



Stoke Row Church of England Primary School

Curriculum Statement for Computing

Level expected at the end of EYFS	
Personal, social and emotional development	- Remember rules without needing an adult to remind them. - Show resilience and perseverance in the face of a challenge. - Know and talk about the different factors that support their overall health and wellbeing: -sensible amounts of 'screen time'. - Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. Explain the reasons for rules, know right from wrong and try to behave accordingly.
Physical development	- Match their developing physical skills to tasks and activities in the setting. - Develop their small motor skills so that they can use a range of tools competently, safely and confidently.
Understanding the world	Explore how things work.
Expressive arts and design	- Develop their small motor skills so that they can use a range of tools competently, safely and confidently. - Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function.
Key Stage 1 National Curriculum Expectations	Key Stage 2 National Curriculum Expectations
Pupils should be taught to: understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions	Pupils should be taught to: design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts

• 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 • 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 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 • 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
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Intent

A high-quality computing education equips pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science, and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which pupils are taught the principles of information and computation, how digital systems work, and how to put this knowledge to use through programming. Building on this knowledge and understanding, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world.
(National Curriculum Computing 2014)

At Stoke Row Primary School, we use Kapow Computing Scheme to ensure our children get a sense of enjoyment around using technology and develop their appreciation of its capabilities and experience opportunities technology offers to create, manage, organise and collaborate. Through this curriculum, pupils' confidence is developed when encountering new technology, which is a vital skill in the ever evolving and changing landscape of technology and to ensure their **Bright Futures**. Pupils are taught to be digitally competent, to have a range of transferable skills and to become responsible and respectful online citizens.

Implementation

The aims for the implementation of the Computing Curriculum at Stoke Row CofE Primary School are to ensure that all children:

- can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation
- can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems
- can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems
- are responsible, competent, confident and creative users of information and communication technology.

SUBSTANTIVE KNOWLEDGE

There are 4 key strands to the substantive computing knowledge we teach our children:

- **Computer Science** – Can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic, algorithms and data representation. Can analyse problems in computational terms, and have repeated practical experience of writing computer programs in order to solve such problems.
- **Information technology** – Can evaluate and apply information technology, including new or unfamiliar technologies, analytically to solve problems.
- **Digitally literate** – Are responsible, competent, confident and creative users of information and communication technology.

- **Online Safety** – building on digital literacy; understanding of e-safety including cyber bullying and safeguarding; personal data usage; data protection.

DISCIPLINARY KNOWLEDGE

There are five key areas which underpin the disciplinary knowledge and skills identified as central to pupils' computing education and to equip them for digital life in the 21st century; part of the connected world framework. These key areas are returned to in each year group making it clear to see prior and future learning. Each time pupils revisit an area of learning they are reminded of prior knowledge which is then built upon with increasing depth and complexity.

5 Key areas:

- **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.
- **Handling data** - 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.

The curriculum is led and overseen by the computing curriculum leader and Headteacher, who regularly monitor, evaluate and review computer teaching and learning, celebrating and sharing good practice. Formative assessments will be integrated into every day computing teaching to ensure teachers have an in-depth knowledge of the children's learning and inform their next steps. The National Curriculum 2014 and the Early Years Foundation Stage statutory framework 2021, together with the Development Matters non-statutory curriculum guidance 2021, provide the basis for our computer curriculum, which is then tailored to meet the learning and developmental needs of the children in our school. Teachers' day-to-day planning is based on the 'Kapow Primary' Computing Curriculum Long Term Plans. These include substantive knowledge for each area of study, and the disciplinary knowledge enabling children to think like computer scientists.

