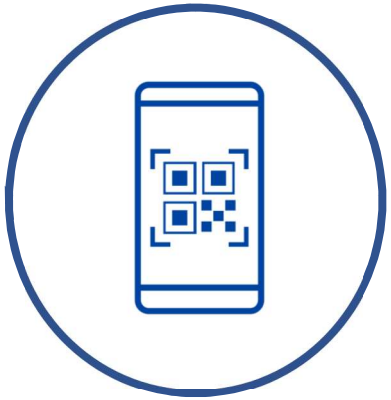
Computing overview

Key concepts

Digital Literacy

Information Technology

Computer Science



Year 1/2- A	Autumn		Spring		Summer	
Key skills & ideas (disciplinary knowledge)	**Computing systems and networks** - Identifying hardware and using software, while exploring how computers communicate and connect to one another. **Programming** - Understanding that a computer operates on algorithms, and learning how to write, adapt and debug code to instruct a computer to perform set tasks. **Creating media** - Learning how to use various devices — record, capture and edit content such as videos, music, pictures and photographs. Data handling - Ensuring that information is collected, recorded, stored, presented and analysed in a manner that is useful and can help to solve problems. **Online safety** - Understanding the benefits and risks of being online — how to remain safe, keep personal information secure and recognising when to seek help in difficult situations.					
Key vocabulary	Battery, buttons, computer, desktop, electricity, input, invention, keyboard, laptop, mouse, output, robot screen (monitor), tablet, technology, wire	Abstraction, algorithm, artificial intelligence, bug, clear, correct, data, debug, decompose, error, key features, loop, predict, unnecessary	Author, back button, backspace, bold, copy, copyright, cut, delete, forward button, highlight, image, import, italics, keyboard, keyboard shortcut, keyword, layout, navigate, paste, redo, search, space bar, text, text effects, touch typing, underline, undo word processing	Algorithm, block coding, bug, debug, evaluate, micro:bit, MakeCode, program, programming, sequence	Animation, background, decompose, digital device, drawing, flipbook, frames, moving images, object, onion skinning, plan, still images	Algorithm, astronaut, column, data, digital content, essential, experiment, Goldilocks zone, interactive map, International Space Station, input, monitor, row, satellite, sensor, space, spreadsheet, survival, temperature thermometer
Focus / Enquiry question	Computing systems and networks 1: What is a computer?	Programming 1: Algorithms and debugging	Computing systems and networks 2: Word processing	Programming 2 Introduction to block coding	Creating media: Stop motion	Data handling: International Space Station
Learning objectives (substantive knowledge)	Computer parts To recognise the parts of a computer. Inputs To recognise how technology is controlled. Technology safari To recognise technology Invention To create a design for an invention Real-world role play To understand the role of computers	Dinosaur algorithm To decompose a game to predict the algorithms that are used. Machine learning To understand that computers can use algorithms to make predictions (machine learning). Through the maze To plan algorithms that will solve problems. Making maps To understand what abstraction is. Unplugged debugging To understand what debugging is.	Getting to know the keyboard To begin to learn to touch type. Getting started with word processing To understand how to use a word processor. Newspaper writer To understand how to add images to a text document. Poetry book To create a poetry book using sources from the internet. Digital writer To create a digital piece of writing.	Tinkering with code To explore programming in games. Tinkering with MakeCode To explore the block code features of MakeCode. What does the code mean? To interpret a MakeCode algorithm using paper chains. Building a program To plan and build a program in MakeCode. Evaluating a program To evaluate if a program is successful based on the MakeCode outcome.	What is animation? To understand what animation is. My first animation To create a stop motion animation. Planning my project To plan my stop motion animation. Creating my project To create a stop motion animation. Creating my project To create a stop motion animation.	Homes in space To locate features on an interactive map. Space bag To create a digital drawing. Warmer, colder To input data in a spreadsheet. Experiments in space To create algorithms for healthy plant growth. Goldilocks planets To retrieve data from a spreadsheet.
