



**THE BRAMBLE
ACADEMY**

Computing at The Bramble Academy	
Substantive knowledge in Computing:	Substantive knowledge in Computing is understanding how to use technology, how to be safe and knowing how to program. This is developed through providing appropriate scaffolding, deliberate practice and by children applying their knowledge of how to be computational thinkers so that they know more, remember more and do more.
Disciplinary knowledge in Computing:	Disciplinary knowledge in computing is the use and interpretation of substantive knowledge in order to develop original digital content and programs.
Vocabulary:	The teaching of vocabulary is crucial to academic success for our children. Tier 2 and 3 vocabulary is mapped out throughout our curriculum to ensure vocabulary is both progressive and ambitious.

Sequence of Knowledge					
KS1 – Year 1					
Autumn		Spring		Summer	
<p>Computing systems and networks: Improving mouse skills</p>	<p>Programming 1: Algorithms unplugged</p>	<p>Skills showcase: Rocket to the moon</p>	<p>Programming 2: Bee-Bot</p>	<p>Creating media: Digital imagery</p>	<p>Data handling: Introduction to data</p>
<p>Use technology purposefully to create, organise, store, manipulate and retrieve digital content.</p> <p>Recognise common uses of information technology beyond school.</p> <p>Use technology safely and respectfully, keeping personal information private.</p>	<p>Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.</p> <p>Create and debug simple programs.</p> <p>Use logical reasoning to predict the behaviour of simple programs.</p>	<p>Use technology purposefully to create, organise, store, manipulate and retrieve digital content.</p> <p>Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.</p>	<p>Use logical reasoning to predict the behaviour of simple programs.</p> <p>Create and debug simple programs.</p> <p>Use technology purposefully to create, organise, store, manipulate and retrieve digital content.</p> <p>Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.</p>	<p>Use logical reasoning to predict the behaviour of simple programs.</p> <p>Use technology purposefully to create, organise, store, manipulate and retrieve digital content.</p> <p>Recognise common uses of Information technology beyond school.</p> <p>Identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.</p>	<p>Use technology purposefully to create, organise, store, manipulate and retrieve digital content.</p> <p>Recognise common uses of information technology beyond school.</p>
<p>Key concepts: Knowing how to log in and navigate around a computer, developing mouse skills, learning how to drag, drop, click and control a cursor to create works of art inspired by Kandinsky and self-portraits.</p>	<p>Key concepts: Using an unplugged approach so that algorithms, decomposition and debugging are made relatable to familiar contexts, such as dressing up and making a sandwich, while</p>	<p>Key concepts: 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>Key concepts: Developing early programming skills using either the Bee:Bot or virtual Bee:Bot.</p>	<p>Key concepts: Using creativity and imagination to plan a miniature adventure story and capturing it using developing photography skills. Children learn to enhance photos using a range of editing tools as well</p>	<p>Key concepts: Learning what data is and the different ways that it can be represented as well as developing an understanding of why data is useful, how it can be used and ways in which it can be gathered and recorded both by humans and computers.</p>



