.</li> <li>Understanding that technology can be used to represent data in different ways: pictograms, tables, pie charts, bar charts, block graphs etc.</li> <li>Logging in and out and saving work on their own account.</li> </ul>	<p>Writing – composition, Reading – comprehension</p> <p>Science: Everyday materials</p>	
<p><b>Programming:</b> Bee-bot</p>	<p><b>Pupils will learn:</b> Exploring commands, instructions and errors through the use of a Bee-Bot.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>Recognising that robots are programmed by humans.</li> <li>Explaining what they are trying to achieve with their algorithms.</li> <li>Writing clear, sequenced algorithms for familiar tasks.</li> <li>Using terms like ‘start,’ ‘end’ and ‘next’ to describe the steps in algorithms.</li> <li>Changing their instructions or algorithms into code that the robot understands.</li> <li>Beginning to identify errors in algorithms.</li> <li>Making suggestions for how to fix errors in algorithms.</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>Write instructions for a person to follow.</li> <li>Carry out instructions written for a person to follow.</li> <li>Explain what each Bee-Bot button does.</li> <li>Create and test a short set of instructions.</li> <li>Check instructions and spot errors.</li> <li>Test instructions to check for further errors.</li> <li>Program a Bee-Bot using logical instructions.</li> <li>Identify and correct mistakes in a sequence when the Bee-Bot does not behave as expected.</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>Building blocks.</li> <li>Bee-Bots</li> <li>iPads</li> <li>A large space, the school hall or playground.</li> <li>Several coloured cones, depending on the size of the space.</li> </ul> <p><b>Software needed:</b> n/a</p> <p><b>Cross-curricular links:</b> Maths: Geometry – position and direction</p> <p>Geography:</p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>Humans need to give robots instructions to follow and that they will carry out these instructions exactly, even if they are wrong.</li> <li>Humans need to give instructions in the correct language for the robot to understand.</li> <li>An algorithm is a set of instructions used to carry out a task.</li> <li>Algorithms must give every step of a task.</li> <li>Algorithms must give clear, sequenced instructions.</li> <li>There may be an error if a set of instructions (an algorithm) does not give the expected result.</li> <li>Errors could result from sequencing issues, unclear instructions or missing steps.</li> </ul> <p><b>Key vocabulary:</b> command error instructions program</p>

		Geographical skills and fieldwork  English: Reading – comprehension, Spoken language	
<b>Creating media:</b>  Digital imagery	<p><b>Pupils will learn:</b> Using creativity and imagination to plan a miniature adventure story and capture it using developing photography skills. Learn to enhance photos using a range of editing tools as well as searching for and adding other images to a project, resulting in a high-quality photo collage showcase.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>• Learning how to explore and tinker with hardware to find out how it works.</li> <li>• Learning where keys are located on the keyboard.</li> <li>• Learning how to operate a camera to take photos and videos.</li> <li>• Developing the skills associated with sequencing in unplugged activities.</li> <li>• Using a basic range of tools within graphic editing software.</li> <li>• Taking and editing photographs.</li> <li>• Developing control of the mouse through dragging, clicking and resizing of images to create different effects.</li> <li>• Developing understanding of different software tools.</li> <li>• Searching and downloading images from the internet safely.</li> <li>• 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.</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Planning a photo story</li> <li>• Taking photos</li> <li>• Editing photos</li> <li>• Searching for images</li> <li>• Photo collage</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>• A selection of small people toys and animals/dinosaurs.</li> <li>• Picture book (optional).</li> <li>• Small world play characters – one person and one animal per group.</li> <li>• Digital cameras/tablets – maximum one per groups of four pupils.</li> </ul> <p><b>Software needed:</b></p> <ul style="list-style-type: none"> <li>• Microsoft Photos</li> <li>• Microsoft PowerPoint</li> </ul> <p><b>Cross-curricular links:</b> English: Reading – comprehension</p> <p>PSHE: Online safety</p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>• To understand that holding the camera or device still and considering angles and light are important to take good pictures.</li> <li>• To know that you can edit, crop and filter photographs.</li> <li>• To know how to search safely for images online.</li> </ul> <p><b>Key vocabulary:</b></p> <p>Screen, Camera, Image, Digital, Tablet, Photo, Deleting, Device, Storage space, Editing, Software, Visual effects, Crop, Filter</p>
<b>Computing systems and networks:</b>	<p><b>Pupils will learn:</b> Learning how to login and navigate around a computer, developing mouse skills, learning how to drag, drop, click and control</p>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Logging in</li> <li>• Click and drag skills</li> <li>• Drawing shapes</li> </ul>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p>

<p>Improving mouse skills</p>	<p>a cursor to create works of art inspired by Kandinsky and self-portraits</p> <p>Pupils will be given the opportunity to develop the following skills:</p> <ul style="list-style-type: none"> <li>To explore hardware to find out how it works.</li> <li>To locate keys on the keyboard.</li> <li>To use a basic range of tools within graphic editing software.</li> <li>To developing control of the mouse through dragging, clicking and resizing of images to create different effects.</li> <li>To develop an understanding of different software tools.</li> <li>To recognise devices that are connected to the internet.</li> <li>To log in and out and saving work.</li> </ul>	<ul style="list-style-type: none"> <li>Drawing a story</li> <li>Self-portrait</li> </ul> <p>Equipment and additional Hardware needed:</p> <ul style="list-style-type: none"> <li>Mirrors or photography software</li> </ul> <p>Software needed:</p> <ul style="list-style-type: none"> <li>Sketchpad</li> </ul> <p>Cross-curricular links:</p> <p>PSHE: Online safety</p> <p>Maths: Geometry – properties of shapes</p> <p>English: Reading – comprehension</p>	<ul style="list-style-type: none"> <li>To know that “log in” and “log out” means to begin and end a connection with a computer.</li> <li>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.</li> <li>To know that passwords are important for security.</li> </ul> <p>Key vocabulary:</p> <p>Log in, Login, log out / off, Mouse, Mouse pointer, Click, Keyboard, Screen, Password, Account, Software, Duplicate, Ctrl, Tools, Right click, Menu, Layers, Username, Drag, Drag and drop, Digital photograph, Undo, Cursor</p>
<p><b>Year 2</b></p> <p><b>Online safety</b></p>	<p>Pupils will learn: All about online safety, including: what happens to information posted online; how to keep things private online; who we should ask before sharing online; describing different ways to ask for, give, or deny permission online.</p> <p>Pupils will be given the opportunity to develop the following skills:</p> <ul style="list-style-type: none"> <li>Identifying whether information is safe or unsafe to be shared online.</li> <li>Learning how to create a strong password.</li> <li>Learning to be respectful of others when sharing online and ask for their permission before sharing content.</li> <li>Learning strategies for checking if something they read online is true.</li> <li>Understanding how to stay safe when talking to people online and what to do if they see or hear</li> </ul>	<p>Key activities in the unit of work are:</p> <ul style="list-style-type: none"> <li>What happens when I post online</li> <li>How do I keep my things safe online</li> <li>Who should I ask?</li> <li>It is my choice?</li> <li>Is it true?</li> </ul> <p>Equipment and additional hardware needed:</p> <ul style="list-style-type: none"> <li>A box or bag full of a few objects that are special e.g. photo of family members, cuddly toys etc.</li> <li>Scissors – at least one per table group</li> </ul> <p>Software needed: n/a</p> <p>Cross-curricular links: PHSE: Relationships</p>	<p>When assessed, pupils will demonstrate the following sticky knowledge:</p> <ul style="list-style-type: none"> <li>To understand the difference between online and offline.</li> <li>To understand what information I should not post online.</li> <li>To know what the techniques are for creating a strong password.</li> <li>To know that you should ask permission from others before sharing about them online and that they have the right to say ‘no.’</li> <li>To understand that not everything I see or read online is true.</li> </ul> <p>Key vocabulary:</p> <p>Accept, Comment, Consent, Content, Deny, Emojis, Offline, Online, Password, Permission, Personal information, Pop ups, Pressure, Private information, Reliable, Share, Terms and conditions, Trusted adult</p>

