Computing: Progression of Skills and Knowledge

EYFS

	Computing Systems and Networks 1: Using a computer	Programming 1: All about instructions	Computing systems and networks 2: Exploring hardware	Data handling: Introduction to data	Online Safety Taught through discussion, stories and scenario PowerPoints
Physical Development	• Develop their small motor skills so that they can use a range of tools competently, safely and confidently.	• Know and talk about the different factors that support their overall health and wellbeing. • Further develop the skills they need to manage the school day successfully.	• Develop their small motor skills so that they can use a range of tools competently, safely and confidently. • Confidently and safely use a range of large and small apparatus indoors and outside, alone and in a group.		
Communication and Language		• Understand how to listen carefully and why listening is important. • Describe events in some detail. • Use talk to help work our problems and organise thinking and activities, and to explain how things work and why they might happen.	• Learn new vocabulary. • Use new vocabulary throughout the day. • Ask questions to find out more and to check they understand what has been said to them. • Articulate their thoughts and ideas in well-formed sentences. • Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen.	• Articulate their thoughts and ideas in well-formed sentences. • Use talk to help work out problems and organise thinking and activities, and to explain how things work and why they might happen. • **ELG: Listening, Attention and Understanding -** Listen attentively and respond to what they hear with relevant questions, comments and actions when being read to and during whole class discussions and small group interactions. • **ELG: Listening, Attention and Understanding** - Make comments about what they have heard and ask questions to clarify their understanding. • **ELG: Speaking** - Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary.	
Personal, Social, Emotional Development		• **ELG: Self-Regulation** - Give focused attention to what the teacher says, responding appropriately even when engaged in activity, and show an ability to follow instructions involving several ideas or actions. • **ELG: Managing Self** - Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. • **ELG: Building Relationships** - Work and play cooperatively and take turns			

		with others.			
Literacy	• Spell words by identifying the sounds and then writing the sounds with letter/s. -Re-read what they have written to check that it makes sense.				
Mathematics	• Link the number symbol (numeral) with its cardinal number value.			• Count objects, actions and sounds. • Subitise. • Count beyond 10. • Compare numbers. • Understand the 'one more than/ one less than' relationship between consecutive numbers. • Continue, copy and create repeating patterns. • Compare length, weight and capacity.	•
Understanding the World			• Describe what they see, hear and feel whilst outside.		

KS1 & KS2 Progression of Skills and Knowledge

	Computing systems and Networks	Programming	Creating Media	Data Handling	Online Safety
Year 1	**Improving mouse skills** Use technology purposefully to create, organise, store, manipulate and retrieve digital content (DL) Recognise common uses of information technology beyond school (IT) 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 (DL)	**Algorithms Unplugged** Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions (CS) Create and debug simple programs (CS) Use logical reasoning to predict the behaviour of simple programs (CS) **BeeBot** Understand what algorithms are; how they are implemented as programs on	**Digital Imagery** Use logical reasoning to predict the behaviour of simple programs (CS) Use technology purposefully to create, organise, store, manipulate and retrieve digital content (DL) Recognise common uses of information technology beyond school (IT) **Key Skills:** • Learning how to explore and tinker with hardware to find out how it works. • Learning where keys are located on the keyboard.		**Online Safety** Recognise common uses of information technology beyond school (IT) 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 (DL) **Key Skills:** • Recognising devices that are connected to the internet. • Understanding that we are connected to others when using the internet.

Key Skills:
- Learning how to explore and tinker with hardware to find out how it works.
- Learning where keys are located on the keyboard.
- Using a basic range of tools within graphic editing software.
- Developing control of the mouse through dragging, clicking and resizing of images to create different effects.
- Developing understanding of different software tools.
- Recognising devices that are connected to the internet.
- Logging in and out and saving work on their own account.

Key Knowledge:
- "log in" and "log out" means to begin and end a connection with a computer
- A computer and mouse can be used to click, drag, fill and select and also add backgrounds, text, layers, shapes and clip art.
- Passwords are important for security and to keep us safe.