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<p>Week 1: Logging in Use computers more purposefully Log in and navigate around a computer Drag, drop, click and control a cursor using a mouse Use software tools to create art on the computer</p> <p>Week 2: To develop mouse skills Navigate a computer using a mouse. Understand what we mean by 'click' and 'drag'. Use the fill and stamp tools in Sketchpad.</p> <p>Week 3: Drawing shapes Click and drag objects to change their size or position. Use a mouse to carefully position shapes. Move shapes in front of or behind each other.</p> <p>Week 4: Drawing a story Identify the key parts of a story. Use drag and drop to move and resize images. Use a variety of tools to create different effects.</p> <p>Week 5: Self-portrait</p>	<p>learning why instructions need to be very specific.</p> <p>Week 1: To understand what an algorithm is. Explain that an algorithm is a set of instructions. Understand that these instructions sometimes need to be carried out in order. Understand there can be more than one way to solve a problem.</p> <p>Week 2: Algorithm pictures Explain why an algorithm must be clear and precise. Explain the problems a robot can have following our instructions.</p> <p>Week 3: Virtual assistants Identify some input devices. Identify some output devices. Identify some devices that are both input and output devices.</p> <p>Week 4: Step by step Explain what decomposition is. Understand how decomposition allows you to solve a problem more easily.</p>	<p>Week 1: Rocket materials Use a computer to create a list. Identify which materials are best for my rocket and describe their physical properties. Identify different types of digital content (words and pictures). Explain how a list made on a computer can be saved and shared more easily.</p> <p>Week 2: Rocket design Open a graphics editing program. Create a digital image using a graphics editor. Save a digital image to the correct folder.</p> <p>Week 3: Rocket building instructions Put a set of instructions in the right order. Identify the importance of instructions being in the right order. Know how to build a model rocket.</p> <p>Week 4: Making a rocket</p>	<p>Week 1: Getting to know Bee-Bot 'Tinker' with the buttons of a Bee-Bot to see what they do. Complete a cycle of predict, test and review.</p> <p>Week 2: Making a Bee-Bot video Create a video to explain how to use a Bee-Bot. Explain what the buttons on a Bee-Bot do. Show how the Bee-Bot moves when you press the different buttons.</p> <p>Week 3: Precise instructions Follow verbal instructions. Give precise instructions. Check that the instructions being given are correct.</p> <p>Week 4: Bee-Bot world Personalise my Bee-Bot world. Consider how the Bee-Bot can move from one place to another. Plan a Bee-Bot route. Program a Bee-Bot to follow my planned route.</p> <p>Week 5: Three little pigs</p>	<p>as searching for and adding other images to a project, resulting in a high-quality photo collage showcase.</p> <p>Week 1: Planning a photo story Explain what is happening in a pictorial story. Recognise the importance of sequencing. Plan my own pictorial story. Know that sequencing is important in Computing.</p> <p>Week 2: Taking photos Look at the screen and check what is in frame. Press the button carefully to ensure nothing changes. Ensure that my surroundings are bright enough. Identify that moving can create a blurred image.</p> <p>Week 3: Editing photos Explain that photos can be changed after they have been taken. Identify ways to improve my photo. Crop, resize and add a colour filter to my photo.</p> <p>Week 4: Searching for images Know images can be found online.</p>	<p>Week 1: Zoo data know that data can be shown in different ways. Represent data in different ways. Answer questions about the data using my representation.</p> <p>Week 2: Picture data Use a mouse. Type using a keyboard. Create a pictogram that shows animal data.</p> <p>Week 3: Minibeast hunt Identify different minibeasts. Record the number of different minibeasts I see. Represent this data digitally.</p> <p>Week 4: Animal branching database Identify and categorise different animals. Identify questions to sort data in the most efficient way. Create a branching database.</p> <p>Week 5: Inventions Recognise that computers understand different types of input. Design a computerised invention to gather data. Explain how my invention works.</p>
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<p>Identify different facial features. Use click and drag to create and layer shapes. Resize, move and change the order of shapes.</p>	<p>Explain how we use decomposition in our everyday lives.</p> <p>Week 5: Debugging directions Spot bugs in algorithms. Fix the error (debug it) and explain the problem it caused.</p>	<p>Build a rocket according to instructions. Take a clear photo of my finished rocket. Add text to evaluate it.</p> <p>Week 5: Rocket launching Measure distances accurately. Record data. Evaluate the success of my design.</p>	<p>Use programming to give the Bee-Bot clear instructions. Debug my instructions if they go wrong by identifying and correcting the mistake.</p>	<p>Think of a keyword to search with. Know what to do if I find something uncomfortable.</p> <p>Week 5: Photo collage Download the photos I want. Organise them on to the page. Resize and change the orientation of my images. Add numbers to show their order.</p>	
<p>Vocabulary: 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>Vocabulary: debug, decompose, decomposition, device, directions, input, instructions, manageable, motion, order, organise, output, precise, programming, problem, robot, sensor, sequence, solution, specific, steps, tasks, virtual assistant,</p>	<p>Vocabulary: designing, digital content, digital image, document, E-document, edit, editing program, evaluate, folder, input, instructions, log in, photo, program, order, robot, save, sequence, share, software, spreadsheet, table.</p>	<p>Vocabulary: algorithm, artificial intelligence, Bee-Bot, clear, code, debug, demonstration, filming, inputting, instructions, pause, precise, predict, program, tinker, video, video recording.</p>	<p>Vocabulary: Background, blurred, camera, clear, crop, delete, device, digital camera, download, drag and drop, edit, editing software, filter, image, import, internet, keyword, online, photograph, resize, save as, screen, search engine, sequence, software, storage space, visual effects.</p>	<p>Vocabulary: Compare, count, data, data collection Data record, data representation, edit, input, keyboard, line graph, mouse, information, label, pictogram, pie chart, process, record, resize, sort, table, tally, values.</p>
<p>Prior Learning:</p>	<p>Prior Learning:</p>	<p>Prior Learning:</p>	<p>Prior Learning:</p>	<p>Prior Learning:</p>	<p>Prior Learning:</p>

Sequence of Knowledge					
KS1 – Year 2					
Autumn		Spring		Summer	
Computing systems and networks 1: What is a computer?	Programming 1: Algorithms and debugging	Computing systems and networks 2: Word processing	Programming 2: ScratchJr	Creating media: Stop motion	Data handling: International Space Station
Use technology purposefully to create, organise, store, manipulate and retrieve digital content. Recognise common uses of information technology beyond school. Use logical reasoning to predict the behaviour of simple programs.	Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions. Create and debug simple programs. Use logical reasoning to predict the behaviour of simple programs.	Use technology purposefully to create, organise, store, manipulate and retrieve digital content. Use technology safely and respectfully, keeping personal information private. Recognise common uses of information technology beyond school.	Use logical reasoning to predict the behaviour of simple programs. Create and debug simple programs. Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.	Use technology purposefully to create, organise, store, manipulate and retrieve digital content. Recognise common uses of information technology beyond school. Use technology safely and respectfully, keeping personal information private.	Use technology purposefully to create, organise, store, manipulate and retrieve digital content.
Key concepts: Exploring what a computer is by identifying and learning how inputs and outputs work. Understanding how computers are used in the wider world, children design their own computerised invention. Week 1: Computer parts	Key concepts: Developing an understanding of what algorithms are, how to program them and how they can be developed to be more efficient through a range of unplugged and plugged-in activities. Week 1: Dinosaur algorithm	Key concepts: Learning about word processing and how to stay safe online as well developing touch-typing skills. Introducing important keyboard shortcuts, as well as simple editing tools within a word processor including bold, italics, underline and font colour as well as how to import images.	Key concepts: Exploring what 'blocks' do, using the app 'ScratchJr,' by carrying out an informative cycle of predict > test > review. Programming a familiar story and an animation of an animal, children make their own musical instrument by creating buttons and recording sounds as well as following an algorithm to record a joke. Week 1: Using ScratchJr	Key concepts: Storyboarding and simple animation creation using either tablet devices or devices with cameras. Week 1: What is animation?	Key concepts: Learning how astronauts survive on the ISS, including identifying necessary items, designing sensor displays, and exploring habitable planets. Children gain an understanding of living in space and how space exploration can benefit life on Earth. Week 1: Homes in space