	something online that makes them feel upset or uncomfortable.		
<b>Programming:</b> Algorithms and debugging	<p><b>Pupils will learn:</b> A combination of unplugged and plugged-in activities to develop an understanding of; what algorithms are, how to program them and how they can be developed to be more efficient, introduction of loops</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>• Developing confidence with the keyboard and the basics of touch typing.</li> <li>• Articulating what decomposition is.</li> <li>• Decomposing a game to predict the algorithms used to create it.</li> <li>• Learning that there are different levels of abstraction.</li> <li>• Explaining what an algorithm is.</li> <li>• Following an algorithm.</li> <li>• Creating a clear and precise algorithm.</li> <li>• Learning that programs execute by following precise instructions.</li> <li>• Incorporating loops within algorithms.</li> <li>• Using logical thinking to explore software, predicting, testing and explaining what it does.</li> <li>• Using an algorithm to write a basic computer program.</li> <li>• Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts.</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Dinosaur algorithm</li> <li>• Machine learning</li> <li>• Through the maze</li> <li>• Making maps</li> <li>• Unplugged debugging</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>• iPads</li> <li>• Whiteboards and pens or notebooks</li> <li>• Lego or building blocks</li> <li>• Mini figures</li> <li>• A3 paper to draw plan views</li> <li>• Coloured pencils for any colour</li> <li>• Partition wall, such as a piece of cardboard</li> <li>• Flat surface, such as a desk</li> </ul> <p><b>Software needed:</b></p> <ul style="list-style-type: none"> <li>• Scratch (website)</li> </ul> <p><b>Cross-curricular links:</b> English: Spoken language, Writing – composition</p> <p>Maths: Geometry – position and direction</p> <p>Geography: Geographical skills and fieldwork</p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>• To understand what machine learning is and how it enables computers to make predictions.</li> <li>• To know that loops in programming are where you set a certain instruction (or instructions) to be repeated multiple times.</li> <li>• To know that abstraction is the removing of unnecessary detail to help solve a problem.</li> </ul> <p><b>Key vocabulary:</b> Algorithm, Decomposition, Debugging, Bugs, Error, Correcting, Programming</p>
<b>Programming:</b> Scratch Jr	<p><b>Pupils will learn:</b> About what 'blocks' do, using the app 'ScratchJr,' by carrying out an informative cycle of predict &gt; test &gt; review, programme a familiar story and an animation of an</p>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Using ScratchJr</li> <li>• Creating an animation</li> <li>• Making a musical instrument</li> <li>• Programming a joke</li> </ul>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>• To know that coding is writing in a special language so that the computer understands what to do.</li> </ul>

	<p>animal, make their own musical instrument by creating buttons and recording sounds and follow an algorithm to record a joke.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>• Recognising that buttons cause effects and that technology follows instructions</li> <li>• Explaining what an algorithm is.</li> <li>• Following an algorithm.</li> <li>• Creating a clear and precise algorithm.</li> <li>• Learning that programs execute by following precise instructions.</li> <li>• Incorporating loops within algorithms.</li> <li>• Using logical thinking to explore software, predicting, testing and explaining what it does.</li> <li>• Using an algorithm to write a basic computer program.</li> <li>• Using loop blocks when programming to repeat an instruction more than once.</li> <li>• Using software (and unplugged means) to create story animations.</li> </ul>	<ul style="list-style-type: none"> <li>• ‘The Three Little Pigs’ algorithms</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>• iPads</li> </ul> <p><b>Software needed:</b></p> <ul style="list-style-type: none"> <li>• Scratch Jr App</li> </ul> <p><b>Cross-curricular links:</b></p> <p>English: Spoken language, Reading – comprehension</p> <p>Maths: Geometry – position and direction</p>	<ul style="list-style-type: none"> <li>• To understand that the character in ScratchJr is controlled by the programming blocks.</li> <li>• To know that you can write a program to create a musical instrument or tell a joke.</li> </ul> <p><b>Key vocabulary:</b> ScratchJR, Coding, Instructions, Icon, Algorithm, Sequence, Code, Loop</p>
<p><b>Computing systems and networks:</b> What is a computer?</p>	<p><b>Pupils will learn:</b> To explore exactly what a computer is by identifying and learning how inputs and outputs work, how computers are used in the wider world and designing their own computerised invention.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>• Understanding what a computer is and that it’s made up of different components.</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Computer parts</li> <li>• Inputs</li> <li>• Technology safari</li> <li>• Inventions</li> <li>• Real world roleplay</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>• iPads</li> <li>• Sticky notes for each table group – approximately 10 per group</li> <li>• Clipboards – one per group of four pupils.</li> <li>• 10 whiteboards</li> </ul>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>• To know the difference between a desktop and laptop computer.</li> <li>• To know that people control technology.</li> <li>• To know some input devices that give a computer an instruction about what to do (output).</li> <li>• To know that computers often work together.</li> </ul> <p><b>Key vocabulary:</b></p>

	<ul style="list-style-type: none"> <li>Recognising that buttons cause effects and that technology follows instructions.</li> <li>Learning how we know that technology is doing what we want it to do via its output.</li> <li>Using greater control when taking photos with cameras, tablets or computers.</li> <li>Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts.</li> <li>Using word processing software to type and reformat text.</li> <li>Creating and labelling images.</li> <li>Learning how computers are used in the wider world.</li> </ul>	<p><b>Software needed:</b></p> <ul style="list-style-type: none"> <li>Sketchpad</li> </ul> <p><b>Cross-curricular links:</b> English: Spoken Language</p> <p>Science: Working scientifically</p> <p>Design and technology: Design</p>	<p>Input, Output, Device, Technology, Computer, Desktop, Laptop</p>
<p><b>Data Handling:</b> International Space Station</p>	<p><b>Pupils will learn:</b> About the International Space Station (ISS). This is a fascinating real-world setting for teaching how data is collected, used and displayed as well as the scientific learning of the conditions needed for plants and animals, including humans, to survive.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>Developing confidence with the keyboard and the basics of touch typing.</li> <li>Creating and labelling images.</li> <li>Collecting and inputting data into a spreadsheet.</li> <li>Interpreting data from a spreadsheet.</li> <li>Learning how computers are used in the wider world.</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>Homes in space</li> <li>Space bag</li> <li>Warmer, colder</li> <li>Experiments in space</li> <li>Goldilocks planets</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>iPads</li> <li>Thermometers</li> </ul> <p><b>Software needed:</b></p> <ul style="list-style-type: none"> <li>Sketchpad App</li> </ul> <p><b>Cross-curricular links:</b> Science: Animals, including humans; Living things and their habitats</p> <p>Maths: Measurement</p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>To understand that you can enter simple data into a spreadsheet.</li> <li>To understand what steps you need to take to create an algorithm.</li> <li>To know what data to use to answer certain questions.</li> <li>To know that computers can be used to monitor supplies.</li> </ul> <p><b>Key vocabulary:</b> Algorithm, astronaut, data, digital, digital content, experiment, galaxy, insulation, interactive map, International Space Centre, International Space Station, interpret, laboratory, monitor, planet, satellite, sensor, space, temperature, thermometer, water reservoir</p>
<p><b>Creating media:</b> Stop Motion</p>	<p><b>Pupils will learn:</b> Storyboarding and simple animation creation using iPads.</p>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>What is animation?</li> <li>What is stop motion?</li> </ul>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p>

	<p>Pupils will be given the opportunity to develop the following skills:</p> <ul style="list-style-type: none"> <li>Using greater control when taking photos with iPads.</li> <li>Using logical thinking to explore software, predicting, testing and explaining what it does.</li> </ul>	<ul style="list-style-type: none"> <li>My first animation</li> <li>Planning my project</li> <li>Creating my project</li> </ul> <p>Equipment and additional hardware needed:</p> <ul style="list-style-type: none"> <li>iPads</li> <li>Sticky notes – nine/ten per pupil (optional)</li> </ul> <p>Software needed:</p> <ul style="list-style-type: none"> <li>Microsoft Photos</li> </ul> <p>Cross-curricular links:</p> <p>Art and design: By using a range of materials creatively to design and make products.</p>	<ul style="list-style-type: none"> <li>To understand that an animation is made up of a sequence of photographs.</li> <li>To know that small changes in my frames will create a smoother looking animation.</li> <li>To understand what software creates simple animations and some of its features e.g. onion skinning.</li> </ul> <p>Key vocabulary:</p> <p>Stop motion, Animation, Contraption, Video, Photo, Animator, Import image, Software, Upload, Download, Device, Camera</p>
<p><b>Year 3</b></p> <p><b>Computing systems and networks:</b> Networks</p>	<p>Pupils will learn: Introduction to the concept of networks, learning how devices communicate. Identifying components, learning how information is shared and exploring examples of real-world networks. Options for both Google and Microsoft schools.</p> <p>Pupils will be given the opportunity to develop the following skills:</p> <ul style="list-style-type: none"> <li>Learning about the purpose of routers.</li> <li>Understanding the role of the key components of a network.</li> <li>Understanding that websites &amp; videos are files that are shared from one computer to another.</li> <li>Learning about the role of packets.</li> <li>Understanding how networks work and their purpose.</li> <li>Identifying the key components within a network, including whether they are wired or wireless.</li> <li>Recognising links between networks and the internet.</li> <li>Learning how data is transferred.</li> </ul>	<p>Key activities in the unit of work are:</p> <ul style="list-style-type: none"> <li>What's a network?</li> <li>A file's journey</li> <li>A website's journey</li> <li>Routers</li> <li>Understanding packets</li> </ul> <p>Equipment and additional hardware needed:</p> <ul style="list-style-type: none"> <li>Digital cameras or tablets to take photographs with (one between two/three).</li> <li>String.</li> <li>Printed image of any appropriate website homepage cut into 20 pieces.</li> </ul> <p>Software needed:</p> <ul style="list-style-type: none"> <li>Microsoft PowerPoint</li> <li>Scratch (website)</li> </ul> <p>Cross-curricular links:</p> <p>English: Spoken language</p> <p>PSHE: Online relationships</p>	<p>When assessed, pupils will demonstrate the following sticky knowledge:</p> <ul style="list-style-type: none"> <li>To understand what a network is and how a school network might be organised.</li> <li>To know that a server is central to a network and responds to requests made.</li> <li>To know that a router connects us to the internet.</li> <li>To know how the internet uses networks to share files.</li> <li>To know what a packet is and why it is important for website data transfer.</li> </ul> <p>Key vocabulary:</p> <p>Network, Wired, Wireless, WiFi, Device, Internet, Component, Laptop, Tablet, Desktop, Printer, Photocopier, Server, Network switch, Wireless access, Network map, Route</p>