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

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digital devices; and that programs execute by following precise and unambiguous instructions (CS)

Create and debug simple programs (CS)

Use logical reasoning to predict the behaviour of simple programs (CS)

Key Skills:
- Recognising that some devices are input devices and others are output devices.
- Learning that decomposition means breaking a problem down into smaller parts.
- Using decomposition to solve unplugged challenges.
- Developing the skills associated with sequencing in unplugged activities.
- Following a basic set of instructions.
- Assembling instructions into a simple algorithm.
- Learning to debug instructions when things go wrong.
- Learning to debug an algorithm in an unplugged scenario.

Key Knowledge:
- To understand that an algorithm is when instructions are put in an exact order.
- To understand that decomposition means breaking a problem into manageable chunks and that it is important in computing.
- 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'.

Vocabulary:
Algorithm Automatic Bug Chunks
Clear Code Debug Decompose
Decomposition Device Directions
Input Instructions Manageable

- Learning how to operate a camera to take photos and videos.
- Developing the skills associated with sequencing in unplugged activities.
- 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.
- Searching and downloading images from the internet safely.
- 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.

Key Knowledge:
- To understand that holding the camera or device 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.

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

- Understanding some of the ways we can use the internet.
- 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.
- To be able to recognise what a digital footprint is and how to be careful about posting online.

Key Knowledge:
- To know that the internet is many devices connected to one another.
- To know what to do if you feel unsafe or worried online – tell a trusted adult.
- 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 internet and 'posting' online means placing information on the internet.

Vocabulary:
Communicate Connect Connection
Consoles Devices Digital footprint
Emotion Feelings Instructions
Internet Internet safety Laptop
Mood Online Personal information
Phone Posting Respect Sharing
Smartphone Smart TV Smartwatch
Strangers Tablet Trust Wired Wireless

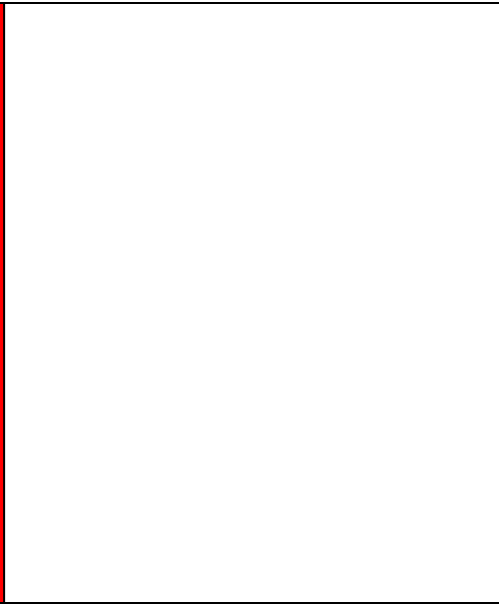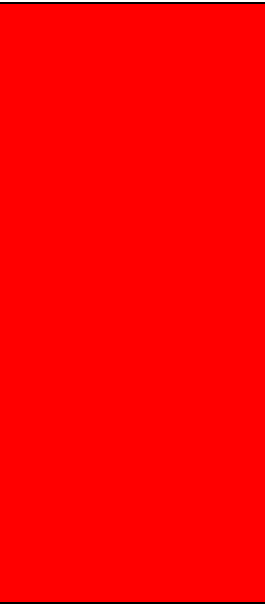|		Motion Order Organise Output Precise Programming Problem Robot Sensor Sequence Solution Specific Steps			
Year 2	**What is a computer?** Use logical reasoning to predict the behaviour of simple programs (CS) Use technology purposefully to create, organise, store, manipulate and retrieve digital content (DL) Recognise common uses of information technology beyond school (IT) **Key Skills:** • Understanding what a computer is and that it's made up of different components. • Recognising that buttons cause effects and that technology follows instructions. • Learning how we know that technology is doing what we want it to do via its output. • Using greater control when taking photos with cameras, tablets or computers. • 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. • Learning how computers are used in the wider world **Key Knowledge:** • To know the difference between a desktop and laptop computer. • To know that people control technology. • To know some input devices that give a computer an instruction about what to do (output). • To know that computers often work together.	**Algorithms and debugging** Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions (CS) Create and debug simple programs (CS) Use logical reasoning to predict the behaviour of simple programs (CS) **Key Skills:** • Developing confidence with the keyboard and the basics of touch typing. • Articulating what decomposition is. • Decomposing a game to predict the algorithms used to create it. • Learning that there are different levels of abstraction. • 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. • Using logical thinking to explore software, predicting, testing and explaining what it does. • Using an algorithm to write a basic computer program. • Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts. **Key Knowledge:** • To understand what machine learning is and how it enables computers to make predictions. • 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.		**International Space Station** Use technology purposefully to create, organise, store, manipulate and retrieve digital content (DL) **Key skills** • Developing confidence with the keyboard and the basics of touch typing. • Creating and labelling images. • Collecting and inputting data into a spreadsheet. • Interpreting data from a spreadsheet. • Learning how computers are used in the wider world. **Key knowledge** • To understand that you can enter simple data into a spreadsheet. • To understand what steps you need to take to create an algorithm. • To know what data to use to answer certain questions. • To know that computers can be used to monitor supplies. **Key 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	**Online Safety** Use technology purposefully to create, organise, store, manipulate and retrieve digital content (DL) Recognise common uses of information technology beyond school (IT) 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 (DL) **Key skills** • Identifying whether information is safe or unsafe to be shared online. • Learning how to create a strong password. • 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. • 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. **Key knowledge** • 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. **Key vocabulary** Accept Comment Consent Content Deny Emojis Offline Online Password Permission Personal information Pop ups Pressure