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<p>Name the key parts of a computer. Explain the purpose of different computer parts. Explain that a keyboard contains lots of buttons.</p> <p>Week 2: Inputs Understand that people control technology. Understand that technology follows instructions. Predict what technology will do.</p> <p>Week 3: Technology safari Suggest what might have a computer inside. Explain why I think this. Suggest what the technology does.</p> <p>Week 4: Invention Include an input and output as part of my invention. Explain how it works, including how to control it. Label a design clearly.</p> <p>Week 5: Real-world role play Explain where computers are used. Suggest what their job is. Understand that computers work together.</p>	<p>Understand what the terms decomposition and algorithm mean. Decompose a game to predict algorithms. Plan algorithms for a more complex game.</p> <p>Week 2: Machine learning Explain what an algorithm is. Explain that computers use algorithms to make predictions. Write a clear and precise algorithm.</p> <p>Week 3: Through the maze Devise and create algorithms to solve problems. Include loops in algorithms (count controlled). Visualise directions from a 2D environment.</p> <p>Week 4: Making maps Explain what abstraction is. Give an example of when abstraction might be useful.</p> <p>Week 5: Unplugged debugging Understand the meaning of the word debugging. Listen to my peer's verbal instructions. Perform a task by following step-by-step instructions.</p>	<p>Week 1: Getting to know your keyboard Find keys on a computer keyboard. Type capital letters using 'shift'. Identify that the keyboard is an important input device.</p> <p>Week 2: Getting started with word processing Type a sentence into a word processor. Select text and make it bold or italic. Explain how to make other changes to a document.</p> <p>Week 3: Newspaper writer Use keyboard shortcuts to alter text. Search for and find an appropriate image. Import and alter an image in a document.</p> <p>Week 4: Poetry book Use text styles to create headings and subtitles. Copy and paste text into a document. Identify the importance of crediting source materials.</p> <p>Week 5: Digital writer Use keyboard shortcuts. Use different text styles.</p>	<p>Predict what something new will do. Explore something independently. Explain what I found using ScratchJr.</p> <p>Week 2: Creating an animation Use the programming blocks for a purpose. Recognise a loop in programming. Think about how animals move. Use programming skills to represent an animal moving.</p> <p>Week 3: Making a musical instrument Design a musical instrument. Program code to run 'on tap'. Select appropriate blocks for purpose.</p> <p>Week 4: Programming a joke Use an algorithm to help with programming. Sequence the blocks appropriately. Explain what each block in the program does.</p> <p>Week 5: The '3 little pigs' algorithm Explain what an algorithm is. Choose the code to match my algorithm.</p>	<p>Understand and explain what animation means. Understand how to create a short animation using a flip book. Talk about how animation began.</p> <p>Week 2: What is stop motion? Explain what 'stop motion' means. Understand how to create a short animation using animation software. Understand what 'onion skinning' is and how animators use it. Use onion skinning to make small changes to an object to make the animation smooth.</p> <p>Week 3: My first animation Understand how to create a short animation using Stop Motion Studio. Use onion skinning to make small changes to an object to make the animation smoother.</p> <p>Week 4: Planning my project Work collaboratively with others to plan an animation. Think carefully about keeping an idea simple and easy to animate. Decompose a story into smaller parts.</p>	<p>Consider human survival needs. Retrieve digital content from an interactive map. Consider how a computer is used to monitor data relating to human survival needs.</p> <p>Week 2: Space bag Know the items that astronauts need to survive in the habitat of the ISS. Use mouse and keyboard skills to draw and add text to a project. Identify the importance of exercise, eating healthily and staying clean. Consider how computers would monitor items on the ISS.</p> <p>Week 3: Warmer, colder Read temperatures using a thermometer. Understand that sensors monitor the ISS to make sure the astronauts are safe and healthy. Design a display to show the data that the sensors collect.</p> <p>Week 4: Experiments in space Know what plants need to grow. Create an algorithm for growing a plant. Explain how space exploration benefits human life on Earth.</p> <p>Week 5: Goldilocks planets Know that water is very important to life on Earth. Interpret data.</p>
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		<p>Import and alter an image in a document. Evaluate my writing.</p>	<p>Use an algorithm to write a computer program.</p>	<p>Week 5: Creating my project Use a planning sheet to structure my animation. Work collaboratively. Create an animation of at least 10 frames.</p>	<p>Identify temperatures within a range to decide if they are a Goldilocks planet.</p>
<p>Vocabulary: computer, desktop, device, digital, digital recorder, electricity, function, input, invention, keyboard, laptop, monitor, mouse, output, paying till, scanner, screen, system, tablet, technology, video, wires.</p>	<p>Vocabulary: abstraction, algorithm, artificial, intelligence, bug, clear, correct, data, debug, decompose, error, key features, loop, predict, unnecessary.</p>	<p>Vocabulary: backspace, bold, copy, copyright, cut, delete, forward button, highlight, home row, home screen, image, import, italics, keyboard, keyboard character, keyboard shortcut, keyword, layout, navigate, paste, redo, search, space bar, text, text effects, touch typing, underline, undo, word processing.</p>	<p>Vocabulary: algorithm, animation, blocks, bug, button, CGI, computer code, code, debug, fluid, icon, imitate, instructions, loop, 'on tap', programming, repeat, ScratchJr, sequence, sound recording.</p>	<p>Vocabulary: animation, background, decompose, digital device, drawing, flipbook, frames, moving images, object, onion skinning, plan, still images.</p>	<p>Vocabulary: 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>Prior Learning:</p>	<p>Prior Learning:</p>	<p>Prior Learning:</p>	<p>Prior Learning:</p>	<p>Prior Learning:</p>	<p>Prior Learning:</p>