		<p>Maths: Measurement, Statistics</p>	
<p><b>Programming: Scratch</b></p>	<p><b>Pupils will learn:</b> Building on the use of the ‘ScratchJr’ application in Year 2, progress to using the more advanced computer-based application called ‘Scratch’, learning to use repetition or ‘loops’ and building upon skills to program; an animation, a story and a game.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>• Using decomposition to explore the code behind an animation.</li> <li>• Using repetition in programs.</li> <li>• Using logical reasoning to explain how simple algorithms work.</li> <li>• Explaining the purpose of an algorithm.</li> <li>• Forming algorithms independently.</li> <li>• Using logical thinking to explore more complex software; predicting, testing and explaining what it does.</li> <li>• Incorporating loops to make code more efficient.</li> <li>• Continuing existing code.</li> <li>• Making reasonable suggestions for how to debug their own and others’ code.</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Tinkering with Scratch</li> <li>• Using loops</li> <li>• Making an animation</li> <li>• Storytelling</li> <li>• Programming a game</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>• iPads</li> </ul> <p><b>Software needed:</b></p> <ul style="list-style-type: none"> <li>• Scratch (website)</li> </ul> <p><b>Cross-curricular links:</b> English: Spoken language, Writing – composition</p> <p>Music</p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>• To know that Scratch is a programming language and some of its basic functions.</li> <li>• To understand how to use loops to improve programming.</li> <li>• To understand how decomposition is used in programming.</li> <li>• To understand that you can remix and adapt existing code.</li> </ul> <p><b>Key vocabulary:</b> Tinkering, Programming application, Coding application, Code, Application, Interface, Sprite, Review, Predict, loop, repetition</p>
<p><b>Computing systems and networks: Emailing</b></p>	<p><b>Pupils will learn:</b> Learning how to send emails with attachments and how to be a responsible digital citizen by thinking about the contents of what is sent.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>• Learning to log in and out of an email account.</li> <li>• Writing an email including a subject, ‘to’ and ‘from’.</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Communicating with technology</li> <li>• Sending an email</li> <li>• Adding attachments</li> <li>• Be kind online</li> <li>• Fake emails</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>• iPads</li> </ul> <p><b>Software needed:</b></p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>• To understand that email stands for ‘electronic mail.’</li> <li>• To know that an attachment is an extra file added to an email.</li> <li>• To understand that emails should contain appropriate and respectful content.</li> <li>• To know that cyberbullying is bullying using electronics such as a computer or phone.</li> </ul>

	<ul style="list-style-type: none"> <li>• Sending an email with an attachment.</li> <li>• Replying to an email.</li> <li>• Understanding the purpose of emails.</li> <li>• Learning about cyberbullying.</li> </ul> <p>Learning that not all emails are genuine, recognising when an email might be fake and what to do about it.</p>	<ul style="list-style-type: none"> <li>• Microsoft outlook</li> </ul> <p>Cross-curricular links: English: Writing – composition</p> <p>PSHE: Online relationships</p>	<p><i>Key vocabulary:</i> Network, Wired, Wireless, WiFi, Device, Internet, Email, Log in, Log out, Information, Responsible citizen, WiFi, Image, Video, Sign in, Username, Domain, Computer, Email address, Password, Settings, Theme, Email account, Composing an email, Sending an email, Subject bar, Spam, Attachment</p>
<p><b>Computing systems and networks:</b> Journey inside a computer</p>	<p><b>Pupils will learn:</b> Assuming the role of computer parts and creating paper versions of computers helps to consolidate an understanding of how a computer works, as well as identifying similarities and differences between various models.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>• Understanding what the different components of a computer do and how they work together.</li> <li>• Drawing comparisons across different types of computers.</li> <li>• Using decomposition to explain the parts of a laptop computer.</li> <li>• Explaining the purpose of an algorithm.</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Inputs and outputs</li> <li>• Building a paper laptop</li> <li>• Following instructions</li> <li>• Computer memory</li> <li>• Dismantling a tablet</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>• Pieces of string</li> <li>• Large sized paper – one piece per table</li> <li>• Felt tip pens – variety of colours on each table.</li> <li>• iPads</li> </ul> <p><b>Software needed:</b></p> <ul style="list-style-type: none"> <li>• Sketchpad</li> </ul> <p><b>Cross-curricular links:</b> English: Spoken language</p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>• To know the roles that inputs and outputs play on computers.</li> <li>• To know what some of the different components inside a computer are e.g. CPU, RAM, hard drive, and how they work together.</li> <li>• To know what a tablet is and how it is different from a laptop/desktop computer.</li> </ul> <p><i>Key vocabulary:</i> Input, Output, Computer, Monitor, Keyboard, Mouse, Computer, Data, Program, Tablet, Desktop, Camera, Microphone, Speaker, Touchscreen, Input, Output, CPU, GPU, RAM, ROM, Hard drive, Storage, Technology</p>
<p><b>Creating media:</b> Video trailers (Previously called 'Digital literacy')</p>	<p><b>Pupils will learn:</b> Developing filming and editing video skills through the storyboarding and creation of book trailers.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>• Using logical thinking to explore more complex software; predicting, testing and explaining what it does.</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Planning a book trailer</li> <li>• Filming</li> <li>• Editing the trailer</li> <li>• Transitions and text</li> <li>• Video reviews</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>• iPads</li> </ul>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>• To know that different types of camera shots can make my photos or videos look more effective.</li> <li>• To know that I can edit photos and videos using film editing software.</li> <li>• To understand that I can add transitions and text to my video.</li> </ul>

	<ul style="list-style-type: none"> <li>• Taking photographs and recording video to tell a story.</li> <li>• Using software to edit and enhance their video adding music and text on screen with transitions.</li> </ul>	<ul style="list-style-type: none"> <li>• Access to a selection of books that the children will be familiar with</li> </ul> <p>Software needed:</p> <ul style="list-style-type: none"> <li>• WeVideo/iMovie app</li> </ul> <p>Cross-curricular links: Reading – comprehension Writing – composition</p>	<p><i>Key vocabulary:</i> Filming, Photos, Digital devices, Video, Storyboard, Trailer, Voiceovers, Text, Sound effects, Music</p>
<p><b>Data handling:</b> Comparison cards databases</p>	<p><b>Pupils will learn:</b> Using the theme of a ‘Comparison cards game’ (based on the popular game, Top Trumps), to understand what a database is by learning the meanings of records, fields and data. Further exploration will lead to the development of the ideas of sorting and filtering.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>• Using logical thinking to explore more complex software; predicting, testing and explaining what it does.</li> <li>• Understanding the vocabulary associated with databases: field, record, data.</li> <li>• Learning about the pros and cons of digital versus paper databases.</li> <li>• Sorting and filtering databases to easily retrieve information.</li> <li>• Creating and interpreting charts and graphs to understand data.</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Records, fields and data</li> <li>• Race against the computer</li> <li>• Sorting and filtering</li> <li>• Representing data</li> <li>• Planning a holiday</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>• iPads</li> <li>• Example of paper databases such as an Argos catalogue or a phone book (optional)</li> </ul> <p>Software needed:</p> <ul style="list-style-type: none"> <li>• Microsoft Forms</li> <li>• Microsoft Excel</li> </ul> <p>Cross-curricular links: Number and place value, Statistics</p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>• To know that a database is a collection of data stored in a logical, structured and orderly manner.</li> <li>• To know that computer databases can be useful for sorting and filtering data.</li> <li>• To know that different visual representations of data can be made on a computer.</li> </ul> <p><i>Key vocabulary:</i> Records, Fields, Data, Information, Spreadsheet, Database, Category, Sort, Filter, Interpret, Data, Database, Spreadsheet, Questionnaire</p>
<p><b>Online safety:</b> Year 3</p>	<p><b>Pupils will learn:</b> Learning about online safety: ‘fake news’, privacy settings, ways to deal with upsetting online content, protecting our personal information on social media.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>• Recognising how social media platforms are used to interact.</li> <li>• Recognising that different information is shared online</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Beliefs, opinions and facts on the internet</li> <li>• When being online makes me upset</li> <li>• Sharing of information</li> <li>• Rules of social media platforms</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>• iPads</li> </ul> <p>Software needed: n/a</p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>• To know that not everything on the internet is true: people share facts, beliefs and opinions online.</li> <li>• To understand that the internet can affect your moods and feelings.</li> <li>• To know that privacy settings limit who can access your important personal information, such as your name, age, gender etc.</li> </ul>