Hardware, software and equipment list	Sketchpad Sticky notes for each table group – approximately 10 per group. Clipboards – one per group of four pupils. Tablets or digital cameras – one per group of four pupils. 5 cameras or tablets for filming. 10 whiteboards	Scratch (website) Whiteboards and pens or notebooks. Lego or building blocks. Digital camera (optional). Mini figures. A3 paper to draw plan views. Coloured pencils for any colour. Partition wall, such as a piece of cardboard. Flat surface, such as a desk.	Microsoft Word or Google Docs Pupils to select a book they like from the library or classroom. A copy of 'The Gingerbread Man' or another well-known tale.	MakeCode Whiteboards and pens. Scissors and glue sticks. Strips of paper. A4 paper.	Stop motion studio (app) - Android or iOS Sticky notes – nine/ten per pupil (optional).	Sketchpad Put a thermometer in at least five different places around the school – preferably areas that will have different temperatures.
National curriculum	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 technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.	Use logical reasoning to predict the behaviour of simple programs.	Recognise common uses of information technology beyond school.	Use technology purposefully to create, organise, store, manipulate and retrieve digital content.

Year 1/2 - B	Autumn		Spring		Summer	
Key skills & ideas (disciplinary knowledge)	**Computing systems and networks** - Identifying hardware and using software, while exploring how computers communicate and connect to one another. **Programming** - Understanding that a computer operates on algorithms, and learning how to write, adapt and debug code to instruct a computer to perform set tasks. **Creating media** - Learning how to use various devices — record, capture and edit content such as videos, music, pictures and photographs. Data handling - Ensuring that information is collected, recorded, stored, presented and analysed in a manner that is useful and can help to solve problems. **Online safety** - Understanding the benefits and risks of being online — how to remain safe, keep personal information secure and recognising when to seek help in difficult situations.					
Key vocabulary	Account, click, clipart, computer, drag, drag and drop, layers, log off, log on, mouse, password, predict, resize, screen (monitor), software, tool, username	Algorithm, artificial intelligence, bug, chunks, code, computer, debug, decompose, device, directions, input, instructions, manageable, order, organise, output, program, problem, solution, specific, tasks, virtual assistant	annotate, cells, components, create, data, debug, designing, digital content, digital image, document, e-document, edit, editing software, editing program, evaluate, folder, graphics, input, instructions, log in, photo, program, order, robot, save, sequence, share, software, spreadsheet, table	algorithm, Bee-Bot, code, debug, demonstration, explain, explore, filming, inputting, instructions, pause, precise, predict, program, review, test, tinker, video	bar chart, block graph, branching database, categorise, chart, click and drag, compare, count, data, data collection, data record, data representation, edit, input, keyboard, line graph, mouse, information, label, pictogram, pie chart, process, record, resize, sort, table, tally, values	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
Focus / Enquiry question	**Computing systems and networks**: Improving mouse skills	**Programming 1:** Algorithms unplugged	**Skills showcase**: Rocket to the moon	**Programming 2:** Bee-Bot	**Data handling**: Introduction to data	**Creating media**: Digital imagery
Learning objectives (substantive knowledge)	Logging in To log in to a computer and access a website. Click and drag skills To develop mouse skills. Drawing shapes To use mouse skills to draw and edit shapes. Drawing a story To draw a scene from a story using digital tools. Self-portrait To create a self-portrait using digital techniques.	What is an algorithm? To understand what an algorithm is Algorithm pictures To follow instructions precisely to carry out an action. Virtual assistants To understand that computers and devices around us use inputs and outputs. Step by step To understand and be able to explain what decomposition is. Debugging directions To know how to debug an algorithm	Rocket materials To recognise that digital content can be represented in many forms. Rocket design To design a rocket using a graphics editing programme Rocket building instructions To sequence a set of instructions Making a rocket To build a rocket. Rocket launching To test a design and record data	Getting to know a Bee-Bot To explore a new device Making a Bee-Bot video To create a demonstration video. Precise instructions To plan and follow a precise set of instructions. Bee-Bot world To program a device Three little pigs To create a program that tells a story.	Zoo data To show data in different ways. Picture data To use technology to represent data. Minibeast hunt To collect and record data. Animal branching databases To sort data into a branching database. Inventions To design an invention to gather data.	Planning a photo story To understand and create a sequence of pictures. Taking photos To take clear photos. Editing photos – Microsoft To edit photos. Searching for images To search for and import images. Photo collage To create a photo collage.