Sequence of Knowledge

KS2 – Year 3

Autumn		Spring		Summer	
Computing systems and networks 1: Networks	Programming: Scratch	Computing systems and networks 2: Emailing	Computing systems and networks 3: Journey inside a computer	Creating media: Video trailers	Data handling: Comparison cards databases
<p>Understand computer networks, including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration.</p> <p>Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.</p>	<p>Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.</p> <p>Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.</p> <p>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.</p>	<p>Understand computer networks including the internet; how they can provide multiple services, such as the world wide web, and the opportunities they offer for communication and collaboration.</p> <p>Use technology safely, respectfully and responsibly.</p>	<p>Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.</p> <p>Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.</p> <p>Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.</p>	<p>Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.</p> <p>Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.</p> <p>Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.</p> <p>Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p> <p>Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems</p>	<p>Understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration.</p> <p>Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.</p> <p>Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.</p> <p>Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.</p>



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				by decomposing them into smaller parts.	
<p>Key concepts: Introduction to the concept of networks, learning how devices communicate. From identifying components, learn how information is shared and deepen this understanding by exploring examples of real-world networks.</p> <p>Week 1: What is a network? Understand the purpose of a network. Name the key parts of a network. Explain the difference between a wired and wireless connection. Identify which components can be connected.</p> <p>Week 2: A file's journey Understand the journey of a file. Explain parts of a network. Identify real-world networks.</p> <p>Week 3: How a website works Recognise that the internet is a network. Identify the parts of a network needed for a website to work. Understand the role of the cloud.</p> <p>Week 4: Routers Recognise the role that a router plays in a network. Give examples of how a router is used. Explain what a router does.</p>	<p>Key concepts: Building on the use of the 'ScratchJr' application in Year 2, progressing to using the more advanced application called 'Scratch', learning to use repetition or 'loops' and building upon skills to program an animation, a story and a game.</p> <p>Week 1: Tinkering with Scratch Know that Scratch is a coding application. Predict what different code will do. Explore an application independently.</p> <p>Week 2: Using loops Understand and explain what a loop is. Recognise when a loop is used. Know how to choose an appropriate loop.</p> <p>Week 3: Making an animation Know how to decompose a project. Know how to remix a project. Select the correct blocks to achieve my goals.</p> <p>Week 4: Storytelling Choose appropriate blocks. Continue someone else's program.</p>	<p>Key concepts: Learning how to send and edit emails, add attachments and how to be a responsible digital citizen by thinking about the contents of what is sent.</p> <p>Week 1: Communicating with technology Discuss early methods of communication. Identify which method of communication suits each purpose. Explain what an email is.</p> <p>Week 2: Sending an email Log in and log out of an email account. Write an email. Recall that emails can be used to send information around the world.</p> <p>Week 3: Adding attachments Log into my email account. Send an email with an attachment.</p> <p>Week 4: Be kind online Use positive language within an email. Recognise when online behaviour is unkind.</p>	<p>Key concepts: 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>Week 1: Inputs and outputs Identify some inputs and outputs. Recall that a computer follows instructions. Explain what the computer is doing.</p> <p>Week 2: Building a paper laptop Suggest a laptop's inputs and outputs. Recall that a laptop is made up of many parts. Use logic to explain the purpose of some parts.</p> <p>Week 3: Following instructions Explain that a computer is made up of many parts. Suggest the purpose of each part. Follow an algorithm.</p> <p>Week 4: Computer memory Explain that a computer is made up of many parts. Suggest the purpose of each part. Use a QR code.</p> <p>Week 5: Dismantling a tablet</p>	<p>Key concepts: Developing filming and editing video skills through the storyboarding and creation of book trailers.</p> <p>Week 1: Planning a book trailer Describe the purpose of a book trailer. Identify the key events in a story. Plan a book trailer.</p> <p>Week 2: Filming Frame shots differently to create various effects. Use digital devices to record video or take photos.</p> <p>Week 3: Editing the trailer Import videos and photos into film editing software. Record sounds using digital devices. Add sound effects and music to a video.</p> <p>Week 4: Transitions and text Add text to a video. Understand what transitions are in film. Incorporate different transitions in a video.</p> <p>Week 5: Video review</p>	<p>Key concepts: Using the theme of a 'Comparison card game' to understand what a database is. Learning the meanings of records, fields and data. Further exploration will lead to the development of the ideas of sorting and filtering.</p> <p>Week 1: Records, fields and data Know what field, record and data mean. Compare numbers. Scan a record for relevant information.</p> <p>Week 2: Race against the computer Understand what a paper database is and can name examples. Understand what a computerised database is. Compare the advantages and disadvantages of paper and computerised databases.</p> <p>Week 3: Sorting and filtering Input data into a database. Know how to sort data. I can filter data by a particular value. Create questions that can be answered using information from a database. Interpret information.</p> <p>Week 4: Representing data Create a graph and chart in Google Sheets. Name different types of charts. Understand the purpose of visual representations of data.</p>