Impact

- Children will be digitally literate; confidently and enthusiastically talking about their learning, using age-appropriate computing vocabulary;
- They will have written computer programs to solve problems;
- They will understand computer science including abstraction, logic, algorithms and data representation;
- They will be confident and creative users of information and communication technology and be able to make well balanced judgements about what they read, see and hear;
- They will know how to be safe online;
- They will be able to utilise information and communication technology to support the acquisition of knowledge in other curriculum subjects e.g. history, geography, PE, art and DT;
- They will be able to make links between computing skills and other curriculum skills e.g. mathematics, English and PSHCE;
- They will be able to link the use of computer science to our 5 school values (perseverance, kindness, courage, excellence and respect) and to carry over their acquired knowledge into their **Bright Futures**;
- They will be able to join in with the connected world framework; their contributions and discussions guided by our school values and vision.

Progression of Skills: Substantive Knowledge

NB: Statements in bold are covered in both cycles

Computer Science			
	Reception	Key Stage 1	
		Cycle A	Cycle B
Hardware	Learning how to operate a camera to take photographs of meaningful creations or moments. Learning how to explore and tinker with hardware to develop familiarity and introduce relevant vocabulary. Recognising and identifying familiar letters and numbers on a keyboard. Developing basic mouse skills such as moving and clicking.	Learning how to operate a camera or tablet to take photos and videos. Learning how to explore and tinker with hardware to find out how it works. Recognising that some devices are input devices and others are output devices. Learning where keys are located on the keyboard. Recognising that buttons cause effects and that technology follows instructions. Using greater control when taking photos with cameras, tablets or computers.	Learning how to operate a camera or tablet to take photos and videos. Learning how to explore and tinker with hardware to find out how it works. Recognising that some devices are input devices and others are output devices. Learning where keys are located on the keyboard. Understanding what a computer is and that it's made up of different components. Learning how we know that technology is doing what we want it to do via its output. Developing confidence with the keyboard and the basics of touch typing. Recognising that buttons cause effects and that technology follows instructions. Using greater control when taking photos with cameras, tablets or computers.
Networks and data representation	N/A	N/A	N/A
Computational Thinking	Using logical reasoning to understand simple instructions and predict the outcome.	Using decomposition to solve unplugged challenges. Using logical reasoning to predict the behaviour of simple programs. Developing the skills associated with sequencing in unplugged activities. Following a basic set of instructions.	Learning that decomposition means breaking a problem down into smaller parts and articulating this. Using decomposition to solve unplugged challenges. Using logical reasoning to predict the behaviour of simple programs.

		Assembling instructions into a simple algorithm. Explaining what an algorithm is. Following an algorithm. Creating a clear and precise algorithm. Learning that programs execute by following precise instructions. Incorporating loops within algorithms.	Developing the skills associated with sequencing in unplugged activities. Following a basic set of instructions. Assembling instructions into a simple algorithm. Explaining what an algorithm is. Following an algorithm. Creating a clear and precise algorithm. Learning that programs execute by following precise instructions. Incorporating loops within algorithms. Decomposing a game to predict the algorithms used to create it. Learning that there are different levels of abstraction.	
Programming	Following instructions as part of practical activities and games. Learning to give simple instructions. Experimenting with programming a Bee-bot/Blue- bot and learning how to give simple commands. Learning to debug instructions, with the help of an adult, when things go wrong.	Programming a Floor robot to follow a planned route. Using programming language to explain how a floor robot works. Using logical thinking to explore software, predicting, testing and explaining what it does. Using an algorithm to write a basic computer program. Using loop blocks when programming to repeat an instruction more than once. Learning to debug instructions when things go wrong. Learning to debug an algorithm in an unplugged scenario.	Learning to debug instructions when things go wrong. Learning to debug an algorithm in an unplugged scenario. Using logical thinking to explore software, predicting, testing and explaining what it does. Using an algorithm to write a basic computer program.	
Computer Science				
	Lower Key Stage2		Upper Key Stage 2	
	Cycle A	Cycle B	Cycle A	Cycle B
Hardware	Understanding what the different components of a computer do and how they work together.	N/A	Understanding and identifying barcodes, QR codes and RFID.	Learning that external devices can be programmed by a separate computer.