	<p>including facts, beliefs and opinions.</p> <ul style="list-style-type: none"> <li>• Learning how to identify reliable information when searching online.</li> <li>• Learning how to stay safe on social media.</li> <li>• Considering the impact technology can have on mood.</li> </ul>	<p>Cross-curricular links: PHSE</p>	<ul style="list-style-type: none"> <li>• To know what social media is and that age restrictions apply.</li> </ul> <p><i>Key vocabulary:</i> 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 and Wellbeing.</p>
<p><b>Year 4</b></p> <p><b>Computing systems and networks:</b> Collaborative learning</p>	<p><b>Pupils will learn:</b> Working collaboratively in a responsible and considerate way as well as looking at a range of collaborative tools.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>• Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration.</li> <li>• Use online software for documents, presentations, forms and spreadsheets.</li> <li>• Using software to work collaboratively with others.</li> <li>• Understanding that software can be used collaboratively online to work as a team.</li> <li>• Recognising what appropriate behaviour is when collaborating with others online.</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Teamwork</li> <li>• Sharing a document</li> <li>• Microsoft forms 1</li> <li>• Microsoft forms 2</li> <li>• Shared spreadsheets</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>• iPads</li> </ul> <p><b>Software needed:</b></p> <ul style="list-style-type: none"> <li>• Microsoft Word</li> <li>• Microsoft Forms</li> <li>• Microsoft Excel</li> </ul> <p><b>Cross-curricular links:</b> PSHE: Respectful Relationships, courtesy and manners.</p> <p>English: Writing – composition and peer assessment.</p> <p>Maths: Interpreting data, bar charts and time graphs.</p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>• To understand that software can be used collaboratively online to work as a team.</li> <li>• To know what type of comments and suggestions on a collaborative document can be helpful.</li> <li>• To know that you can use images, text, transitions and animation in presentation slides.</li> </ul> <p><i>Key vocabulary:</i> Sharing, Document, Contribution, Suggestions, Collaboration, Typing, Comment, Edited, Replied to, Resolved, Reviewing, comments</p>
<p><b>Programming 1:</b> Further coding with Scratch</p>	<p><b>Pupils will learn:</b> Learning how to send emails with attachments and how to be a responsible</p>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Communicating with technology</li> <li>• Sending an email</li> </ul>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>• To understand that email stands for 'electronic mail.'</li> </ul>

	<p>digital citizen by thinking about the contents of what is sent.</p> <p>Pupils will be given the opportunity to develop the following skills:</p> <ul style="list-style-type: none"> <li>• Learning to log in and out of an email account.</li> <li>• Writing an email including a subject, 'to' and 'from'.</li> <li>• Sending an email with an attachment.</li> <li>• Replying to an email.</li> <li>• Understanding the purpose of emails.</li> <li>• Learning about cyberbullying.</li> <li>• Learning that not all emails are genuine, recognising when an email might be fake and what to do about it.</li> </ul>	<ul style="list-style-type: none"> <li>• Adding attachments</li> <li>• Be kind online</li> <li>• Fake emails</li> </ul> <p>Equipment and additional hardware needed:</p> <ul style="list-style-type: none"> <li>• iPads</li> </ul> <p>Software needed:</p> <ul style="list-style-type: none"> <li>• Microsoft outlook</li> </ul> <p>Cross-curricular links:</p> <p>English: Writing – composition</p> <p>PSHE: Online relationships</p>	<ul style="list-style-type: none"> <li>• To know that an attachment is an extra file added to an email.</li> <li>• To understand that emails should contain appropriate and respectful content.</li> <li>• To know that cyberbullying is bullying using electronics such as a computer or phone.</li> </ul> <p><i>Key vocabulary:</i> Network, Wired, Wireless, WiFi, Device, Internet, Email, Log in, Log out, Information, Responsible citizen, WiFi, Image, Video, Sign in, Username, Domain, Computer, Email address, Password, Settings, Theme, Email account, Composing an email, Sending an email, Subject bar, Spam, Attachment</p>
<p><b>Creating media:</b> Website design</p>	<p><b>Pupils will learn:</b> Children develop their research, word processing, and collaborative working skills whilst learning how web pages and web sites are created, exploring how to change layouts, embed images and videos and link between pages.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>• Building a web page and creating content for it.</li> <li>• Designing and creating a webpage for a given purpose.</li> <li>• Using software to work collaboratively with others.</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Getting to know Microsoft Sway</li> <li>• Book review webpage</li> <li>• Adding features</li> <li>• Planning my website</li> <li>• Creating my website</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>• iPads</li> </ul> <p><b>Software needed:</b></p> <ul style="list-style-type: none"> <li>• Microsoft Sway</li> <li>• Microsoft Word</li> </ul> <p><b>Cross-curricular links:</b> PSHE: Online Relationships – keeping safe, recognise risks and how to report. How information and data is shared and used online.</p> <p>English:</p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>• To know that a website is a collection of pages that are all connected.</li> <li>• To know that websites usually have a homepage and subpages as well as clickable links to new pages, called hyperlinks.</li> <li>• To know that websites should be informative and interactive.</li> </ul> <p><b>Key vocabulary:</b> Google Sites, Content, Web page, Features, Record, Progress, Websites, Information, Audience, World Wide Web, Published, Hobby, Theme, Checklist, Web page, Collaboration, Web page, Features, Insert, Embed, Hyperlink</p>

		<ul style="list-style-type: none"> <li>Reading – comprehension. Discussions about books – taking turns and listening to what others say.</li> </ul> <p>English: Writing – composition. Organisational devices, learning from writing examples and peer assessment.</p>	
<p><b>Skills showcase:</b> HTML</p>	<p><b>Pupils will learn:</b> Editing the HTML and CSS of a web page to change the layout of a website and the text and images.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>Remixing existing code.</li> <li>Building a web page and creating content for it.</li> <li>Understanding that information found by searching the internet is not all grounded in fact.</li> </ul> <p>Recognising that information on the Internet might not be true or correct and that some sources are more trustworthy than others.</p>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>Introduction to HTML</li> <li>Remixing HTML</li> <li>Changing HTML and CSS</li> <li>Website hacking</li> <li>Replacing images</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>iPads</li> </ul> <p><b>Software needed:</b></p> <ul style="list-style-type: none"> <li>Trinket</li> </ul> <p><b>Cross-curricular links:</b> PSHE: Online Relationships – online friendships and the risks associated with strangers.</p> <p>English: Writing – Composition. Learning structure, vocabulary and grammar from similar examples. Using simple organisational devices.</p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>To understand and identify examples of HTML tags.</li> <li>To understand what changing the HTML and CSS does to alter the appearance of an object on the web.</li> <li>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.</li> <li>To know what “fake news” is and ways to spot websites that carry this type of misinformation.</li> <li>To know what the “inspect” elements tool is and ways of using it to explore and alter text and images.</li> </ul> <p><b>Key vocabulary:</b> HTML, Internet browser, Start tag, End tag, Paragraph, Webpage, Heading, Input, Output, Script, Code, CSS</p>
<p><b>Programming:</b> Computational thinking</p>	<p><b>Pupils will learn:</b> Plugged and unplugged activities to develop the four areas of computational thinking.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>What is computational thinking?</li> <li>Decomposition</li> <li>Abstraction and pattern recognition</li> <li>Algorithm design</li> <li>Applying computational thinking</li> </ul>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>To know that combining computational thinking skills can help you to solve a problem.</li> <li>To understand that pattern recognition means identifying</li> </ul>