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<p>Week 5: What is packet data? Recognise that data is transferred across the internet. Explain that routers connect to send information. Demonstrate that data can be too big to send whole.</p>	<p>Debug my own program.</p> <p>Week 5: Programming a game Explain the purpose of an algorithm. Decompose a problem. Use an algorithm to code a program.</p>	<p>Understand how to be a responsible digital citizen.</p> <p>Week 5: Fake emails Recognise when an email might be fake. Know not to click on links in an email unless I know what it is. Identify what to do if I suspect an email is fake.</p>	<p>Know that a tablet is a computer. Compare similarities and differences across different types of computers. Use logic to suggest what's inside a computer.</p>	<p>Explain what makes a successful video. Know what makes a successful book trailer. Think about how to share book recommendations.</p>	<p>Week 5: Planning a holiday Understand that databases are used for different purposes. Know how to sort and filter data. Explain what information is useful in an online database.</p>
<p>Vocabulary: device, file, internet, network, network, switch, packet data, router, server, the cloud, user, WiFi, wired, wireless, wireless access point.</p>	<p>Vocabulary: algorithm, animation, application, code, code block, debug, decompose, game, interface, loop, predict, program, remixing code, repetition code, review, Scratch, sprite, tinker.</p>	<p>Vocabulary: attachment, Bcc (Blind carbon copy), Cc (Carbon copy), compose, content, cyberbullying, document, domain, download, email, email account, email address, emoji, emotions, fake, font, genuine, hacker, icons, inbox, information, link, log in, log out, negative, language, password, personal information.</p>	<p>Vocabulary: algorithm, assemble, CPU (central processing unit), data, decompose, desktop, disassemble, GPU (graphics processing unit), hard drive, HDD (hard disk drive), infinite loop, input, keyboard, laptop, memory, microphone, monitor, mouse, output, photocopier, program, QR Cod, RAM (random access memory), ROM (read only memory), storage, tablet device, technology, touchscreen, touchpad.</p>	<p>Vocabulary: application, camera angle, clip, cross blur, cross fade, cross zoom, desktop, digital device, dip to black, directional wipe, edit, film, film editing software, graphics, import, key events, laptop, music, photo, plan, recording, sound effects, storyboard, time code, trailer, transition, video, voiceovers</p>	<p>Vocabulary: categorise, category, chart, data, database, excel, fields, filter, graph, information, interpret, PDF, questionnaire, record, representation, sort, spreadsheet.</p>
<p>Prior Learning:</p>	<p>Prior Learning:</p>	<p>Prior Learning:</p>	<p>Prior Learning:</p>	<p>Prior Learning:</p>	<p>Prior Learning:</p>

Sequence of Knowledge

KS2 – Year 4

Autumn		Spring		Summer	
Computing systems and networks: Collaborative learning	Programming 1: Further coding with Scratch	Creating media: Website design	Skills showcase: HTML	Programming 2: Computational thinking	Data handling: Investigating weather
<p>Understand the need to be thoughtful when working on a collaborative document.</p> <p>Use comments to suggest changes to a document and understand how to resolve comments.</p> <p>Use a variety of different slide styles to convey information including images and transitions.</p> <p>Create a Google Form with a range of different questions types that will provide different types of answers, e.g. text, multiple choice or numerical values.</p> <p>Export data to a spreadsheet, highlighting data, using conditional formatting and calculating averages and sums of numbers.</p>	<p>Understand how to create a simple script in Scratch.</p> <p>Add or change a sprite and prevent it from rotating.</p> <p>Use decomposition to identify key features and understand how to decipher actions that make the quiz game work.</p> <p>Understand what a variable is and how to use the 'say' and 'ask' blocks.</p> <p>Create a variable and be able to use a variable to record a score.</p> <p>Understand what a variable is and how it works within a program.</p>	<p>Use most of the tabs (e.g. insert, pages, themes) on Google Sites on their website.</p> <p>Create a clear plan for their web page and begin to create it.</p> <p>Create a professional looking web page with useful information and a clear style, which is easy for the user to read and find information from.</p> <p>Create a clear plan by referring back to their checklist.</p> <p>Create four web pages with a range of features on their website.</p>	<p>Recognise the role of HTML in a web page.</p> <p>Add text between the heading and paragraph tags.</p> <p>Explore a web page using the inspect tool.</p> <p>Explain how they altered the HTML to create their posters.</p> <p>Alter the basic elements within a web page using the inspect tool.</p> <p>Replace the text and images in a webpage.</p>	<p>Understand that problems can be solved more easily using computational thinking.</p> <p>Understand what the different code blocks do and create a simple game.</p> <p>Understand the terms pattern recognition and abstraction and how they help to solve a problem.</p> <p>Create a Scratch program which draws a square and at least one other shape.</p> <p>Understand how computational thinking can help to solve problems and apply computational thinking to problems they face.</p>	<p>Search the web efficiently to find temperatures of different cities and record this accurately.</p> <p>Design a weather station that gathers and records sensor data, explaining how it works and the units of measurement it would use.</p> <p>Design an automated machine that uses selection to respond to sensor data.</p> <p>Search for and record weather forecast information in a spreadsheet and explain how this data is collected.</p> <p>Create a video which includes weather forecast information.</p>
<p>Key concepts: Working collaboratively in a responsible and considerate way as well as looking at a range of collaborative tools.</p>	<p>Key concepts: Learning the basics of programming in Scratch, children will create a simple script, use</p>	<p>Key concepts: Developing their research, word processing, and collaborative working skills whilst learning how web pages and web sites are</p>	<p>Key concepts: Editing the HTML of a web page to change the layout of a website and the text and images.</p>	<p>Key concepts: Developing the four areas of computational thinking through a range of plugged and unplugged activities.</p>	<p>Key concepts: Researching and storing data using spreadsheets, designing a weather station which gathers and records data and learning how weather forecasts are made.</p>