	Drawing comparisons across different types of computers. Learning about the purpose of routers. Using tablets or digital cameras to film a weather forecast. Understanding that weather stations use sensors to gather and record data which predicts the weather.		Identifying devices and applications that can scan or read barcodes, QR codes and RFID. Understanding how corruption can happen within data during transfer (for example when downloading, installing, copying and updating files).	Learning the difference between ROM and RAM. Recognising how the size of RAM affects the processing of data. Understanding the fetch, decode, execute cycle. Learning about the history of computers and how they have evolved over time. Using the understanding of historic computers to design a computer of the future.
Networks and data representation	Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration. Understanding the role of the key components of a network. Identifying the key components within a network, including whether they are wired or wireless. Understanding that websites and videos are files that are shared from one computer to another. Learning about the role of packets. Understanding how networks work and their purpose. Recognising links between networks and the internet. Learning how data is transferred.	N/A	Understanding that computer networks provide multiple services.	Learning the vocabulary associated with data: data and transmit. Learning how the data for digital images can be compressed. Recognising that computers transfer data in binary and understanding simple binary addition. Relating binary signals (Boolean) to the simple character-based language, ASCII. Learning that messages can be sent by binary code, reading binary up to eight characters and carrying out binary calculations. Understanding how bit patterns represent images as pixels.
Computational thinking	Using decomposition to explain the parts of a laptop computer. Explaining the purpose of an algorithm.	Using decomposition to explore the code behind an animation. Using repetition in programs. Using logical reasoning to explain how simple algorithms work.	Decomposing a program into an algorithm. Decomposing animations into a series of images. Decomposing a story to be able to plan a program to tell a story.	Decomposing a program without support. Predicting how software will work based on previous experience.

		Explaining the purpose of an algorithm. Forming algorithms independently. Using decomposition to solve a problem by finding out what code was used. Using decomposition to understand the purpose of a script of code. Identifying patterns through unplugged activities. Using past experiences to help solve new problems. Using abstraction to identify the important parts during both plugged and unplugged activities.	Predicting how software will work based on previous experience. Writing increasingly complex algorithms for a purpose.	Using past experiences to help solve new problems. Writing increasingly complex algorithms for a purpose.
Programming	Using logical thinking to explore more complex software; predicting, testing and explaining what it does. Remixing existing code	Using logical thinking to explore more complex software; predicting, testing and explaining what it does. Incorporating loops to make code more efficient. Continuing existing code. Making reasonable suggestions for how to debug their own and others' code. Creating algorithms for a specific purpose. Coding a simple game. Using abstraction and pattern recognition to modify code. Incorporating variables to make code more efficient. Remixing existing code.	Debugging quickly and effectively to make a program more efficient. Remixing existing code to explore a problem. Using and adapting nested loops. Programming using the language Python. Changing a program to personalise it. Evaluating code to understand its purpose. Amending code within a live scenario. Iterating and developing their programming as they work. Confidently using loops in programming. Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected. Writing code to create a desired effect. Using a range of programming	Programming an animation. Iterating and developing their programming as they work. Confidently using loops in programming. Using a more systematic approach to debugging code, justifying what is wrong and how it can be corrected. Writing code to create a desired effect. Using a range of programming commands. Using repetition within a program. Predicting code and adapting it to a chosen purpose. Changing a program to personalise it. Evaluating code to understand its purpose. Debugging quickly and effectively to make a program more efficient.