	<ul style="list-style-type: none"> <li>Using decomposition to solve a problem by finding out what code was used.</li> <li>Using decomposition to understand the purpose of a script of code.</li> <li>Identifying patterns through unplugged activities.</li> <li>Using past experiences to help solve new problems.</li> <li>Using abstraction to identify the important parts when completing both plugged and unplugged activities.</li> <li>Creating algorithms for a specific purpose.</li> </ul> <p>Using abstraction and pattern recognition to modify code.</p>	<p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>iPads</li> <li>Prepare bead strings with repeated patterns</li> <li>Prepare a short dance or hand clap sequence – long enough that the children won't be able to easily follow it</li> <li>Plasticine (one per pair or small group)</li> <li>Dice</li> </ul> <p><b>Software needed:</b></p> <ul style="list-style-type: none"> <li>Scratch (website)</li> </ul> <p><b>Cross-curricular links:</b></p> <p>Maths: Solve problems involving multiplying and adding. 2-D shapes and 3-D shapes. Recognising angles.</p> <p>Physical Education: Perform dances using a range of movement patterns.</p> <p>English: Spoken Language – develop understanding through speculating, hypothesising, imagining and exploring ideas.</p>	<p>patterns to help them work out how the code works.</p> <ul style="list-style-type: none"> <li>To understand that algorithms can be used for a number of purposes e.g. animation, games design etc.</li> </ul> <p><b>Key vocabulary:</b> Computational thinking, Decomposition, Abstraction, Algorithm, Code, Input, Logical reasoning, Output, Pattern recognition, Script, Sequence, Variable</p>
<p><b>Data handling:</b> Investigating weather</p>	<p><b>Pupils will learn:</b> Researching and storing data using spreadsheets; designing a weather station that gathers and records data; learning how weather forecasts are made and using green screen technology to present a weather forecast.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>Using tablets or digital cameras to film a weather forecast.</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>What's the weather?</li> <li>Weather stations</li> <li>Extreme weather</li> <li>Satellites and forecasts</li> <li>Presenting forecasts</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>iPads</li> <li>Recycled materials, such as plastic packaging, bottles, cardboard packaging.</li> <li>Tape</li> </ul>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>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').</li> <li>To know that a weather machine is an automated machine that respond to sensor data.</li> <li>To understand that weather forecasters use specific language, expression and pre-prepared</li> </ul>

	<ul style="list-style-type: none"> <li>Understanding that weather stations use sensors to gather and record data which predicts the weather.</li> <li>Using keywords to effectively search for information on the internet.</li> <li>Searching the internet for data.</li> <li>Designing a device which gathers and records sensor data.</li> <li>Recording data in a spreadsheet independently.</li> <li>Sorting data in a spreadsheet to compare using the 'sort by...' option.</li> <li>Understanding that data is used to forecast weather.</li> </ul>	<ul style="list-style-type: none"> <li>Split pins, pipe cleaners</li> <li>Plastic or paper straws</li> </ul> <p><b>Software needed:</b></p> <ul style="list-style-type: none"> <li>Sketchpad</li> <li><a href="http://www.glitch.com/create">www.glitch.com/create</a></li> <li>Microsoft Excel</li> </ul> <p><b>Cross-curricular links:</b></p> <p>Science: Temperature, evaporation and condensation, water cycle, observations and accurate measurements.</p> <p>Geography: Physical geography including climate zones, biomes, vegetation belts, rivers, mountains, volcanoes and earthquakes. Maps, atlases, globes and digital/computer mapping. Counties and cities of the United Kingdom.</p> <p>Maths: Bar charts, pictograms, tables and other graphs.</p>	<p>scripts to help create weather forecast films.</p> <p><b>Key vocabulary:</b> Weather, Forecast, Solar panel, Cylinder, Pinwheel, Thermometer, Satellite, Cold, Warm, Rain, Wind, Temperature, Weather forecast, Collaboration, Temperature, Wind speed, Heat sensor, Satellite</p>
<p><b>Online safety:</b> Year 4</p>	<p><b>Pupils will learn:</b> Learning how to navigate the internet in an informed, safe and respectful way.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>Understanding why some results come before others when searching.</li> <li>Understanding that information found by searching the internet is not all grounded in fact.</li> <li>Learning to make judgements about the accuracy of online searches.</li> <li>Identifying forms of advertising online.</li> <li>Reflecting on the positives and negatives of time online.</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>What happens when I search online?</li> <li>How do companies encourage us to buy online?</li> <li>Fact, opinion or belief?</li> <li>What is a bot?</li> </ul> <p><b>Equipment and additional hardware needed:</b> n/a</p> <p><b>Software needed:</b> n/a</p> <p><b>Education for a Connected World:</b> Managing online information – search and accuracy, advertising, opinions and beliefs and AI. Health, well-being and lifestyle – technology as a distraction and time limits for technology.</p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>To understand some of the methods used to encourage people to buy things online.</li> <li>To understand that technology can be designed to act like or impersonate living things.</li> <li>To understand that technology can be a distraction and identify when someone might need to limit the amount of time spent using technology.</li> <li>To understand what behaviours are appropriate in order to stay safe and be respectful online.</li> </ul> <p><b>Key vocabulary:</b> Accuracy, Advantages, Advertisements, Belief, Bot, Chatbot, Computer,</p>

	<ul style="list-style-type: none"> <li>Identifying respectful and disrespectful online behaviour.</li> <li>Recognising that information on the Internet might not be true or correct and that some sources are more trustworthy than others.</li> </ul>		Distractions, Fact, Hashtag, Implications, In-app purchases, Influencer, Opinion, Program, Recommendations, Reliable, Risks, Screen time, Search results, Snippets, Sponsored, Trustworthy.
<p><b>Year 5 Online safety: Year 5</b></p>	<p><b>Pupils will learn:</b> What to do when they have concerns about content or contact online.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>Understand that passwords need to be strong and that apps require some form of passwords.</li> <li>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.</li> <li>Search for simple information about a person, such as their birthday or key life moments.</li> <li>Know what bullying is and that it can occur both online and in the real world.</li> <li>Recognise when health and wellbeing are being affected in either a positive or negative way through online use.</li> <li>Offer a couple of advice tips to combat the negative effects of online use.</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>Online protection</li> <li>Online communication</li> <li>Online reputation</li> <li>Online bullying</li> <li>Online health</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>iPads</li> <li>A3 poster paper</li> </ul> <p><b>Software needed:</b></p> <ul style="list-style-type: none"> <li>Microsoft Word</li> </ul> <p><b>Education for a Connected World:</b> Privacy and security; Health, well-being and lifestyle; Online relationships; Online bullying; and Online reputation.</p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>Identifying possible dangers online and learning how to stay safe.</li> <li>Evaluating the pros and cons of online communication.</li> <li>Recognising that information on the Internet might not be true or correct and learning ways of checking validity.</li> <li>Learning what to do if they experience bullying online.</li> <li>Learning to use an online community safely.</li> </ul> <p><b>Key vocabulary:</b> Safety, Acceptable behaviour, Unacceptable behaviour, Danger, Comfortable, Uncomfortable, Trolling, Social media, Cyberbullying, Script, Animation, Stop motion, Sound effects, Voice-over</p>
<p><b>Computing systems and networks: Search engines</b></p>	<p><b>Pupils will learn:</b> Using keywords and phrases, identifying inaccurate information, learning page rank works as well.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>Developing searching skills to help find relevant information on the internet.</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>Searching basics</li> <li>Inaccurate information</li> <li>Web quest</li> <li>Information poster</li> <li>Web crawlers</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>iPads</li> <li>Non-fiction texts</li> </ul>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>To know how search engines work.</li> <li>To understand that anyone can create a website and therefore we should take steps to check the validity of websites.</li> <li>To know that web crawlers are computer programs that crawl through the internet.</li> </ul>

	<ul style="list-style-type: none"> <li>• Learning how to use search engines effectively to find information, focussing on keyword searches and evaluating search returns.</li> <li>• Learn about different forms of communication that have developed with the use of technology.</li> <li>• Recognising that information on the Internet might not be true or correct and learning ways of checking validity.</li> </ul>	<ul style="list-style-type: none"> <li>• At least 15 of the following – pencils, erasers, whiteboards and rulers.</li> </ul> <p><b>Software needed:</b></p> <ul style="list-style-type: none"> <li>• Sketchpad</li> </ul> <p><b>Cross-curricular links:</b> PSHE: Online Relationships – online shared data, online friendships and the risks of strangers.</p> <p>English: Spoken Language – consider and evaluate different viewpoints, attending to and building on the contributions of others.</p>	<ul style="list-style-type: none"> <li>• To understand what copyright is.</li> </ul> <p><b>Key vocabulary:</b> Website, Search engine, Data leak, Privacy, Network, Real, Fake, Deceive, Information, Correct, Incorrect</p>
<p><b>Programming:</b> Music</p>	<p><b>Pupils will learn:</b> Applying programming skills to create sounds and melodies leading to a battle of the bands performance.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>• Predicting how software will work based on previous experience.</li> <li>• Writing more complex algorithms for a purpose.</li> <li>• Iterating and developing their programming as they work.</li> <li>• Confidently using loops in their programming.</li> <li>• Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected.</li> <li>• Writing code to create a desired effect.</li> <li>• Using a range of programming commands.</li> <li>• Using repetition within a program.</li> <li>• Amending code within a live scenario.</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Tinkering with Scratch music elements</li> <li>• Scratch soundtracks</li> <li>• Planning a soundtrack</li> <li>• Programming a soundtrack</li> <li>• Battle of the bands</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>• iPads</li> <li>• Headphones (optional)</li> <li>• Headphone splitters (optional)</li> <li>• A book that Year 5 group have been focusing on.</li> </ul> <p><b>Software needed:</b></p> <ul style="list-style-type: none"> <li>• Scratch (website)</li> </ul> <p><b>Cross-curricular links:</b> Music: To appreciate and understand a wide range of music. Play and perform in solo and ensemble contexts. Improvise and compose music for a range of purposes.</p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>• To know that a soundtrack is music for a film/video and that one way of composing these is on programming software.</li> <li>• To understand that using loops can make the process of writing music simpler and more effective.</li> <li>• To know how to adapt their music while performing.</li> </ul> <p><b>Key vocabulary:</b> Tinker, Predict, Programming, Music, Typing, Spacing, Performance, Coding, Tutorials, Error, Instructions, Debugging, Typo, Beat, Bugs, Decompose, Error, Loop, Melody, Mindmap, Output, Pitch, Programming, Repeat, Rhythm, Scratch, Soundtrack, Spacing, Tempo, Timbre, Tinker</p>

	<ul style="list-style-type: none"> <li>Using logical thinking to explore software more independently, making predictions based on their previous experience.</li> <li>Using a software programme (Scratch) to create music.</li> <li>Identify ways to improve and edit programs, videos, images etc.</li> </ul>	<p>English: Reading – identifying and discussing themes and convention. Making comparisons within and across books.</p>	
<p><b>Data handling:</b> Mars Rover 1</p>	<p><b>Pupils will learn:</b> Data transfer and binary code.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>Learning that external devices can be programmed by a separate computer.</li> <li>Recognising how the size of RAM affects the processing of data.</li> <li>Learning the vocabulary associated with data: data and transmit.</li> <li>Recognising that computers transfer data in binary and understanding simple binary addition.</li> <li>Relating binary signals (Boolean) to the simple character-based language, ASCII.</li> <li>Learning that messages can be sent by binary code, reading binary up to eight characters and carrying out binary calculations.</li> <li>Understanding how data is collected in remote or dangerous places.</li> <li>Understanding how data might be used to tell us about a location.</li> </ul> <p>Learn about different forms of communication that have developed with the use of technology.</p>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>Mars rover</li> <li>Binary code</li> <li>Computer architecture</li> <li>Using binary – numbers</li> <li>Using binary - text</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>iPads</li> </ul> <p><b>Software needed:</b> n/a</p> <p><b>Cross-curricular links:</b> Maths: Convert between different units of metric measure. Solve problems involving addition, subtraction, multiplication and division. Solve practical problems.</p> <p>Science: Describe the movement of the Earth and other planets relative to the sun in the solar system.</p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>To know that Mars Rover is a motor vehicle that collects data from space by taking photos and examining samples of rock.</li> <li>To know what numbers using binary code look like and be able to identify how messages can be sent in this format.</li> <li>To understand that RAM is Random Access Memory and acts as the computer's working memory.</li> <li>To know what simple operations can be used to calculate bit patterns.</li> </ul> <p><b>Key vocabulary:</b> Data, Space, Data transmission, Distance, Communicate, Design, Construction, Technology, Discovery, Planet, Scientist, Transmit, Internet, Research, Signal, Binary code, Numerical data, Sequence, 8-bit binary, Radio signal, Transmit</p>
<p><b>Programming:</b> Micro:bit</p>	<p><b>Pupils will learn:</b> The meaning and purpose of programming.</p>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>Tinkering with BBC micri;bit</li> </ul>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p>

	<p>Pupils will be given the opportunity to develop the following skills:</p> <ul style="list-style-type: none"> <li>Decomposing a program without support.</li> <li>Predicting how software will work based on previous experience.</li> <li>Writing more complex algorithms for a purpose.</li> <li>Programming an animation.</li> <li>Iterating and developing their programming as they work.</li> <li>Confidently using loops in their programming.</li> <li>Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected.</li> <li>Writing code to create a desired effect.</li> <li>Using a range of programming commands.</li> <li>Using repetition within a program.</li> <li>Using logical thinking to explore software more independently, making predictions based on their previous experience.</li> <li>Identify ways to improve and edit programs, videos, images etc.</li> </ul>	<ul style="list-style-type: none"> <li>Programming an animation</li> <li>Polling program</li> <li>Programming a pedometer</li> <li>Programming a scoreboard</li> </ul> <p>Equipment and additional hardware needed:</p> <ul style="list-style-type: none"> <li>iPads</li> <li>BBC micro:bits and battery packs</li> </ul> <p>Software needed:</p> <ul style="list-style-type: none"> <li><a href="http://makecode.microbit.org">makecode.microbit.org</a></li> </ul> <p>Cross-curricular links:</p> <p>English: Spoken Language – use spoken language to develop understanding through speculating, hypothesising, imagining and exploring ideas.</p>	<ul style="list-style-type: none"> <li>To know that a Micro:bit is a programmable device.</li> <li>To know that Micro:bit uses a block coding language similar to Scratch.</li> <li>To understand and recognise coding structures including variables.</li> <li>To know what techniques to use to create a program for a specific purpose (including decomposition).</li> </ul> <p>Key vocabulary: Tinkering, Device, Micro:bit, Webpage, Tablet, Pairing, App, Menu, Instructions, Screen, Wireless, Wifi, Bluetooth, Wires, Laptop, Desktop, Connection, USB, Download, Program, Coding, Internet, Animation, Input</p>
<p><b>Creating media: Stop motion</b></p>	<p>Pupils will learn: To create a stop motion animation.</p> <p>Pupils will be given the opportunity to develop the following skills:</p> <ul style="list-style-type: none"> <li>Decomposing animations into a series of images.</li> <li>Decomposing a story to be able to plan a program to tell a story.</li> <li>Using video editing software to animate.</li> </ul>	<p>Key activities in the unit of work are:</p> <ul style="list-style-type: none"> <li>Create a toy with simple images and a single movement.</li> <li>Create a short stop-motion animation with small changes between images.</li> <li>Think of a simple story idea for their animation and then decompose it into smaller parts to create a storyboard with simple characters.</li> <li>Make small changes to the models to ensure a smooth animation and delete unnecessary frames.</li> <li>Add effects such as extending parts and titles.</li> </ul>	<p>When assessed, pupils will demonstrate the following sticky knowledge:</p> <ul style="list-style-type: none"> <li>Decomposition of an idea is important when creating stop-motion animations.</li> <li>Stop-motion animation is filmed one frame at a time using models and with tiny changes between each photograph.</li> <li>Editing is an important feature of making and improving a stop-motion animation.</li> </ul> <p>Key vocabulary:</p>

		<ul style="list-style-type: none"> <li>• Provide helpful feedback to other groups about their animations.</li> </ul> <p>Equipment and additional hardware needed: Cameras</p> <p>Software needed: n/a</p> <p>Cross-curricular links: Art and design – develop techniques, including their control and their use of materials, with creativity and experimentation. Improve their mastery of art and design techniques, including drawing, painting and sculpture with a range of materials [for example, pencil, charcoal, paint, clay].</p>	<ul style="list-style-type: none"> <li>• animation</li> <li>• animator</li> <li>• background</li> <li>• character</li> <li>• decomposition</li> <li>• design</li> <li>• digital device</li> <li>• edit</li> <li>• evaluate</li> <li>• flipbook</li> <li>• fluid movement</li> <li>• frames</li> <li>• model</li> <li>• moving images</li> <li>• onion skinning</li> <li>• still images</li> <li>• stop motion</li> <li>• storyboard</li> <li>• thaumatrope</li> <li>• zoetrope</li> </ul>
<p><b>Skills showcase:</b> Mars Rover 2</p>	<p>Pupils will learn: 3D design skills</p> <p>Pupils will be given the opportunity to develop the following skills:</p> <ul style="list-style-type: none"> <li>• Learning the difference between ROM and RAM.</li> <li>• Recognising how the size of RAM affects the processing of data.</li> <li>• Understanding the fetch, decode, execute cycle.</li> <li>• Learning how the data for digital images can be compressed.</li> <li>• Recognising that computers transfer data in binary and understanding simple binary addition.</li> <li>• Understanding how bit patterns represent images as pixels.</li> <li>• Using logical thinking to explore software more independently,</li> </ul>	<p>Key activities in the unit of work are:</p> <ul style="list-style-type: none"> <li>• Pixels</li> <li>• Compressing images</li> <li>• Fetch, decode and execute</li> <li>• Tinkering with CAD</li> <li>• Tinker CAD tutorials</li> </ul> <p>Equipment and additional hardware needed:</p> <ul style="list-style-type: none"> <li>• iPads</li> <li>• Squared or graph paper – one per child</li> </ul> <p>Software needed:</p> <ul style="list-style-type: none"> <li>• Microsoft Excel</li> <li>• TinkerCAD</li> </ul> <p>Cross-curricular links: Art &amp; Design: Art and design techniques, including drawing, painting and sculpture.</p> <p>English:</p>	<p>When assessed, pupils will demonstrate the following sticky knowledge:</p> <ul style="list-style-type: none"> <li>• To understand that bit patterns represent images as pixels.</li> <li>• To understand that the data for digital images can be compressed.</li> <li>• To know the difference between ROM and RAM.</li> <li>• To understand various techniques that will improve the design of a 3D object (using CAD software).</li> </ul> <p>Key vocabulary: Binary code, Numerical data, Sequence, 8-bit binary, Transmit, Pixel, RAM, CAD</p>