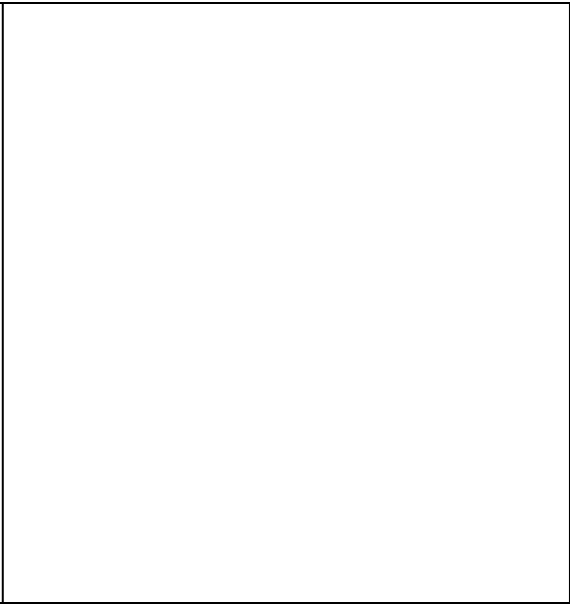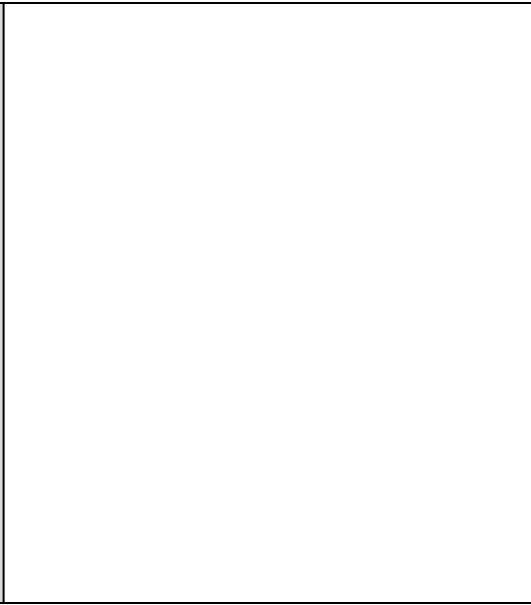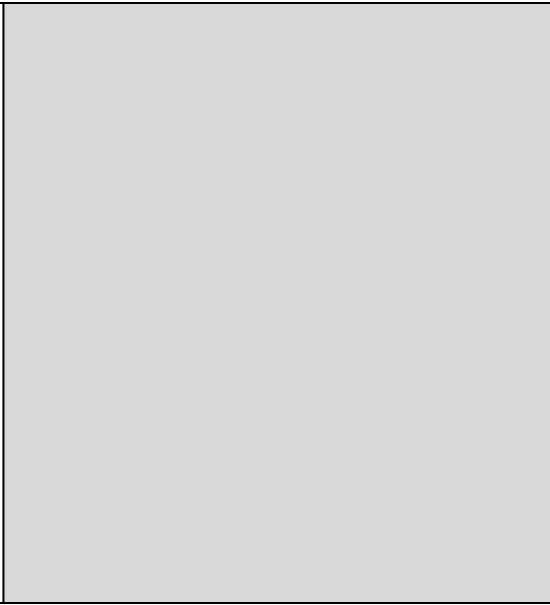|					Private information Reliable Share Terms and conditions Trusted adult