			commands. Using repetition within a program.	Remixing existing code to explore a problem.
Information Technology				
	Reception	Key Stage 1		
		Cycle A	Cycle B	
Using software	Using a simple online paint tool to create digital art.	Using a basic range of tools within graphic editing software. Taking and editing photographs. Developing control of the mouse through dragging, clicking and resizing of images to create different effects. Developing understanding of different software tools. Using software (and unplugged means) to create story animations. Creating and labelling images.	Using a basic range of tools within graphic editing software. Taking and editing photographs. Developing control of the mouse through dragging, clicking and resizing of images to create different effects. Developing understanding of different software tools. Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts. Using word processing software to type and reformat text. Creating and labelling images.	
Using email and internet searches	N/A	Searching and downloading images from the internet safely. Recognising devices that are connected to the internet. Understanding that we are connected to others when using the internet.	Recognising devices that are connected to the internet. Understanding that we are connected to others when using the internet. Searching for appropriate images to use in a document. Understanding what online information is.	
Using data	Representing data through sorting and categorising objects in unplugged scenarios. Representing data through physical pictograms. Exploring branch databases through physical games.	Understanding that technology can be used to represent data in different ways: pictograms, tables, pie charts, bar charts, block graphs etc. Collecting and inputting data into a spreadsheet. Interpreting data from a spreadsheet. Using representations to answer questions about data. Using software to explore and create pictograms and branching databases.	Understanding that technology can be used to represent data in different ways: pictograms, tables, pie charts, bar charts, block graphs etc.	
Wider use of technology	N/A	Learning how computers are used in the wider world.	Recognising common uses of information technology, including beyond school. Understanding some of the ways we can use the internet.	

			Learning how computers are used in the wider world.	
Information Technology				
	Lower Key Stage 2		Upper Key Stage 2	
	Cycle A	Cycle B	Cycle A	Cycle B
Using Software	Building a web page and creating content for it. Use online software for documents, presentations, forms and spreadsheets.	Taking photographs and recording video to tell a story. Using software to edit and enhance their video adding music, sounds and text on screen with transitions.	Using logical thinking to explore software more independently, making predictions based on their previous experience, iterating ideas and testing continuously.	Using logical thinking to explore software more independently, making predictions based on their previous experience, iterating ideas and testing continuously.
	Using software to work collaboratively with others.	Designing and creating a webpage for a given purpose.	Identify ways to improve and edit programs, videos, images etc. Using search and word processing skills to create a presentation.	Identify ways to improve and edit programs, videos, images etc. Using search and word processing skills to create a presentation.
		Building a web page and creating content for it.	Using software programme Sonic Pi/Scratch to create music.	Independently learning how to use 3D design software package TinkerCAD. Creating and editing sound recordings for a specific purpose.
		Using software to work collaboratively with others.	Using video editing software to animate.	Creating and editing videos, adding multiple elements: music, voiceover, sound, text and transitions.
				Using design software TinkerCAD to design a product.
				Creating a website with embedded links and multiple pages.
Use email and internet searches	Understanding why some results come before others when searching.	Learning to log in and out of an email account.	Developing searching skills to help find relevant information on the internet.	Understanding how search engines work
	Using keywords to effectively search for information on the internet.	Writing an email including a subject, 'to' and 'from.'	Learning how to use search engines effectively to find information, focussing on keyword searches and evaluating search returns.	
	Understanding that information found by searching the internet is not all grounded in fact.	Sending an email with an attachment.		
	Searching the internet for data.	Replying to an email.		
Using data	Understanding the vocabulary associated with databases: field, record, data.	N/A	Understanding how barcodes, QR codes and RFID work.	Understanding how data is collected in remote or dangerous places.
			Gathering and analysing data in real time.	Understanding how data might be used to tell us about a location.

	Learning about the pros and cons of digital versus paper databases. Sorting and filtering databases to easily retrieve information. Creating and interpreting charts and graphs to understand data. Understanding that data is used to forecast weather. Recording data in a spreadsheet independently. Sorting data in a spreadsheet to compare using the 'sort by...' option. Designing a device which gathers and records sensor data.		Creating formulas and sorting data within spreadsheets.	
Wider use of technology	Understanding that software can be used collaboratively online to work as a team.	Understanding the purpose of emails. Recognising how social media platforms are used to interact.	Learning about the Internet of Things and how it has led to 'big data'. Learning how 'big data' can be used to solve a problem or improve efficiency. Learn about different forms of communication that have developed with the use of technology.	Learn about different forms of communication that have developed with the use of technology.
Digital Literacy				
Reception	Key Stage 1			
	Cycle A	Cycle B		
Recognising that a range of technology is used for different purposes. Learning to log in and log out.	Learning how to create a strong password. Understanding how to stay safe when talking to people online and what to do if they see or hear something online that makes them feel upset or uncomfortable Identifying whether information is safe or unsafe to be shared online. Learning to be respectful of others when sharing online and ask for their permission before sharing content. Learning strategies for checking if something they read online is true.	Logging in and out and saving work on their own account. When using the internet to search for images, learning what to do if they come across something online that worries them or makes them feel uncomfortable. Understanding how to interact safely with others online. Recognising how actions on the internet can affect others. Recognising what a digital footprint is and how to be careful about what we post.		

	When using the internet to search for images, learning what to do if they come across something online that worries them or makes them feel uncomfortable. Understanding how to interact safely with others online.	Identifying whether information is safe or unsafe to be shared online.	
Digital Literacy			
Lower Key Stage 2		Upper Key Stage 2	
Cycle A	Cycle B	Cycle A	Cycle B
Recognising that information on the internet might not be true or correct and that some sources are more trustworthy than others. Learning to make judgements about the accuracy of online searches. Identifying forms of advertising online. Recognising what appropriate behaviour is when collaborating with others online. Reflecting on the positives and negatives of time spent online. Identifying respectful and disrespectful online behaviour.	Recognising that different information is shared online including facts, beliefs and opinions. Learning how to identify reliable information when searching online. Learning how to stay safe on social media. Considering the impact technology can have on mood. Learning about cyberbullying. Learning that not all emails are genuine, recognising when an email might be fake and what to do about it.	Learning about the positive and negative impacts of sharing online. Learning strategies to create a positive online reputation. Understanding the importance of secure passwords and how to create them. Learning strategies to capture evidence of online bullying in order to seek help. Recognising that updated software can help to prevent data corruption and hacking. Recognising that information on the internet might not be true or correct and learning ways of checking validity.	Identifying possible dangers online and learning how to stay safe. Evaluating the pros and cons of online communication. Recognising that information on the internet might not be true or correct and learning ways of checking validity. Learning what to do if they experience bullying online. Learning to use an online community safely. Using search engines safely and effectively. Understanding the importance of secure passwords and how to create them.

Progression of Knowledge: Disciplinary Knowledge

Creating Media

Reception	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2	
	Cycle A only	Cycle B only	Cycle A	Cycle B
N/A	To understand that holding the camera still and considering angles and light are important to take good pictures. To know that you can edit, crop and filter Photographs. To know how to search safely for images online. To understand that an animation is made up of a sequence of photographs. To know that small changes in my frames will create a smoother looking animation. To understand what software creates simple animations and some of its features e.g. onion skinning.	To know that different types of camera shots can make my photos or videos look more effective. To know that I can edit photos and videos using film editing software. To understand that I can add transitions and text to my video. To know some of the features of web design software. To know that a website is a collection of pages that are all connected. To know that websites usually have a homepage and subpages as well as clickable links to new pages, called hyperlinks. To know that websites should be informative and interactive.	To understand that stop motion animation is an animation filmed one frame at a time using models, and with tiny changes between each photograph. To know that decomposition of an idea is important when creating stop-motion animations. To know that editing is an important feature of making and improving a stop motion animation.	To know that radio plays are plays where the audience can only hear the action so sound effects are important. To know that sound clips can be recorded using sound recording software. To know that sound clips can be edited and trimmed.