Hardware, software and equipment list	Sketchpad. Mirrors or photography software.	Dressing up clothes and accessories, for example, scarves and hats. Dice (one per pair of children). Selection of reading books for sorting. 2D shapes for drawing around.	Sketchpad. Sturdy paper or firm card – two sheets per group. A copy of the book Moonshot: The Flight of Apollo 11 by Brian Floca – copies can be found at bookstores and/or online. Card. Tape. Cardboard boxes. Plastic bottles – one per group. Other materials such as foil, plastic packaging, felt tips, coloured paper, sequins, tissue paper etc. Trundle wheels or metre sticks. Foam javelin or your own bottle rocket to model launching a rocket.	Building blocks. Charged Bee-Bots or Blue-Bots (ideally six) – if you only have one then the pupils can take turns. Fully charged digital recording devices, to record visuals and sound (digital cameras, tablets, laptops with webcams). A large space, the school hall or playground. Several coloured cones, depending on the size of the space.	Sketchpad Counting apparatus e.g. cubes, lolly sticks etc. Tablet or digital camera (more if you want children to take photos of their own work). Clipboards – one per group of three or four pupils.	Google Photos. (PC/Laptop). Google Photos app. (Tablets). Google slides. Microsoft Photos. Microsoft Powerpoint. Sketchpad. A selection of small people toys and animals/dinosaurs. Picture book (optional). Small world play characters – one person and one animal per group. Digital cameras/tablets
National curriculum	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; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.	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.	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 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 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; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

Year 3	Autumn		Spring		Summer	
Key skills & ideas (disciplinary knowledge)	**Computing systems and networks** - Identifying hardware and using software, while exploring how computers communicate and connect to one another. **Programming** - Understanding that a computer operates on algorithms, and learning how to write, adapt and debug code to instruct a computer to perform set tasks. **Creating media** - Learning how to use various devices — record, capture and edit content such as videos, music, pictures and photographs. Data handling - Ensuring that information is collected, recorded, stored, presented and analysed in a manner that is useful and can help to solve problems. **Online safety** - Understanding the benefits and risks of being online — how to remain safe, keep personal information secure and recognising when to seek help in difficult situations.					
Key vocabulary	Device, file, internet, network, network switch, packet data, router, server, the cloud, user, wi-fi, wired wireless, wireless access point	Algorithm, animation, application, code, code block, debug, decompose, game, interface, loop, predict, program, remixing code, repetition code, review, Scratch, sprit, tinker	Attachment, bcc (blind carbon copy), cc (carbon copy), compose, content, cyberbullying, document, domain, download, email, email account, email address, emoji, emotions, fake, font, genuine, hacker, ions, inbox, information, link, log in, log out, negative language, password, personal information, positive language, reply, responsible, digital citizen, scammer, settings, send, sign in, spa, email, subject bar, theme, tone, username, virus, wi-fi	Algorithm, assemble, CPU (central processing unit), data, decompose, desktop, disassemble, GPU (graphics processing unit), hard drive, HDD (hard disk drive), infinite loop, input, keyboard, laptop, memory, microphone, monitor, mouse, output, photocopier, program, QR Code, RAM (random access memory), ROM (read only memory), storage, tablet device, technology, touchscreen touchpad	Application, camera angle, clip, cross blur, cross fade, cross zoom, desktop, digital device, dip to black, directional wipe, edit, film, film editing software, graphics, import, key events, laptop, music, photo, plan, recording, sound effects, storyboard, time code, trailer, transition, video, voiceover	Category, chart, data, database, field, filter, graph, information, interpret, questionnaire, record, representation, sort, spreadsheet
Focus / Enquiry question	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 (Previously called 'Digital literacy')	Data handling: Comparison cards databases
Learning objectives (substantive knowledge)	What is a network? To recognise what a network is. A file's journey To demonstrate how information moves around a network. How a website works To demonstrate how a website works. Routers To explore the role of a router. What is packet data? To identify the role of packet data.	Tinkering with Scratch To explore a programming application. Using loops To use repetition (a loop) in a program. Making an animation To program an animation. Storytelling To program a story. Programming a game To program a game.	Communicating with technology To understand how we communicate with technology. Sending an email To understand what emails are and how to send one. Adding attachments To know how to create an email with an attachment. Be kind online To understand the importance of being kind online. Fake emails To recognise when an email is not genuine.	Inputs and outputs To recognise basic inputs and outputs. Building a paper laptop To identify the components inside a laptop. Following instructions To understand the purpose of computer parts. Computer memory To understand the purpose of computer parts. Dismantling a tablet To decompose a tablet computer.	Planning a book trailer To plan a book trailer. Filming To take photos or videos that tell a story. Editing the trailer To edit a video. Transitions and text To add text and transitions to a video. Video review To evaluate video editing.	Records, fields and data To understand the terminology around databases. Race against the computer To compare paper and computerised databases. Sorting and filtering – Google To sort, filter and interpret data. Representing data – Google To represent data in different ways. Planning a holiday To sort data for a purpose.
Instruments	Ball of string or wool, Clipboards, Whiteboards and pens.A tray or box.PE bibs. 10 envelopes., A3 paper. Gluesticks., Scissors. Building blocks or cubes. Stopwatch or timer.	Scratch (website)	Microsoft Outlook or Gmail	Sketchpad Pieces of string. Large sized paper – one piece per table. Felt tip pens – variety of colours on each table. Tablet or device with QR code scanner installed.	iMovie Access to a selection of books that the children will be familiar with.	Google Forms. Google Sheets. Microsoft Forms. Microsoft Excel Example of paper databases such as an Argos catalogue or a phone book (optional).
National curriculum	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.	Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.	Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.	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.

Year 4	Autumn		Spring		Summer	
Key skills & ideas (disciplinary knowledge)	**Computing systems and networks** - Identifying hardware and using software, while exploring how computers communicate and connect to one another. **Programming** - Understanding that a computer operates on algorithms, and learning how to write, adapt and debug code to instruct a computer to perform set tasks. **Creating media** - Learning how to use various devices — record, capture and edit content such as videos, music, pictures and photographs. Data handling - Ensuring that information is collected, recorded, stored, presented and analysed in a manner that is useful and can help to solve problems. **Online safety** - Understanding the benefits and risks of being online — how to remain safe, keep personal information secure and recognising when to seek help in difficult situations.					