	<p>making predictions based on their previous experience.</p> <ul style="list-style-type: none"> <li>Independently learning how to use 3D design software package TinkerCAD.</li> <li>Learn about different forms of communication that have developed with the use of technology.</li> </ul>	<p>Spoken Language – develop understanding through speculating, hypothesising, imagining and exploring ideas.</p> <p>PSHE: Online Relationships – online friendships, sources of information including an awareness of the risks of strangers.</p>	
<p><b>Year 6</b></p> <p><b>Computing systems and networks: Bletchley Park and the history of computers</b></p>	<p><b>Pupils will learn:</b> Exploring code-breaking at Bletchley Park, historical figures in a computer, the evolution of computers, designing a computer of the future and creating an audio advert.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>Learning about the history of computers and how they have evolved over time.</li> <li>Using past experiences to help solve new problems.</li> <li>Writing increasingly complex algorithms for a purpose.</li> <li>Debugging quickly and effectively to make a program more efficient.</li> <li>Remixing existing code to explore a problem.</li> <li>Changing a program to personalise it.</li> <li>Evaluating code to understand its purpose.</li> <li>Predicting code and adapting it to a chosen purpose.</li> <li>Using search and word processing skills to create a presentation.</li> <li>Understanding how search engines work.</li> <li>Using search engines safely and effectively.</li> <li>Understanding the importance of secure passwords and how to create them.</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>Explain that codes can be used for a number of different reasons and decode messages.</li> <li>Explain how to ensure a password is secure and how this works.</li> <li>Explain the importance of historical figures and their contribution towards computer science.</li> <li>Present information about their historical figures in an interesting and engaging manner.</li> <li>Develop an idea for a computer of the future and create a simple design.</li> <li>Produce a simple audio advert with simple edits, which demonstrate an understanding of how to use the software.</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>IPads</li> <li>Access to internal microphones or USB microphones for the computers you are using</li> <li>Provide headphones if possible</li> <li>Outdoor space or large hall for the start of the lesson</li> <li>Metre ruler</li> <li>Smartphone</li> <li>A micro SD card of around 8GB to compare hard disc sizes</li> </ul>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>The importance of having a secure password and what brute force hacking is.</li> <li>The first computers were created at Bletchley Park to crack the Enigma code to help the war effort in World War 2.</li> <li>About some of the historical figures that contributed to technological advances in computing.</li> <li>What techniques are required to create a presentation using appropriate software.</li> <li>Sound clips can be recorded using sound recording software.</li> <li>Sound clips can be edited and trimmed.</li> </ul> <p><b>Key vocabulary:</b></p> <ul style="list-style-type: none"> <li>acrostic code</li> <li>audio advert</li> <li>brute force hacking</li> <li>Caesar cipher</li> <li>chip and PIN system</li> <li>cipher</li> <li>combination</li> <li>date shift cipher</li> <li>discovery</li> <li>invention</li> <li>Nth letter cipher</li> </ul>

	<ul style="list-style-type: none"> <li>Using the understanding of historic computers to design a computer of the future.</li> <li>Planning, recording and editing an audio recording.</li> <li>Creating and editing sound recordings for a specific purpose.</li> </ul>	<p><b>Software needed:</b></p> <ul style="list-style-type: none"> <li>Microsoft forms</li> <li>Microsoft Word/PowerPoint</li> <li>Scratch (website)</li> </ul> <p><b>Cross-curricular links:</b></p> <p>History: Studying an aspect or theme in British history.</p> <p>Maths: Solving number and practical problems. Reading, writing, ordering and comparing numbers up to 10 000 000.</p> <p>PSHE: Knowing the rules and principles for keeping safe online and how to report them. How to critically consider online friendships and an awareness of the risks associated with strangers online.</p> <p>English: Writing – Composition. Identifying the audience and purpose. Noting and developing initial ideas. Using further organisational and presentational devices to structure text.</p>	<ul style="list-style-type: none"> <li>password</li> <li>pigpen cipher</li> <li>scrambled</li> <li>script</li> <li>secret</li> <li>secure</li> <li>technological advancement</li> <li>trial and error</li> </ul>
<p><b>Programming:</b> Intro to Python</p>	<p><b>Pupils will learn:</b> Using the programming language of Python.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>Decomposing a program into an algorithm.</li> <li>Writing increasingly complex algorithms for a purpose.</li> <li>Debugging quickly and effectively to make a program more efficient.</li> <li>Remixing existing code to explore a problem.</li> <li>Using and adapting nested loops.</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>Tinkering with Logo</li> <li>Nested loops</li> <li>Using Python</li> <li>Using loops in Python</li> <li>Coding Mondrian</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>iPads</li> </ul> <p><b>Software needed:</b></p> <ul style="list-style-type: none"> <li>Turtle academy</li> <li>Trinket</li> <li>Scratch (website)</li> </ul> <p><b>Cross-curricular links:</b></p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>To know that there are text-based programming languages such as Logo and Python.</li> <li>To know that nested loops are loops inside of loops.</li> <li>To understand the use of random numbers and remix Python code.</li> </ul> <p><b>Key vocabulary:</b> Loop, Code, Command, Patterns, Instructions, Instructions, Input, Import, remix, indentation, algorithm</p>

	<ul style="list-style-type: none"> <li>• Programming using the language Python.</li> <li>• Changing a program to personalise it.</li> <li>• Evaluating code to understand its purpose.</li> <li>• Using logical thinking to explore software independently, iterating ideas and testing continuously.</li> </ul>	<p>Maths: Compare and classify geometric shapes based on their properties and sizes. Describe positions on the full coordinate grid.</p> <p>Art: Improve their mastery of art and design techniques, including drawing, painting and sculpture and know about great artists, architects and designers in history.</p>	
<p><b>Data handling:</b> Big Data 1</p>	<p><b>Pupils will learn:</b> Barcodes, QR codes and RFID</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>• Understanding and identifying barcodes, QR codes and RFID.</li> <li>• Identifying devices and applications that can scan or read barcodes, QR codes and RFID.</li> <li>• Understanding how barcodes, QR codes and RFID work.</li> <li>• Gathering and analysing data in real time.</li> <li>• Creating formulas and sorting data within spreadsheets.</li> <li>• Learning how 'big data' can be used to solve a problem or improve efficiency.</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Barcodes</li> <li>• Transmitting data</li> <li>• RFID</li> <li>• Using RFID</li> <li>• Transport data</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>• iPads</li> <li>• Range of working remotes</li> </ul> <p><b>Software needed:</b></p> <ul style="list-style-type: none"> <li>• Microsoft Excel</li> </ul> <p><b>Cross-curricular links:</b> Science: To recognise that light appears to travel in straight lines.</p> <p>PSHE: Online Relationships – the rules and principles for keeping safe online and how to report. How information and data is shared and used online.</p> <p>Maths: Interpret and construct pie charts and line graphs and use these to solve problems. Complete, read and interpret information in tables.</p>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>• To know that data contained within barcodes and QR codes can be used by computers.</li> <li>• To know that infrared waves are a way of transmitting data.</li> <li>• To know that Radio Frequency Identification (RFID) is a more private way of transmitting data.</li> <li>• To know that data is often encrypted so that even if it is stolen it is not useful to the thief.</li> </ul> <p><b>Key vocabulary:</b> Barcode, QR code, QR scanner, RFID, Wireless, Chips, Encrypted, Infrared, Radio waves, Barcodes, QR codes, Privacy, Corrupted, Wireless, RFID, Infrared, Data, Stop motion, Bluetooth</p>
<p><b>Creating media:</b> Exploring AI</p>	<p><b>Pupils will learn:</b> Children write, record and edit radio plays set during WWII, look back in time at how computers have evolved and design a computer of the future.</p>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Explain what AI is and its basic functions.</li> </ul>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p>