Computing Systems and Networks

Reception	Key Stage 1	Lower Key Stage 2		Upper Key Stage 2	
	Cycle A only	Cycle A	Cycle B	Cycle A	Cycle B
To be able to understand what a computer keyboard is and recognising some letters and numbers. To know that a mouse can be used to click, drag and create simple drawings. To know that to use a computer	To know that "log in and log out" means to begin and end a connection with a computer. To know that a computer and mouse can be used to click, drag, fill and select and also add backgrounds, text, layers, shapes and clip art. To know that passwords are important for security. To know that when we create something on a computer it can be more easily saved and shared than a paper version. To know some of the simple graphic design features of a piece of online software.	To understand that software can be used collaboratively online to work as a team. To know what type of comments and suggestions on a collaborative document can be helpful. To know that you can use images, text, transitions and animation in presentations. To know what a tablet is and how it is different from a laptop/desktop computer.	To know what a tablet is and to understand that email stands for 'electronic mail'. To know that an attachment is an extra file added to an email. To understand that emails should contain appropriate and respectful content. To know that cyberbullying is bullying using electronics such as a computer or phone.	To know how search engines work. To understand that anyone can create a website and therefore we should take steps to check the validity of websites. To know that web crawlers are computer programs that crawl through the internet. To understand what copyright is.	To know the difference between ROM and RAM. To understand the importance of having a secure password and what "brute force hacking" is. To know that the first computers were created at Bletchley Park to crack the Enigma code to help the war effort in World War 2. To know about some of the historical figures that contributed to technological advances in computing.

you need to log in to it and then log out at the end of your session. To know that different types of technology can be found at home and in school. To know that you can take simple photographs with a camera or iPad. To know that you must hold the camera still and ensure the subject is in the shot to take a photo.	To know the difference between a desktop and laptop computer. To know that people control technology. To know that buttons are a form of input that give a computer an instruction about what to do (output). To know that computers often work together. To know that touch typing is the fastest way to type. To know that I can make text a different style, size and colour. To know that "copy and paste" is a quick way of duplicating text.	To understand what a network is and how a school network might be organised. To know that a server is central to a network and responds to requests made. To know how the internet uses networks to share files. To know that a router connects us to the internet. To know what a packet is and why it is important for website data transfer. To know the roles that inputs and outputs play. To know what some of the different components inside a computer are e.g. CPU, RAM, hard drive, and how they work together.			To understand what techniques are required to create a presentation using appropriate software.
Programming					
Reception	Key Stage 1		Lower Key Stage 2	Upper Key Stage 2	
	Cycle A	Cycle B	Cycle B only	Cycle A	Cycle B
To know that being able to follow and give simple instructions is important in computing. To understand that it is important for	To understand the basic functions of a Bee-Bot. To know that you can use a camera/tablet to make simple videos. To know that algorithms move a bee-bot accurately to a chosen destination. To understand what machine learning is and how that enables computers to make predictions.	To understand that an algorithm is when instructions are put in an exact order. To know that input devices get information into a computer and that output devices get information out of a computer.	To know that Scratch is a programming language and some of its basic functions. To understand how to use loops to improve programming. To understand how decomposition is used in programming.	To know that there are text-based programming languages such as Logo and Python. To know that nested loops are loops inside of loops. To understand the use of random numbers and remix Python code.	To know that a Micro:bit is a programmable device. To know that Micro:bit uses a block coding language similar to Scratch. To understand and recognise coding structures including variables.

instructions to be in the right order. To understand why a set of instructions may have gone wrong. To know that you can program a Bee-Bot with some simple commands. To understand that debugging means how to fix some simple programming errors. To understand that an algorithm is a set of clear and precise instructions.	To know that loops in programming are where you set a certain instruction (or instructions) to be repeated multiple times. To know that abstraction is the removing of unnecessary detail to help solve a problem.	To understand that decomposition means breaking a problem into manageable chunks and that it is important in computing. To know that we call errors in an algorithm 'bugs' and fixing these 'debugging'. To know that coding is writing in a special language so that the computer understands what to do. To understand that the character in ScratchJr is controlled by the programming blocks. To know that you can write a program to create a musical instrument or tell a joke.	To understand that you can remix and adapt existing code. To understand that a variable is a value that can change (depending on conditions) and know that you can create them in Scratch. To know what a conditional statement is in programming. To understand that variables can help you to create a quiz on Scratch. To know that combining computational thinking skills (sequence, abstraction, decomposition etc) can help you to solve a problem. To understand that pattern recognition means identifying patterns to help them work out how the code works. To understand that algorithms can be used for a number of purposes e.g. animation, games design etc.	To know that a soundtrack is music for a film/video and that one way of composing these is on programming software. To understand that using loops can make the process of writing music simpler and more effective. To know how to adapt their code while performing their music.	To know what techniques to use to create a program for a specific purpose (including decomposition)
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Data Handling