Vocabulary
Battery Buttons Camera
Computer Desktop Device
Digital Digital recorder
Electricity Function Input
Invention Keyboard
Laptop Monitor Mouse Output
Paying till Scanner Screen
System Tablet Technology Video
Wires

Vocabulary
Abstraction Algorithm
Artificial intelligence
Bug Clear Correct Data Debu
Decompose Error Key features
Loop Predict Unnecessary

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Scratch JR

Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions (CS)

Create and debug simple programs (CS)

Use logical reasoning to predict the behaviour of simple programs (CS)

Use technology purposefully to create, organise, store, manipulate and retrieve digital content (DL)

Key knowledge
- 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.

Key skills
- Recognising that buttons cause effects and that technology follows instructio
- 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.
- 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. • Using software (and unplugged means) to create story animations. **Key vocabulary** Algorithm Animation Blocks Bug Button CGI Computer code Code Debug Fluid Icon Imitate Instructions Loop 'On tap' Programming Repeat ScratchJR Sequence Sound recording			

Year 3	Networks and Internet	Scratch	Video Trailers		Online Safety
	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 (DL & IT)

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 (CS & IT)

Journey Inside a Computer

Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts (CS)

Use sequence, selection, and repetition in programs; work with variables and various forms of input and output (CS)

Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs (CS)

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 (CS & IT) | Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts (CS)

Use sequence, selection, and repetition in programs; work with variables and various forms of input and output (CS)

Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs (CS)

Key skills
- Using decomposition to explore the code behind an animation.
- Using repetition in programs.
- Using logical reasoning to explain how simple algorithms work.
- Explaining the purpose of an algorithm.
- Forming algorithms independently.
- 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.

Key knowledge
- 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. | Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts (CS)

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 (CS & IT)

Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content (DL & IT)

Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact (DL)

Key skills
- Using logical thinking to explore more complex software; predicting, testing and explaining what it does.
- Taking photographs and recording video to tell a story.
- Using software to edit and enhance their video adding music and text on screen with transitions.

Key knowledge
- 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.

Key vocabulary
Application Camera angle Clip Cross dissolve Edit Fade to black Fade to | | Understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration (DL & IT)

Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content (DL & IT)

Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact (DL)

Key skills
Recognising how social media platforms are used to interact.
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.
Key knowledge
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.
Key vocabulary
Accurate Age-restricted Autocomplete Beliefs Block Content Digital devices Fact Fake news Internet Opinion Password Persuasive Privacy settings Reliable Report Requests Search engine Security questions Sharing Smart devices Social media platforms Social networking Wellbeing |

	Key skills • Understanding what the different components of a computer do and how they work together. • Drawing comparisons across different types of computers. • Using decomposition to explain the parts of a laptop computer. • Explaining the purpose of an algorithm **Key knowledge** • To know the roles that inputs and outputs play on computers. • To know what some of the different components inside a computer are e.g. CPU, RAM, hard drive, and how they work together. • To know what a tablet is and how it is different from a laptop/desktop computer. 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 Code RAM (random access memory) ROM (read only memory) Storage Tablet device Technology Touchscreen Touchpad	• To understand that you can remix and adapt existing code. **Key vocabulary** Algorithm Animation Application Code Code block Coding application Debug Decompose Interface Game Loop Predict Program Remixing code Repetition code Review Scratch Sprite Tinker	white Film Film editing software Graphics Import Key events Music Photo Plan Recording Slide Sound effects Storyboard Time code Trailer Transition Video Voiceover Wipe		
Year 4	**Collaborative Learning** 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 (DL & IT) 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	**Further Coding with Scratch** Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts (CS) Use sequence, selection, and repetition in programs; work with variables and various forms of input and output (CS) Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs (CS)		**Investigating Weather** Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts (CS) Use sequence, selection, and repetition in programs; work with variables and various forms of input and output (CS) Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content (DL & IT)	**Online Safety** Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact (DL) **Key skills** • Understanding why some results come before others when searching. • Understanding that information found by searching the internet is not all grounded in fact. • Learning to make judgements about the accuracy of online searches. • Identifying forms of advertising online. • Reflecting on the positives and

(CS & IT)

Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact (DL)

Key skills
- Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration.
- Use online software for documents, presentations, forms and spreadsheets.
- Using software to work collaboratively with others.
- Understanding that software can be used collaboratively online to work as a team.
- Recognising what appropriate behaviour is when collaborating with others online.

Key knowledge
- 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 presentation slides.

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

Key skills
- Using decomposition to solve a problem by finding out what code was used.
- Using decomposition to understand the purpose of a script of code.
- Creating algorithms for a specific purpose.
- Coding a simple game.
- Incorporating variables to make code more efficient.
- Remixing existing code.

Key knowledge
- 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.

Key vocabulary
Broadcast block Cod e blocks Conditional Coordinates Decomposition Features Game Information Negative numbers Orientation Parameters Position Program Project Script Sprite Stage Tinker Variables

Computational Thinking
Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts (CS)

Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs (CS)

Key skills
- Using decomposition to solve a problem by finding out what code was used.
- Using decomposition to understand the purpose of a script of code.

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 (CS & IT)

Key skills
- Using tablets or digital cameras to film a weather forecast.
- Understanding that weather stations use sensors to gather and record data that predicts the weather.
- Using keywords to effectively search for information on the internet.
- Searching the internet for data.
- Designing a device that gathers and records sensor data.
- Recording data in a spreadsheet independently.
- Sorting data in a spreadsheet to compare using the 'sort by…' option.
- Understanding that data is used to forecast weather.

Key knowledge
- To know that computers can use different forms of input to sense the world around them so that they can record and respond to data ('sensor data').
- To know that a weather machine is an automated machine that respond to sensor data.
- To understand that weather forecasters use specific language, expression and pre-prepared scripts to help create weather forecast films.

Accurate Backdrop Climate zone Cold Collaboration Condensation Cylinder Degrees Evaporation Extreme weather   Forecast Heat sensor Lightning Measurement Pinwheel Presenter Rain Satellite Script Sensitive Sensor data Solar panel Tablet/Digital camera Temperature

negatives of time online.
- Identifying respectful and disrespectful online behaviour.
- Recognising that information on the Internet might not be true or correct and that some sources are more trustworthy than others

Key knowledge
- 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.