Key vocabulary	Average, collaborate, comment, data, data representation, edit, e-document, email, insert (file), multiple choice, numerical data, online, presentation, rating, reply, resolve, reviewing comments, share, slide, spreadsheet, suggestion, survey, teamwork, transition	code block, conditional statement, coordinates, decompose, feature, information, negative number, orientation, position, program, project, script, sprite, stage, tinker, variable	Assessment, audience, checklist, collaboration, content, contribution, create, design, embed, evaluate, features, Google Sites, hobby, homepage, hyperlinks, images, insert, online, plan, progress, published, record, review, style, subpage, tab, theme, web page, website world wide web	Code, 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	Abstraction, algorithm, code, computational thinking, decomposition, input, logical reasoning, output, pattern recognition, script, sequence, variable	Accurate, climate zone, condensation, cylinder, degree Celsius, evaporation, extreme weather, filming, forecast, heat sensor, lightning, measurement, pinwheel, presenter, rain, satellite, script, sensor data, solar panel, temperature, thermometer, tornado, weather, weather forecast, wind speed
Focus / Enquiry question	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
Learning objectives (substantive knowledge)	Teamwork To understand that software can be used to work online collaboratively. Sharing a document To understand how to contribute to someone else's work effectively. Slide presentations To understand how to create effective presentations. Google Forms To understand how to create and share Google Forms. Shared spreadsheets To understand how to use a shared spreadsheet to explore data.	Scratch reminder To recall the key features of Scratch. Identifying what code does To understand how a Scratch game works by using decomposition to identify key features. Introduction to variables To recognise what a variable is. Making a variable To understand how to make a variable in Scratch. Times tables project To create a quiz using variables.	Getting to know Google Sites To explore the features of Google Sites. Book review webpage To plan content for a collaborative webpage. Creating a webpage To create a webpage as part of a collaborative class website. Planning my website To plan and create a website. Creating my website To create and evaluate a website.	What is HTML? To recognise the role of HTML in a web page. Remixing HTML To change HTML code for a specific purpose. HTML unplugged To recognise the basics of HTML. Website hacking To alter the HTML on a live web page. Replacing images To alter an image on a web page.	What is computational thinking? To understand that computational thinking is made up of four key strands. Decomposition To understand what decomposition is and how to apply it to solve problems. Abstraction and pattern recognition To understand what pattern recognition and abstraction mean. Algorithm design To understand how to create an algorithm and what it can be used for. Applying computational thinking To combine computational thinking skills to solve a problem.	What is the weather? To log data taken from online sources in a spreadsheet. Weather stations To design a weather station. Extreme weather To design an automated machine to respond to sensor data. Satellites and forecasts To understand how weather forecasts are made. Presenting forecasts To use tablets or digital cameras to present a weather forecast.
Instruments	Google Docs Google Slides Google Forms Google Sheets	Scratch (website)	Google sites	Trinket	Scratch (website) Prepare bead strings with repeated patterns. Prepare a short dance or hand clap sequence – long enough that the children won't be able to easily follow it. Plasticine (one per pair or small group). Dice.	Google Sheets or Microsoft Excel. Sketchpad Film editing software such as iMovie (optional).
National curriculum	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.	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.	Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.	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.

Year 5	Autumn		Spring		Summer	
Key skills & ideas (disciplinary knowledge)	**Computing systems and networks** - Identifying hardware and using software, while exploring how computers communicate and connect to one another. **Programming** - Understanding that a computer operates on algorithms, and learning how to write, adapt and debug code to instruct a computer to perform set tasks. **Creating media** - Learning how to use various devices — record, capture and edit content such as videos, music, pictures and photographs. Data handling - Ensuring that information is collected, recorded, stored, presented and analysed in a manner that is useful and can help to solve problems. **Online safety** - Understanding the benefits and risks of being online — how to remain safe, keep personal information secure and recognising when to seek help in difficult situations.					
Key vocabulary	Algorithm, copyright, credit, fake news, inaccurate, index, keywords, online, page rank, search engine, TASK, web crawler, website, www	Bug, code, debug, decompose, loop, music, output, pitch, program, repeat, rhythm, Scratch, soundtrack, tempo, timbre, tinker	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	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	Animation, animator, background, character, decomposition, design, digita, device, edit, evaluate, flipbook, fluid movement, frames, model, moving images, onion skinning, stil, images, stop motion, storyboard, thaumatrope, zoetrope	3D, algorithm, binary image, CAD, compression, CPU, data, drag and drop, fetch, decode, execute, ID card, input, JPEG, memory, online community, operating system, output, pixels, RAM, responsible, RGB, RO, safe
Focus / Enquiry question	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
Learning objectives (substantive knowledge)	Searching basics To understand what a search engine is and how to use it. Inaccurate information To be aware that not everything online is true. Web quest To search effectively. Information poster To create an informative poster. Web crawlers To understand how search engines work.	Tinkering with Scratch music elements To tinker with Scratch music elements. Scratch soundtracks To create a program that plays themed music. Planning a soundtrack To plan a soundtrack program. Programming a soundtrack To program a soundtrack. Battle of the bands To program music for a specific purpose.	Mars Rover To identify how and why data is collected from space. Binary code To read and calculate numbers using binary code. Computer architecture To identify the computer architecture of the Mars Rovers. Using binary – numbers To use simple operations to calculate bit patterns. Using binary – text To represent binary as text.	Tinkering with BBC Micro:bit To tinker with a new piece of software. Programming an animation To program an animation. Polling program To recognise coding structures. Programming a pedometer To create a program for a specific task. Programming a scoreboard To create a program.	Animation explored To understand what animation is. Exploring stop-motion To understand what stop motion animation is. Planning my stop-motion project To plan a stop motion video. Stop motion creation To create a stop motion animation. Editing my stop-motion project To edit my stop motion animation.	Pixels To recognise how bit patterns represent images as pixels. Compressing images To explain how the data for digital images can be compressed. Fetch-Decode-Execute cycle To identify and explain the fetch, decode and execute cycle. Tinkering with CAD To learn the basics of using Tinkercad through tutorials. Tinkercad design To design a functional tyre for the Mars rover using Tinkercad.
Instruments	Sketchpad Non-fiction texts – at least one between three. At least 15 each of the following – pencils, erasers, whiteboards and rulers (or other appropriate objects).	Scratch (website) Headphones (strongly recommended). Headphone splitters (if pupils are sharing laptops). Choose a story for the children to work with. Ideally, it should be something the children have been working on in English/Guided Reading, or you could choose a familiar, short picture book.		BBC micro:bit app Android or iOS or you can use the website if using laptops/desktops. BBC micro:bits and battery packs. Micro USB cables if you're using laptops. If you have no access to BBC micro:bits then use the online emulator available on the website.	Option 1 Stop motion studio (app) Android or iOS. Plasticine to create objects/characters. Plastic containers or cellophane to wrap creations in.	Microsoft Excel or Google Sheets. TinkerCAD. Squared or graph paper – one per pupil.
National curriculum	Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.	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.	Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.	Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.	Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.

Year 6	Autumn		Spring		Summer	
Key skills & ideas (disciplinary knowledge)	**Computing systems and networks** - Identifying hardware and using software, while exploring how computers communicate and connect to one another. **Programming** - Understanding that a computer operates on algorithms, and learning how to write, adapt and debug code to instruct a computer to perform set tasks. **Creating media** - Learning how to use various devices — record, capture and edit content such as videos, music, pictures and photographs. Data handling - Ensuring that information is collected, recorded, stored, presented and analysed in a manner that is useful and can help to solve problems. **Online safety** - Understanding the benefits and risks of being online — how to remain safe, keep personal information secure and recognising when to seek help in difficult situations.					
Key vocabulary	acrostic code, audio advert, brute force hacking, Caesar cipher, chip and PIN system, cipher, combination, date shift cipher, discovery, invention, Nth letter cipher, password, pigpen cipher, scrambled, script, secret, secure, technological advancement, trial and error	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	Algorithm, code, command, design, import, indentation, input, instructions, loop, output, patterns, random, remix, repeat shape	Algorithm, barcode, Boolean, brand, chip, commuter, contactless, data, encrypt, infrared, proximity, QR code, QR scanner, radio waves, RFID, signal, spreadsheet, systems analyst, transmission wireless	big data, Bluetooth, corrupted, data, energy, GPS, improve, infrared, internet of things, personal, privacy, QR codes, revolution, RFID, SIM, simulation, smart city, smart school, stop motion, threat, wi-fi wireless	Abstraction, adapt, advert, algorithm, bug, code, coding, debug, design, edit, electronic, evaluate, image rights, images, information, input, loop, photos, product, program, repetition, selection, sequence, software, structure, variable, video website
Focus / Enquiry question	Computing systems and networks: Bletchley Park and the history of computers	Computing systems and networks: Exploring AI	Programming: Intro to Python	Data handling 1: Big Data 1	Data handling 2: Big Data 2	Skills showcase: Inventing a product
Learning objectives (substantive knowledge)	Secret codes To understand there are many different types of secret codes. Brute force hacking To understand the importance of having a secure password. Computers of the past To recognise the importance of the history of computers and create a well-researched presentation. Future computer To design a computer of the future. Audio adverts To create an audio advert for a future computer.	What is AI? To explore the basics of AI. AI and text To recognise how AI processes and responds to text prompts. AI through images To recognise how AI can be used to explore and generate images. Coding AI To apply AI-generated HTML code to the website Trinket. Ethics and AI To debate the ethical implications of AI.	Tinkering with Logo To tinker with a new piece of software. Nested loops To understand nested loops. Using Python To understand basic Python commands. Using loops in Python To use loops when programming. Coding Mondrian To understand the use of random numbers.	Barcodes To identify how barcodes and QR codes work. Transmitting data To know how infrared waves transmit data. RFID To recognise how RFID is used. Using RFID To input and analyse real-world data. Transport data To analyse and evaluate data.	Transferring data To explain how data can be safely transferred. Data usage To investigate the data usage of different online activities. The Internet of Things To identify how data collection can improve city life. Designing a smart school To design a system for turning a school into a smart school. Smart school presentation To present ideas for turning a school into a smart school.	Invention design To design an electronic product. Coding and debugging To code and debug a program. Computer Aided Design (CAD) To use CAD software to design a product. My product's website To create a website. Video advert To create a video advert.
Instruments	Scratch (website). Google Slides. Microsoft PowerPoint. TinkerCAD. TwistedWave. Access to internal microphones or USB microphones for the computers you are using. Provide headphones if possible. Outdoor space or large hall for the start of the lesson.	Kidgeni (website). Trinket. Devices with internet access (one between two). Blank paper (one each).	Turtle Academy. Trinket. Scratch (website).	Microsoft Excel or Google Sheets. Range of working remotes (e.g. for an interactive whiteboard, television, stereo, etc) – ideally one per table. Video recording devices, e.g. tablets, digital cameras or laptops with built-in cameras.	Access to an outdoor space, lines marked on the ground approximately ten meters apart. One tennis racket between three pupils.	BBC micro:bit app Android or iOS or you can use the website if using laptops/desktops. TinkerCAD., Google Sites. Microsoft Sway WeVideo. BBC micro:bits and battery packs. Micro USB cables if you're using laptops. If you have no access to BBC micro:bits then use the online emulator available on the website .
National curriculum	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.	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.	Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	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.	Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.

Additional online safety lessons, to be delivered half termly

	Year 1/2 - A	Year 1/2 - B	Year 3	Year 4	Year 5	Year 6
Key skills & ideas (disciplinary knowledge)	**Computing systems and networks** – Identify/ing hardware and using software, while exploring how computers communicate and connect to one another. **Programming** - Understanding that a computer operates on algorithms, and learning how to write, adapt and debug code to instruct a computer to perform set tasks. **Creating media** - Learning how to use various devices — record, capture and edit content such as videos, music, pictures and photographs. Data handling - Ensuring that information is collected, recorded, stored, presented and analysed in a manner that is useful and can help to solve problems. **Online safety** - Understanding the benefits and risks of being online — how to remain safe, keep personal information secure and recognising when to seek help in difficult situations.					
Key vocabulary	app, appropriate, device, digital footprint, feelings, going online, in-person interactions, internet, kindness, offline activity, online activity, online experience, online interactions, online safety, personal information, pop-up, posting online, report, responsible digital citizen, screen time, sharing online, stranger, technology, trusted adult, unkind, website	Accepting, consent, denying permission, fake, giving permission, offline, online, password, permission, personal information, pop-up, pressure, private information, real, reliable, sharing online, source, trusted adult	Accurate, age restrictions, autocomplete, belief, charity, content, digital device, fact, fake news, hoax, internet, internet of things, opinion, online emotions, organization, permission, privacy settings, reliable, search, search engine, share, smart device, social media platforms	Accuracy, ad, advantage, advertisement, belief, bot, computer, disadvantage, distraction, fact, hashtag, implications, in-app purchases, influencer, opinion, program, recommendation, reliable, risk, screen time, search results, snippets, sponsored, trustworthy	Accurate, advice, app, application, app permissions, biography, bullying, communication, emojis, health, in-app purchases, information, judgement, meme, mental health, mindfulness, negative contribution, online, online communication, opinion, organisation, password, personal information, positive contribution, real world, strong password, summarise, support, trusted adult, well-being	digital personality, financial information, hacking, inappropriate, malware, online bullying, online reputation, password, personal information, phishing, privacy settings, private, reliable source, report, respect, scammers, screen grab, screenshot, secure, selfie, software updates, two-factor authentication, URL username
Focus / Enquiry question	**Online safety**					
Learning objectives (substantive knowledge)	Using the internet safely To recognise what the internet is and how to use it safely. Online emotions To identify how people's feelings and emotions can be affected by online content. Always be kind and considerate To recognise how to treat others, both online and in person Posting and sharing online. To recognise the importance of being careful when posting and sharing online. How much time should we spend on technology? To discuss ways to balance time spent online and offline	What happens when I post online? To decide which information is safe to share online. How do I keep my things safe online? To practise keeping information safe and private online. It's my choice To recognise when to deny permission online. Is it true? To recognise that not everything online is true.	Beliefs, opinions and facts on the internet To understand how the internet can be used to share beliefs, opinions and facts. Who should I ask? To explain what should be done before sharing information online. When being online makes me upset To identify the effects that the internet can have on people's feelings. Sharing of information To understand the ways personal information can be shared on the internet. Rules of social media platforms To understand the rules for social media platforms.	What happens when I search online? To describe how to search for information within a wide group of technologies and make a judgement about the probable accuracy. How do companies encourage us to buy online? To describe some of the methods used to encourage people to buy things online. Fact, opinion or belief? To explain why lots of people sharing the same opinions or beliefs online do not make those opinions or beliefs true. What is a bot? To explain that technology can be designed to act like or impersonate living things. What is my #TechTimetable like? To explain how technology can be a distraction and identify when I might need to limit the amount of time spent using technology.	Online protection To understand how apps can access personal information and how to alter the permissions. Online communication To be aware of the positive and negative aspects of online communication. Online reputation To understand how online information can be used to form judgements. Online bullying To discover ways to overcome bullying. Online health To understand how technology can affect health and wellbeing.	Life online To describe online issues that give us negative feelings and know how to get help. Sharing online To explore the impact and consequences of sharing online. Creating a positive online reputation To know how to create a positive online reputation. Capturing evidence To describe how to capture bullying content as evidence. Password protection To manage personal passwords effectively. Think before you click To be aware of strategies that help protect people online.
Instruments	Paper plates or plain A4 paper/card for masks – one per pupil. Ribbon or string – one per pupil.	Have a box or bag full of a few objects that are special to you e.g. photo of family members, cuddly toys etc. Scissors – at least one per table group.			Microsoft Word or Google Docs. A3 poster paper – enough for one between two pupils.	Microsoft Word or Google Docs.

National curriculum	Recognise common uses of information technology beyond school. Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.	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; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies	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. Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. 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.	Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. 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. Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	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. Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.