THE BRAMBLE ACADEMY

<p>Week 1: Teamwork Understand how to work with a partner without being in the same room. Contribute to teamwork sensibly and responsibly. Recognise what behaviour is appropriate when collaborating online.</p> <p>Week 2: Sharing a document Share my work with other people and access documents shared with me. Understand that it is important to be positive and supportive of my classmates. Collaborative word processing software to make suggestions or comments on someone else's work.</p> <p>Week 3: Slide presentations Understand how to use presentation software. Include images and text in my slides. Use transitions and animations to make my slides more interesting.</p> <p>Week 4: Google forms Understand how to create a Google Form. Understand why a survey might be useful. Share a form with my class.</p> <p>Week 5: Share spreadsheets Export data to a spreadsheet.</p>	<p>decomposition and understand what variables are.</p> <p>Week 1: Scratch reminders Name the main areas of Scratch. Recognise how to adjust my sprite's orientation in Scratch. Create a simple script for a new sprite to my stage.</p> <p>Week 2: Identifying what code does Recognise that a sprite may contain more than one script. Identify the parts of a Scratch game. Explain the term 'decomposition'.</p> <p>Week 3: Introduction to variables Use the 'ask' block in Scratch. Understand what variable means. Create a variable in Scratch to store an answer.</p> <p>Week 4: Making a variable Create a variable and use it to store information. 'Call' a variable within my program. Recognise that variables can be words or numbers.</p> <p>Week 5: Times tables project Create a range of questions. Use the 'if/else' block to check whether an answer is correct. Use the 'score' variable to calculate the total number of correct answers.</p>	<p>created, exploring how to change layouts, embed images and videos and link between pages.</p> <p>Week 1: Getting to know Google sites Create a webpage using Google Sites. Add content to a webpage. Use a range of features in Google Sites and record my progress.</p> <p>Week 2: Book review webpage Plan the content for my webpage. Use different features on Google sites. Work collaboratively.</p> <p>Week 3: Creating a webpage Build a webpage. Include many features of Google Sites. Make my page informative and interactive.</p> <p>Week 4: Planning my website Plan a website in detail, considering the Google Sites features that I will include. Start to build a website based on my designs. Consider information that other people would find useful and interesting.</p> <p>Week 5: Creating my website Build a website with four web pages. Use a range of features on Google Sites. Evaluate a website.</p>	<p>Week 1: What is HTML? Identify that some web pages are built using HTML. Make real-life connections by identifying how HTML is used in familiar websites. Identify some HTML tags</p> <p>Week 2: Remixing HTML Identify HTML tags. Describe the purpose of some HTML tags. Remix some parts of HTML code.</p> <p>Week 3: HTML unplugged Translate HTML into text and images. Identify HTML tags. Explain how the HTML works.</p> <p>Week 4: Website hacking Use the inspect tool to alter content on a web page. Recognise that the changes I have made to a web page are not permanent. Identify a fake news story.</p> <p>Week 5: Replacing images Use the inspect tool. Alter the content in the tag. Use images that are permitted for reuse.</p>	<p>Week 1: What is computational thinking? Identify the four strands that make up computational thinking. Recall that problems can be made easier if I use computational thinking.</p> <p>Week 2: Decomposition Decompose a problem. Use decomposition to figure out what Scratch code does. Decompose a problem to figure out which code blocks might have been used.</p> <p>Week 3: Abstraction and pattern recognition Know how to recognise patterns. Use past experiences to understand how to solve new problems. Understand how to abstract key information.</p> <p>Week 4: Algorithm design Create an algorithm for drawing a square. Use my algorithm to write a script using Scratch. Use pattern recognition to modify my script to draw different shapes</p> <p>Week 5: Applying computational thinking Identify which computational thinking skill to apply. Select a skill to help me solve a problem.</p>	<p>Children use tablets or digital cameras to present a weather forecast.</p> <p>Week 1: What is the weather? Recognise what the weather is and what can affect it. Recognise the importance of data in weather forecasting. Search the internet for weather data. Record this data in a spreadsheet.</p> <p>Week 2: Weather stations Understand what sensor data is. Know different units of measurement. Design a device to sense and record the weather.</p> <p>Week 3: Extreme weather Know that sensor data can be used to help predict extreme weather. Use keywords to effectively search for information on the Internet. Write an algorithm for an automated machine which uses selection.</p> <p>Week 4: Satellites and forecasts Recognise how weather is predicted. Use search engines to find information. Record data in a spreadsheet.</p> <p>Week 5: Presenting forecasts Recognise what information is included in a weather forecast. Write a short script for a weather forecast. Create a short video.</p>
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THE BRAMBLE ACADEMY

<p>Highlight data using conditional formatting. Use a spreadsheet to calculate averages and sums of numbers.</p>	<p>Make my quiz engaging and exciting.</p>			<p>Work with a partner and discuss how to solve a problem</p>	
<p>Vocabulary: animations, average, bar chart, collaboration, comment, contribution, data, edited, email account, format, freeze, icon, images, insert, link, multiple choice, numerical data, pie chart, presentations, resolved, reviewing comments, share, slides, software, spreadsheets, suggestions, survey, teamwork, themes, transitions</p>	<p>Vocabulary: code block, conditional statement, coordinate, decompose, feature, information, negative number, orientation, position, program, project, script, sprite, stage, tinker, variable</p>	<p>Vocabulary: Assessment, audience, checklist, collaboration, content, contribution, create, design, embed, evaluate, features, Google Sites, hobby, homepage, hyperlinks, images, insert, online, plan, progress, published, record, review, style, subpage, tab, theme, web page, website, World Wide Web</p>	<p>Vocabulary: code, content, copyright, CSS, end tag, fake news, hacker, heading, HTML, HTML tags, internet, browser, paragraph, remixing, start tag, text, unplugged, URL, web page, web page elements</p>	<p>Vocabulary: application, camera angle, clip, cross blur, cross fade, cross zoom, desktop, digital device, dip to black, directional wipe, edit, film, film editing software, graphics, import, key events, laptop, music, photo, plan, recording, sound effects, storyboard, time code, trailer, transition, video, voiceovers</p>	<p>Vocabulary: Cylinder, degree Celsius, evaporation, extreme weather, filming, forecast, heat sensor, lightning, measurement, pinwheel, presenter, rain, satellite, script, sensor data, solar panel, temperature, thermometer, tornado, weather, weather forecast, wind speed</p>
<p>Prior Learning:</p>	<p>Prior Learning:</p>	<p>Prior Learning:</p>	<p>Prior Learning:</p>	<p>Prior Learning:</p>	<p>Prior Learning:</p>