	<p>Pupils will be given the opportunity to develop the following skills:</p> <ul style="list-style-type: none"> <li>• Identify different types of AI and their applications in everyday life.</li> <li>• Exploring text-based and image-based AI tools to understand how they generate content.</li> <li>• Applying coding skills like decomposition and pattern recognition to interact with AI applications.</li> <li>• Analysing the effectiveness of prompts and refining them for improved AI outputs.</li> <li>• Exploring ethical considerations around AI use and its impact on society.</li> </ul>	<ul style="list-style-type: none"> <li>• Identify real-life applications of AI that are commonly used in everyday life.</li> <li>• Identify how AI understands and processes text and image prompts.</li> <li>• Generate and refine prompts to achieve the best possible response from AI.</li> <li>• Identify how AI generates code and how it can be useful in web design.</li> <li>• Identify how AI can be a useful starting point for a project.</li> <li>• Explain the key ethical considerations of AI.</li> <li>• Debate the potential of AI replacing human roles, presenting well-structured arguments.</li> </ul> <p>Equipment and additional hardware needed:</p> <ul style="list-style-type: none"> <li>• computer</li> </ul> <p>Software needed:</p> <ul style="list-style-type: none"> <li>• n/a</li> </ul> <p>Cross-curricular links: English: Writing – Composition.</p>	<ul style="list-style-type: none"> <li>• AI is artificial intelligence and is used in everyday life.</li> <li>• AI is trained on data to recognise patterns and generate outputs.</li> <li>• AI can be used to generate written content.</li> <li>• AI can be used to create visual content like pictures.</li> <li>• AI can help generate basic HTML code to create the structure and layout of a website.</li> <li>• There are ethical issues surrounding AI, including data privacy, bias and responsible use.</li> </ul> <p><i>Key vocabulary:</i> AI, AI-generated image, AI-generated text, algorithm, applications, authenticity, code, considerations, debate, ethical, fake, generate, HTML, implications, instructions, modify, output prompt, refine, response, trained</p>
<p><b>Data Handling:</b> Big Data 2</p>	<p>Pupils will learn: Data usage and smart schools.</p> <p>Pupils will be given the opportunity to develop the following skills:</p> <ul style="list-style-type: none"> <li>• Understanding how corruption can happen within data during transfer (for example when downloading,</li> </ul>	<p>Key activities in the unit of work are:</p> <ul style="list-style-type: none"> <li>• Transferring data</li> <li>• Data usage</li> <li>• The Internet of Things</li> <li>• Designing a smart school</li> <li>• Designing a smart school presentation</li> </ul>	<p>When assessed, pupils will demonstrate the following sticky knowledge:</p> <ul style="list-style-type: none"> <li>• To know that data can become corrupted within a network but this is less likely to happen if it is sent in 'packets'.</li> </ul>

	<p>installing, copying and updating files).</p> <ul style="list-style-type: none"> <li>• Understanding that computer networks provide multiple services.</li> <li>• Using search and word processing skills to create a presentation.</li> <li>• Creating formulas and sorting data within spreadsheets.</li> <li>• Learning about the Internet of Things and how it has led to 'big data'.</li> <li>• Learning how 'big data' can be used to solve a problem or improve efficiency.</li> </ul>	<p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>• iPads</li> <li>• Access to an outdoor space, lines marked on the ground approximately ten meters apart.</li> <li>• One tennis racket between three pupils.</li> </ul> <p><b>Software needed:</b> n/a</p> <p><b>Cross-curricular links:</b> Physical Education: To take part in outdoor and adventurous activity challenges.</p> <p>Maths: To complete, read and interpret information in tables, including timetables.</p> <p>Design &amp; Technology: To use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose. Apply their understanding of computing to program, monitor and control their products.</p> <p>English: Spoken Language – participate in discussions, presentations, performances, role play, improvisations and debates.</p>	<ul style="list-style-type: none"> <li>• To know that devices or that are not updated are most vulnerable to hackers.</li> <li>• To know the difference between mobile data and WiFi.</li> </ul> <p><b>Key vocabulary:</b> Barcode, QR code, QR scanner, RFID, Wireless, Chips, Encrypted, Infrared, Radio waves, Barcodes, QR codes, Privacy, Corrupted, Wireless, RFID, Infrared, Data, Stop motion, Bluetooth</p>
<p><b>Skills showcase:</b> Inventing a product</p>	<p><b>Pupils will learn:</b> Designing a product, pupils: evaluate, adapt and debug code to make it suitable and efficient for their needs; use a software program to design their products; create their own websites and video adverts to promote their inventions.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>• Using past experiences to help solve new problems.</li> <li>• Writing increasingly complex algorithms for a purpose.</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Invention design</li> <li>• Coding and debugging</li> <li>• Computer Aided Design (CAD)</li> <li>• My product's website</li> <li>• Video advert</li> <li>• Persuasive advertisements</li> </ul> <p><b>Equipment and additional hardware needed:</b></p> <ul style="list-style-type: none"> <li>• iPads</li> <li>• BBC micro:bits and battery packs.</li> <li>• Micro USB cables if you're using laptops.</li> </ul>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>• To know what designing an electronic product involves.</li> <li>• To know which programming software/ language is best to achieve a purpose.</li> <li>• To know the building blocks of computational thinking e.g. sequence, selection, repetition, variables and inputs and outputs.</li> </ul> <p><b>Key vocabulary:</b></p>

	<ul style="list-style-type: none"> <li>• Debugging quickly and effectively to make a program more efficient.</li> <li>• Remixing existing code to explore a problem.</li> <li>• Changing a program to personalise it.</li> <li>• Evaluating code to understand its purpose.</li> <li>• Predicting code and adapting it to a chosen purpose.</li> <li>• Using logical thinking to explore software independently, iterating ideas and testing continuously.</li> <li>• Creating and editing videos, adding multiple elements: music, voiceover, sound, text and transitions.</li> <li>• Using design software TinkerCAD to design a product. Creating a website with embedded links and multiple pages.</li> <li>• Understanding how search engines work. Using search engines safely and effectively.</li> </ul>	<ul style="list-style-type: none"> <li>• If you have no access to BBC micro:bits then use the online emulator.</li> </ul> <p><b>Software needed:</b></p> <ul style="list-style-type: none"> <li>• BBC micro:bit</li> <li>• TinkerCAD</li> <li>• Microsoft Sway</li> <li>• WeVideo</li> </ul> <p><b>Cross-curricular links:</b> Design and Technology: To use research and develop design criteria to inform the design of innovative, functional, appealing products.; apply understanding of computing to program, monitor and control products; and generate, develop, model and communicate their ideas.</p> <p>English: Writing – Composition. Identifying audience and purpose and selecting appropriate grammar and vocabulary.</p>	<p>Adapt, Advert, Algorithm, Bugs, Coding, Debugging, Design, Edit, Electronic, Evaluate, Facts, Image rights, Images, Influence, Information, Inputs, Loops, Manipulation, Opinions, Output, Photos, Product, Program, Repetition, Screenshot, Search engine, Selection</p>
<p><b>Online safety:</b> Year 6</p>	<p><b>Pupils will learn:</b> Learning how to navigate the internet in an informed, safe and respectful way.</p> <p><b>Pupils will be given the opportunity to develop the following skills:</b></p> <ul style="list-style-type: none"> <li>• Learning about the positive and negative impacts of sharing online.</li> <li>• Learning strategies to create a positive online reputation.</li> <li>• Understanding the importance of secure passwords and how to create them.</li> <li>• Learning strategies to capture evidence of online bullying in order to seek help.</li> <li>• Recognising that updated software can help to prevent data corruption and hacking.</li> </ul>	<p><b>Key activities in the unit of work are:</b></p> <ul style="list-style-type: none"> <li>• Life online</li> <li>• Sharing online</li> <li>• Creating a positive online reputation</li> <li>• Capturing evidence</li> <li>• Password protection</li> <li>• Think before you click</li> </ul> <p><b>Equipment and additional hardware needed:</b> n/a</p> <p><b>Software needed:</b></p> <ul style="list-style-type: none"> <li>• Microsoft word</li> </ul> <p><b>Education for a Connected World:</b></p> <ul style="list-style-type: none"> <li>• Self-image and identity;</li> <li>• Online Reputation</li> <li>• Online Bullying</li> </ul>	<p><b>When assessed, pupils will demonstrate the following sticky knowledge:</b></p> <ul style="list-style-type: none"> <li>• To know that a digital footprint means the information that exists on the internet as a result of a person’s online activity.</li> <li>• To know what steps are required to capture bullying content as evidence.</li> <li>• To understand that it is important to manage personal passwords effectively.</li> <li>• To understand what it means to have a positive online reputation.</li> <li>• To know some common online scams.</li> </ul> <p><b>Key vocabulary:</b></p>

		<ul style="list-style-type: none"><li>• Online relationships</li><li>• Privacy and Security</li></ul>	Anonymity, Antivirus, Biometrics, Block and report, Consent, Copy, Digital footprint, Digital personality, Financial information, Hacking, Inappropriate, Malware, Online bullying, Online reputation, Password, Paste, Personal information, Personality, Phishing, Privacy settings, Private, Reliable source, Report, Reputation, Respect, Scammers, Screengrab
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