Reception	Key Stage 1	Lower Key Stage 2	Upper Key Stage 2	
	Cycle A only	Cycle A only	Cycle A	Cycle B
To know that sorting objects into various categories can help you locate information. To know that using yes/no questions to find an answer is a branching database.	To know how that charts and pictograms can be created using a computer. To understand that a branching database is a way of classifying a group of objects. To know that computers understand different types of 'input'. To understand that you can enter simple data into a spreadsheet.	To know that a database is a collection of data stored in a logical, structured and orderly manner. To know that computer databases can be useful for sorting and filtering data. To know that different visual representations of data can be made on a computer.	To know that data contained within barcodes and QR codes can be used by computers. To know that infrared waves are a way of transmitting data. To know that Radio Frequency Identification (RFID) is a more private way of transmitting data.	To know that Mars Rover is a motor vehicle that collects data from space by taking photos and examining samples of rock. To know what numbers using binary code look like and be able to identify how messages can be sent in this format. To understand that RAM is Random Access Memory and acts as the computer's working memory.

To know that a pictogram is a way of showing information.	To understand what steps to create an algorithm. To know what data to use to answer certain questions. To know that computers can be used to monitor supplies.	To know that computers can use different forms of input to sense the world around them so that they can record and respond to data. This is called 'sensor data'. To know that a weather machine is an automated machine that responds to sensor data. To understand that weather forecasters use specific language, expression and pre-prepared scripts to help create weather forecast films.	To know that data is often encrypted so that even if it is stolen it is not useful to the thief. To know that data can become corrupted within a network but this is less likely to happen if it is sent in 'packets'. I know that devices or that are not updated are most vulnerable to hackers. To know the difference between mobile data and WiFi.	To know what simple operations can be used to calculate bit patterns.
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Online Safety

Reception	Key Stage 1		Lower Key Stage 2		Upper Key Stage 2	
	Cycle A	Cycle B	Cycle A	Cycle B	Cycle A	Cycle B
N/A	To understand the difference between online and offline. To understand what information I should not post online. To know what the techniques are for creating a strong password. To know that you should ask permission from others before sharing about them online and that they have the right to say 'no.' To understand that not everything I see or read online is true.	To know that the internet is many devices connected to one another. To know that you should tell a trusted adult if you feel unsafe or worried online. To know that people you do not know on the internet (online) are strangers and are not always who they say they are. To know that to stay safe online it is important to keep personal information safe. To know that 'sharing' online means giving something specific to someone else via the	To understand some of the methods used to encourage people to buy things online. To understand that technology can be designed to act like or impersonate living things. To understand that technology can be a distraction and identify when someone might need to limit the amount of time spent using technology. To understand what behaviours are appropriate in order to stay safe and be respectful online.	To know that not everything on the internet is true: people share facts, beliefs and opinions online. To understand that the internet can affect your moods and feelings. To know that privacy settings limit who can access your important personal information, such as your name, age, gender etc. To know what social media is and that age restrictions apply.	To know that a 'digital footprint' means the information that exists on the internet as a result of a person's online activity. To know what steps are required to capture bullying content as evidence. To understand that it is important to manage personal passwords effectively. To understand what it means to have a positive online reputation.	To know different ways we can communicate online. To understand how online information can be used to form judgements. To understand some ways to deal with online bullying. To know that apps require permission to access private information and that you can alter the permissions. To know where I can go for support if I am being bullied online or feel that my health is being affected by time online.

		internet and 'posting' online means placing information on the internet.			To know some common online scams.	
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