Sequence of Knowledge

KS2 – Years 5-6

Autumn		Spring		Summer	
Computing systems and networks: Search engines	Programming 1: Music	Data handling: Mars Rover 1	Programming 2: Micro:bit	Creating media: Stop motion animation	Skills showcase: Mars Rover 2
<p>Developing searching skills to help find relevant information on the internet.</p> <p>Learning how to use search engines effectively to find information, focus on keyword searches and evaluate search returns.</p> <p>Learn about different forms of communication that have developed with the use of technology.</p> <p>Recognising that information on the Internet might not be true or correct and learning ways of checking validity.</p>	<p>Understanding that a soundtrack is music for a film/video and that one way of composing these is on programming software.</p> <p>Recognising that loops can make the process of writing music simpler and more effective.</p> <p>Knowing how to adapt their music while performing</p>	<p>Identify some types of data the Mars Rover could collect (for example, photos).</p> <p>Explain how the Mars Rover transmits the data back to Earth and the challenges involved.</p> <p>Read any number in binary, up to eight bits.</p> <p>Identify input, processing and output on the Mars Rovers.</p> <p>Read binary numbers and grasp the concept of binary addition.</p> <p>Relate binary signals (Boolean) to a simple character-based language, ASCII.</p>	<p>Clip blocks together and predict what will happen. Make connections with previous programming interfaces they've used, e.g. Scratch.</p> <p>Create their own images to make the animation and recognise the difference between 'on start' and 'forever'.</p> <p>Recognise blocks they've used previously, identifying inputs and outputs used and make predictions about how variables work.</p> <p>Choose appropriate blocks to complete the program and attempt the challenges independently.</p> <p>Break a program down into smaller steps, suggesting appropriate blocks and match the algorithm to the program.</p>	<p>Create a toy with simple images and a single movement.</p> <p>Create a short stop motion with small changes between images.</p> <p>Think of a simple story idea for their animation and then decompose it into smaller parts to create a storyboard with simple characters.</p> <p>Make small changes to the models to ensure a smooth animation and delete unnecessary frames.</p> <p>Add effects such as extending parts and titles.</p> <p>Provide helpful feedback to other groups about their animations.</p>	<p>Create a pixel picture, explaining that a pixel is the smallest element of a digital image and that binary is used to code and transfer this data.</p> <p>Save a JPEG as a bitmap and recognise the difference in file size as well as explaining how pixels are used to transfer image data.</p> <p>Explain the 'fetch, decode, execute' cycle in relation to real-world situations.</p> <p>Create a profile with a safe and suitable username and password and begin to use 3D design tools.</p> <p>Independently take tutorial lessons, applying what they have learnt to their design and understand the importance of using an online community responsibly.</p>