Key vocabulary
Accuracy Advantages Advertisements Belief Bot Chatbot Computer Distractions Fact Hashtag Implications In-app purchases Influencer Opinion Program Recommendations Reliable Risks Screen time Search results Snippets Sponsored Trustworthy

		• Identifying patterns through unplugged activities. • Using past experiences to help solve new problems. • Using abstraction to identify the important parts when completing both plugged and unplugged activities. • Creating algorithms for a specific purpose. • Using abstraction and pattern recognition to modify code. **Key knowledge** • To know that combining computational thinking skills 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. **Key vocabulary** Abstraction Algorithm Code Computational thinking Decomposition Input Logical reasoning Output Pattern recognition Script Sequence Variable		Thermometer Tornado Warm Weather Weather forecast Wind	
Year 5	**Search Engines** Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content (DL & IT) 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 (CS & IT) Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact (DL)	**Programming Music** Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts (CS) Use sequence, selection, and repetition in programs; work with variables and various forms of input and output (CS) Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs (CS) 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,	**Stop Motion Animation** Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts (CS) Use sequence, selection, and repetition in programs; work with variables and various forms of input and output (CS) **Key skills** • Decomposing animations into a series of images. • Decomposing a story to be able to plan a program to tell a story. • Using video editing software to animate. **Key knowledge** • To know that decomposition of an idea is important when creating stop-motion animations. • To understand that stop motion	**Mars Rover 1** 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 (DL & IT) Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content (DL & IT) **Key skills** • Learning that external devices can be programmed by a separate computer. • Recognising how the size of RAM affects the processing of data. • Learning the vocabulary associated with data: data and transmit • Recognising that computers transfer data in binary and understanding	**Online safety** 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 (DL & IT) Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact (DL) **Key skills** Pupils who are secure will be able to: • Understand that passwords need to be strong and that apps require some form of passwords. • Recognise a couple of the different types of online communication and know who to go to if they need help with any communication matters online.

Key skills
- Developing searching skills to help find relevant information on the internet.
- Learning how to use search engines effectively to find information, focussing on keyword searches and evaluating search returns.
- Learn about different forms of communication that have developed with the use of technology.
- Recognising that information on the Internet might not be true or correct and learning ways of checking validity.

Key knowledge
- 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.

Key vocabulary
Algorithm Appropriate Copyright Correct Credit Data leak Deceive Fair Fake Inappropriate Incorrect Index Information Keywords Network Privacy Rank Real Search engine TASK Web crawler Website

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analysing, evaluating and presenting data and information (CS & IT)

Key skills
- Predicting how software will work based on previous experience.
- Writing more complex algorithms for a purpose.
- Iterating and developing their programming as they work.
- Confidently using loops in their 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.
- Amending code within a live scenario.
- Using logical thinking to explore software more independently, making predictions based on their previous experience.
- Using a software programme (Scratch) to create music.
- Identify ways to improve and edit programs, videos, images etc.

Key knowledge
- 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 music while performing

Key vocabulary
Beat Bugs Coding Command Debug Decompose Error Instructions Loop Melody Mindmap Music Output Performance Pitch Plan Play Predict Programming Repeat Rhythm Scratch Soundtrack Spacing Tempo Timbre Tinker Tutorials Typing

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animation is an animation filmed one frame at a time using models, and with tiny changes between each photograph.
- To know that editing is an important feature of making and improving a stop motion animation.

Key vocabulary
Animation Animator Background Character Decomposition Design Digital device Edit Evaluate Flip book Fluid movement Frames Model Moving images Onion skinning Still images Stop motion Storyboard Thaumatrope Zoetrope

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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 data is collected in remote or dangerous places.
- Understanding how data might be used to tell us about a location.
- Learn about different forms of communication that have developed with the use of technology.

Key knowledge
- 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 what simple operations can be used to calculate bit patterns.

Key vocabulary
8-bit binary Addition ASCII Binary code Boolean Byte Communicate Construction CPU Data transmission Decimal numbers Design Discovery Distance Hexadecimal Input Instructions Internet Mars Rover Moon Numerical data Output Planet Radio signal RAM Research Scientist Sequence Signal Simulation Space Subtraction Technology

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- Search for simple information about a person, such as their birthday or key life moments.
- Know what bullying is and that it can occur both online and in the real world.
- Recognise when health and wellbeing are being affected in either a positive or negative way through online use.
- Offer a couple of advice tips to combat the negative effects of online use.

Key knowledge
- 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.

Key vocabulary
Accurate information Advice App permissions Application Apps Bullying Communication Emojis Health In-app purchases Information Judgement Memes Mental health Mindfulness Mini-biography Online communication Opinion Organisation Password Personal information Positive contributions Private information Real world Strong password Summarise Support Technology Trusted adult Wellbeing

	Bletchley Park	Intro to Python	History of computers	Big Data 1	Online Safety
Year 6	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts (CS) Use sequence, selection, and repetition in programs; work with variables and various forms of input and output (CS) Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs (CS) Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content (DL & IT) 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 (CS & IT) Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact (DL) **Key skills** • Learning about the history of computers and how they have evolved over time. • Using past experiences to help solve new problems. • Writing increasingly complex algorithms for a purpose. • Debugging quickly and effectively to make a program more efficient.	Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts (CS) Use sequence, selection, and repetition in programs; work with variables and various forms of input and output (CS) **Key skills** • Decomposing a program into an algorithm. • Writing increasingly complex algorithms for a purpose. • 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. Using logical thinking to explore software independently, iterating ideas and testing continuously. **Key knowledge** • 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. **Key vocabulary** Algorithm Code Command Design Import Indentation Input Instructions Loop Output Patterns Random Remix Repeat Shape	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 (DL & IT) Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content (DL & IT) 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 (CS & IT) **Key skills** • 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. • Using search and word processing skills to create a presentation. • Planning, recording and editing a radio play. • Creating and editing sound recordings for a specific purpose. **Key knowledge** • 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. **Vocabulary** Background noise Byte Computer Devices File FX Gigabyte Graphic Hard drive Hardware Kilobytes Megabyte Memory storage Mouse Operating system Overlay Play Processo Radio play RAM Raspberry Pi Record Reverb ROM Script Smartphone Sound Sound effects Terrabytes Touch	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 (DL & IT) 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 (CS & IT) **Key skills** • Understanding and identifying barcodes, QR codes and RFID. • Identifying devices and applications that can scan or read barcodes, QR codes and RFID. • Understanding how barcodes, QR codes and RFID work. • Gathering and analysing data in real time. • Creating formulas and sorting data within spreadsheets. • Learning how 'big data' can be used to solve a problem or improve efficiency. **Key knowledge** • 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 data is often encrypted so that even if it is stolen it is not useful to the thief. **Key vocabulary** Algorithms Barcode Binary Boolean Brand Chips Commuter Contactless Data Encrypted Infrared MagicBand Privacy Proximity QR code QR scanner Radio waves RFID Signal Systems/data analyst Transmission Wireless	Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact (DL) **Key skills** • 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. **Key knowledge** • 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 some common online scams. **Key vocabulary** Anonymity Antivirus Biometrics Block and report Consent Copy Digital footprint Digital personality Financial information Hacking Inappropriate Online bullying Online reputation Password Paste Personal information Personality Phishing Privacy settings Private Reliable source Report Reputation Respect Sammers Screengrab Secure Settings Software updates factor authentication URLUsername

		screen Track Trackpad Trailer		
• Remixing existing code to explore a problem. • Changing a program to personalise it. • Evaluating code to understand its purpose. • Predicting code and adapting it to a chosen purpose. • Using search and word processing skills to create a presentation. • Understanding how search engines work. • Understanding the importance of secure passwords and how to create them. • Using search engines safely and effectively. **Key knowledge** • 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. • To understand what techniques are required to create a presentation using appropriate software. **Key vocabulary** Acrostic Code Brute force hacking Caesar cipher Chip and pin system Cipher Code Combination Contribute Convince Date shift cipher Discovery Hero Invention Nth Letter Cipher Password Pig Latin Pigpen cipher Present Scrambled Secret Secure Technological advancement Trial and error				

"Think big, think differently and always creatively"

Haverigg Primary School