THE BRAMBLE ACADEMY

<p>Key concepts: Understanding how search engines work and developing searching skills to find relevant and accurate information online.</p> <p>Week 1: Searching basics Explain what a search engine is. Use a search engine to navigate the web. Suggest keywords for searching.</p> <p>Week 2: Inaccurate information Recognise that not everything online is true. Understand anyone can create a website. Suggest ways of checking validity.</p> <p>Week 3: Web quest Understand the importance of keywords. Use the acronym TASK. Use my search skills to answer focused questions.</p> <p>Week 4: Information poster Include a title and at least five facts. Choose appropriate pictures, colours and designs. Consider fair use. Credit people for information, images and videos I use.</p> <p>Week 5: Web crawlers Understand the role of a web index. Explain what web crawlers are. Discuss page rank.</p>	<p>Key concepts: Applying programming skills to create sounds and melodies leading to a battle of the bands performance.</p> <p>Week 1: Tinkering with Scratch music elements Identify that Scratch is a coding application with music elements. Predict what I think different code blocks will do. Explore Scratch independently. Explain what I found from tinkering.</p> <p>Week 2: Scratch soundtracks Use Scratch's basic sound commands. Include a loop in my program. Debug simple errors in my code.</p> <p>Week 3: Planning a soundtrack Decompose a story. Plan my program by tinkering. Explain how my program will add to the story.</p> <p>Week 4: Programming a soundtrack Work from a plan. Use a range of programming commands. Explain how my program enhances the scene.</p> <p>Week 5: Battle of the Bands Combine known commands. Code music with a purpose. Use repetition in a program.</p>	<p>Key concepts: Identifying some of the types of data that the Mars Rover collects and explaining how the Mars Rover transmits the data back to Earth. Children will read binary numbers, and understand binary addition as well as identifying input, processing and output on the Mars Rovers.</p> <p>Week 1: Mars Rover Recall the meanings of the words data and transmit. Identify a type of data that the Mars Rover may transmit back to Earth. Identify the challenges of transmitting data over large distances. Explain why data is being collected from the Mars Rover.</p> <p>Week 2: Binary code Identify binary as the most basic way that computers communicate. Read binary numbers up to eight characters. Recall that each number (one or zero) is referred to as a bit. Calculate binary numbers, knowing each digit is worth double the one that precedes it.</p> <p>Week 3: Computer architecture Identify sensors. Identify the difference between computer input and output.</p>	<p>Key concepts: Clipping blocks together in a program and predicting what will happen while making connections with previously used programming interfaces. Children create animations, recognise inputs/outputs, choose appropriate blocks, and break programs down into smaller steps.</p> <p>Week 1: Tinkering with BBC:microbot Predict what I think something new will do. Explore something independently. Explain what I found.</p> <p>Week 2: Programming and animation Decompose an animation into a series of images. Explain the difference between 'on start' and 'forever' blocks. Choose the blocks I need for my program.</p> <p>Week 3: Polling program Identify some code blocks. Predict what a block or program does. Explain how and why a program works.</p> <p>Week 4: Programming a pedometer Recognise code blocks. Decompose a program. Debug a program.</p>	<p>Key concepts: Storyboarding ideas, taking photographs and editing to create a video animation.</p> <p>Week 1: Animation explored Understand and explain what animation means. Explain the history of animation. Create my own 19th century animation toy.</p> <p>Week 2: Exploring stop-motion Explain what stop motion is. Create a short animation. Recognise what onion skinning is. Make small changes to my object to make my animation smoother.</p> <p>Week 3: Planning my stop-motion project Work collaboratively with others. Keep my animation idea simple. Design and create a character that can be used in my animation. Decompose my story into smaller parts.</p> <p>Week 4: Stop-motion creation Create a simple animation following my storyboard plan. Decompose my animation into smaller parts. Change my plan to recognise when something is too difficult to animate. Recognise the importance of keeping the camera still and making small movements between shots.</p>	<p>Key concepts: Learning about pixels and binary, creating a pixel picture and saving a JPEG as a bitmap to understand the transfer of image data. Children will learn about the 'fetch, decode, execute' cycle and its real-world applications while beginning to use 3D design tools.</p> <p>Week 1: Pixels Recall how computers transfer data in binary. Relate 8-bit binary to 256 possibilities. Identify that a pixel is the smallest possible element of a digital image. Explain how a series of pixels are used to encode an image.</p> <p>Week 2: Compressing images Images are made of pixels. Relate the number of pixels to the size of an image. Explain one of the methods of JPEG compression. Explain how to reduce the file size of a digital image.</p> <p>Week 3: Fetch-Decode-Execute cycle Understand the difference between ROM and RAM. Know what fetch, decode and execute looks like in different contexts and examples. Explain the fetch, decode and execute cycle.</p> <p>Week 4: Tinkering with CAD Navigate the Tinkercad interface. Follow tutorials to create simple 3D objects.</p>
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THE BRAMBLE ACADEMY

	Use various forms of output [sound].	<p>Explain how the size of random-access memory (RAM) affects the processing of data (CPU).</p> <p>Week 4: Using binary - numbers Recall how binary is used to represent numbers up to 255. Recall that computers use binary mathematically to calculate data. Carry out binary addition.</p> <p>Week 5: Using binary - text Recall that binary is the main means of all data transfer. Identify that data transfer needs a common language. Use binary to create a written message.</p>	<p>Week 5: Programming a scoreboard Decompose a program. Write an algorithm. Debug a program.</p>	<p>Week 5: Editing my stop-motion project Make small changes to my models to make my animation smoother. Delete frames. Assess my animation.</p>	<p>Describe what I have learned from the tutorial.</p> <p>Week 5: Tinkercad design Apply what I learned from Tinkercad tutorials to design a 3D object. Create a tyre design that addresses the challenges of the Martian terrain. Explain the features of my tyre design.</p>
<p>Vocabulary: algorithm, copyright, credit, fake news, inaccurate, index, keywords, online, page rank, search engine, TASK, web crawler, website, www</p>	<p>Vocabulary: bug, code, debug, decompose, loop, music, output, pitch, program, repeat, rhythm, Scratch, soundtrack, tempo, timbre, tinker</p>	<p>Vocabulary: 8-bit binary, addition, ASCII, binary code, Boolean, byte, CPU, data, data transmission, decimal numbers, discovery, distance, hexadecimal, input, Mars Rover, Moon, numerical data, output, planet, radio signal, RAM, scientist, sequence, signal, simulation, space, subtraction</p>	<p>Vocabulary: algorithm, animation, app, blocks, Bluetooth, code block, connection, create, debug, decompose, designing, desktop, device, download, images, input, instructions, laptop, load, loop, Micro:bit, outputs, pairing, pedometer, polling, predict, repetition, reset, sabotage, scoreboard, screen, systematic, tablet, tinkering, USB, variables, wi-fi, wireless, wires</p>	<p>Vocabulary: animation, animator, background, character, decomposition, design, digital device, edit, evaluate, flipbook, fluid movement, frames, model, moving images, onion skinning, still images, stop motion, storyboard, thaumatrope, zoetrope</p>	<p>Vocabulary: 3D, algorithm, binary image, CAD, compression, CPU, data, drag and drop, fetch, decode, execute, ID card, input, JPEG, memory, online community, operating system, output, pixels, RAM, responsible, RGB, ROM, safe</p>
Prior Learning:	Prior Learning:	Prior Learning:	Prior Learning:	Prior Learning:	Prior Learning: