KS1 Computing Progression of Knowledge and Skills

Year 1	Year 2
Computer Science strand 1: Hardware	
SKILLS: ➢ 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.	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 confidence with the keyboard and the basics of touch typing.
Computer Science strand 2: Networks and data representation	
N/A	N/A
Computer Science strand 3: Computational thinking	
SKILLS: ➢ Learning that decomposition means breaking a problem down into smaller parts. ➢ 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. Assembling instructions into a simple algorithm	SKILLS: ➢ 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.
Computer Science strand 4: Programming	

SKILLS:	KNOWLEDGE:	SKILLS:	KNOWLEDGE:
➢ Programming a Floor robot to follow a planned route. ➢ Learning to debug instructions when things go wrong. ➢ Using programming language to explain how a floor robot works. ➢ Learning to debug an algorithm in an unplugged scenario.	➢ 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 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 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.	➢ 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.	➢ To understand what machine learning is and how that 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. ➢ 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.

Information Technology strand 1: Using software

SKILLS:	SKILLS:
➤ 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. ➤ Using software (and unplugged means) to create story animations. ➤ Creating and labelling images.

Information Technology strand 2: Using email and internet searches

SKILLS:	SKILLS:
➤ Recognising devices that are connected to the internet. ➤ Searching and downloading images from the internet safely. ➤ 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.

Information Technology strand 3: Using data

SKILLS:	KNOWLEDGE:	SKILLS:	KNOWLEDGE:
➤ Understanding that technology can be used to represent data in different ways: pictograms, tables, pie charts, bar charts, block graphs etc. ➤ Using representations to answer questions about data. ➤ Using software to explore and create pictograms and branching databases.	➤ 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'.	➤ Collecting and inputting data into a spreadsheet. ➤ Interpreting data from a spreadsheet.	➤ 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.

Information Technology strand 4: Wider use of technology

SKILLS:	SKILLS:
➤ 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.

Digital Literacy

SKILLS:	SKILLS:
➤ 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.	➤ 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.

Computing Systems and Networks

KNOWLEDGE:	KNOWLEDGE:
➤ 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 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.

Creating Media

KNOWLEDGE:
- 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

KNOWLEDGE:
- 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.

Online Safety

KNOWLEDGE:
- 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 internet and 'posting' online means placing information on the internet.

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.

Unit	Year 1 - Key Vocabulary
Computing systems and networks: Improving mouse skills	account, click, **ctrl**, **cursor**, drag, drag and drop, **digital photograph**, drop, **duplicate**, keyboard, **layers**, log on/ in, log out/ off, menu, mouse, mouse pointer, password, right click, screen (monitor), software, **tool**, username
Programming 1: Algorithms unplugged	algorithm, **automatic**, bug, **chunks, clear, code**, debug, **decompose, decomposition**, device, directions, **input**, instructions, **manageable, motion, order, organise, output, precise**, programming, problem, **robot, sensor**, sequence, **solution, specific, steps, tasks, virtual assistant**
Skills showcase: Rocket to the moon	**annotate, cells, components, create, data**, debug, **designing, digital content, digital image, document, e-document, edit, editing program, evaluate, folder**, input, instructions, log in, photo, program, order, robot, **save**, sequence, **share, software, spreadsheet, table**
Programming 2: Bee-Bots	algorithm, **artificial intelligence**, Bee-Bot, clear, code, debug, **demonstration, filming**, inputting, instructions, **pause**, precise, **predict, program, tinker, video, video recording** (Option 2 only: **emulator, virtual**)
Creating media: Digital imagery	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**
Data handling: Introduction to data	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**
Online safety	communicate, **connect, console**, devices, **digital footprint, emotion, feelings**, instructions, internet, **internet safety, laptop, mood**, online, **personal information, phone**, posting, predict, **respect, sharing, smart device, smartphone, smart TV, smartwatch, strangers**, tablet, **trust, wired, wireless**

Unit	Year 2 - Key Vocabulary
Computing systems and networks 1: What is a computer?	**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
Programming 1: Algorithms and debugging	**abstraction**, algorithm, artificial intelligence, bug, clear, correct, data, debug, decompose, error, **key features, loop**, predict, **unnecessary**
Computing systems and networks 2: Word processing	**backspace, bold, copy, copyright, cut**, delete, **forward button, highlight, home row, home screen**, image, import, **italics**, keyboard, **keyboard character**, keyword, layout, navigate, paste, redo, search, **space bar, text, text effects, touch typing, underline, undo, word processing**
Programming 2: Scratch Jr	algorithm, animation, **blocks**, bug, button, **CGI, computer code**, code (verb), debug, **fluid, icon, imitate**, instructions, loop, 'on tap', programming, repeat, **Scratch JR**, sequence, sound recording
Creating media: Stop motion	Animation, animator, background, **digital device**, drawing, **flipbook, frames, moving images, opinion skinning, still images** (Option 1- as above, plus: decompose, **object, plan**) (Option 2- as above, plus: decompose, digital camera, **duration, focus**, import, object, plan, save, **upload**) (Option 3- as above, plus: debug, effects, evaluate, **fluid, pen tool, static**)
Data handling: International space station	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	accept, **comment, consent, content, deny, emojis, offline**, online, password, **permission**, personal information, **pop-ups, pressure**, private information, **reliable**, share, **terms and conditions, trusted adult**

LKS2 History Progression of Knowledge

Year 3	Year 4

Computer Science strand 1: Hardware

SKILLS: ➤ Understanding what the different components of a computer do and how they work together. ➤ Drawing comparisons across different types of computers. Learning about the purpose of routers.	SKILLS: ➤ 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.

Computer Science strand 2: Networks and data representation

SKILLS: ➤ 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.	SKILLS: ➤ Understanding that computer networks provide multiple services, such as the World Wide Web, and opportunities for communication and collaboration.

Computer Science strand 3: Computational thinking

SKILLS: ➤ Using decomposition to explain the parts of a laptop computer. ➤ 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.	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. ➤ 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.

Computer Science strand 4: Programming

SKILLS:	KNOWLEDGE:	SKILLS:	KNOWLEDGE:
➤ 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.	➤ 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 understand that you can remix and adapt existing 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.	➤ 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.

Information Technology strand 1: Using software

SKILLS:
- 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.

SKILLS:
- Building a web page and creating content for it.
- Designing and creating a webpage for a given purpose.
- Use online software for documents, presentations, forms and spreadsheets.
- Using software to work collaboratively with others.

Information Technology strand 2: Using email and internet searches

SKILLS:
- Learning to log in and out of an email account.
- Writing an email including a subject, 'to' and 'from.'
- Sending an email with an attachment. Replying to an email.

SKILLS:
- Understanding why some results come before others when searching.
- Using keywords to effectively search for information on the internet.
- Understanding that information found by searching the internet is not all grounded in fact.
- Searching the internet for data.

Information Technology strand 3: Using data

SKILLS:
- Understanding the vocabulary to do with databases: field, record, data.
- 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.

KNOWLEDGE:
- 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.

SKILLS:
- 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.

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. 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.

Information Technology strand 4: Wider use of technology

SKILLS:
- Understanding the purpose of emails.
- Recognising how social media platforms are used to interact.

SKILLS:
- Understanding that software can be used collaboratively online to work as a team.

Digital Literacy

SKILLS:
- 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.

SKILLS:
- 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.

Computing Systems and Networks

KNOWLEDGE:
- To know what a tablet is and how it is different from a laptop/desktop computer.
- 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 on computers.
- 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 what some of the different components inside a computer are e.g. CPU, RAM, hard drive, and how they work together.

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.

Creating Media

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.

KNOWLEDGE:
- 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. .

Online Safety

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 Information, such as your name, age, gender etc.
- To know what social media is and that age restrictions apply.

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.

Unit	Year 3 - Key Vocabulary
Computing systems and networks 1: Networks and the internet	cables, component, connection, **corrupted**, data, desktop, device, **DSL (digital subscriber line)**, **fibre**, file, internet, laptop, **network**, **network map**, **network switch**, **packets**, **radio waves**, router, server, **submarine cables**, tablet, **text map**, **The Cloud**, **web server**, **website**, **website trackers**, **WiFi**, wired, wireless, **Wireless Access Points**, **World Wide Web**
Programming: Scratch	algorithm, animation, **application**, code, code block, **coding application**, debug, decompose, **interface**, game, loop, predict, program, remixing code, repetition code, review, **Scratch**, sprite, tinker
Computing systems and networks 2: Emailing	attachment, bcc (blind carbon copy) cc (carbon copy), **compose**, content, **cyberbullying**, document, **domain**, download, email, **email account**, **email address**, emoji, emotions, **fake**, font, **genuine**, **hacker**, icons, **inbox**, information, **link**, log in, log out, **negative language**, password, personal information, **positive language**, **reply**, **responsible digital citizen**, **scammer**, settings, send, **sign in**, **spam email**, **subject bar**, theme, tone, username, **virus**, WiFi
Computing systems and networks 3: Journey inside a computer	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**
Creating media: Video trailers	application, camera angle, **clip**, edit, **film editing software**, **graphics**, import, key events, photo, plan, recording, **sound effects**, storyboard, **time code**, **trailer**, **transition**, video, **voiceover** (Option 1 - as above, plus: **cross blur, cross fade, cross zoom**, desktop, digital device, **dip to black, directional wipe**, laptop) (Option 2 - as above, plus: **cross dissolve, fade to black/white , slide, wipe**)
Data handling: Comparison cards databases	categorise, category, chart, data, database, **fields , filter**, graph, information, **interpret**, **PDF**, **questionnaire**, record, representation, sort, spreadsheet
Online safety	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**

Unit	Year 4 - Key Vocabulary
Computing systems and networks: Collaborative learning	animations, **average**, bar chart, **collaboration**, comment, **conditional formatting, 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** (Microsoft version add in: **rating**)
Programming 1: Further coding with Scratch	**broadcast block**, code blocks, **conditional, coordinates**, decomposition, **features**, game, information, **negative numbers, orientation, parameters, position**, program, project, **script**, sprite, **stage**, tinker, **variables**
Creating media: Website design	assessment, **audience**, collaboration, content, contribution, create, **design, embed**, evaluate, features, **hyperlinks**, images, insert, online, plan, **progress**, review, **web page**, website, World Wide Web (Google version add in: **checklist, Google Sites, hobby, homepage, published**, record, **style, subpage, tab**, theme) (Microsoft version add in: **design view**, information, **Microsoft Sway, stack, storyline view**, style, **transform, web browser**)
Skills showcase: HTML	code, component, content, copyright, **CSS, end tag**, fake news, **hacking, heading, headline, hex code, HTML**, input, **internet browser**, output, **paragraph**, permission, **remixing**, script, **start tag, tags**, text, **URL**, webpage
Programming 2: Computational thinking	abstraction, algorithm, code, **computational thinking**, decomposition, input, **logical reasoning**, output, **pattern recognition**, script, sequence, variable
Data handling: Investigating weather	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, thermometer, **tornado, warm, weather, weather forecast, wind**
Online safety	**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**

UKS2 History Progression of Knowledge

Year 5	Year 6

Computer Science strand 1: Hardware

SKILLS:	SKILLS:
➢ Learning that external devices can be programmed by a separate computer. ➢ 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. ➢ Understanding and identifying barcodes, QR codes and RFID. ➢ 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).

Computer Science strand 2: Networks and data representation

SKILLS:	SKILLS:
➢ 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.	➢ Understanding that computer networks provide multiple services.

Computer Science strand 3: Computational thinking

SKILLS:	SKILLS:
➢ Decomposing animations into a series of images. ➢ Decomposing a program without support. ➢ Decomposing a story to be able to plan a program to tell a story. ➢ Predicting how software will work based on previous experience. ➢ Writing more complex algorithms for a purpose.	➢ Decomposing a program into an algorithm. ➢ Using past experiences to help solve new problems. ➢ Writing increasingly complex algorithms for a purpose.

Computer Science strand 4: Programming

SKILLS:	KNOWLEDGE:	SKILLS:	KNOWLEDGE:
➢ Programming an animation. 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.	➢ 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 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. ➢ To know what techniques to use to create a program for a specific purpose (including decomposition).	➢ 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. ➢ Predicting code and adapting it to a chosen purpose.	➢ 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.

Information Technology strand 1: Using software

SKILLS:	SKILLS:
➢ Using logical thinking to explore software more independently, making predictions based on their previous experience. ➢ Using software programme Sonic Pi/Scratch to create music. ➢ Using the video editing software to animate. ➢ Identify ways to improve and edit programs, videos, images etc. ➢ Independently learning how to use 3D design software package TinkerCAD.	➢ Using logical thinking to explore software independently, iterating ideas and testing continuously. ➢ Using search and word processing skills to create a presentation. ➢ Creating and editing sound recordings for a specific purpose. ➢ 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.

Information Technology strand 2: Using email and internet searches

SKILLS:	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.	➢ Understanding how search engines work.

Information Technology strand 3: Using data

SKILLS:	KNOWLEDGE:	SKILLS:	KNOWLEDGE:
➢ Understanding how data is collected in remote or dangerous places. ➢ Understanding how data might be used to tell us about a location.	➢ 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.	➢ Understanding how barcodes, QR codes and RFID work. ➢ Gathering and analysing data in real time. ➢ Creating formulas and sorting data within spreadsheets.	➢ 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. ➢ 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.

Information Technology strand 4: Wider use of technology

SKILLS:	SKILLS:
➢ Learn about different forms of communication that have developed with the use of technology.	➢ 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.

Digital Literacy

SKILLS:	SKILLS:
➢ 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	➢ 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. ➢ Using search engines safely and effectively. ➢ Recognising that updated software can help to prevent data corruption and hacking.

Computing Systems and Networks

KNOWLEDGE:	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. ➢ 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. ➢ To understand what techniques are required to create a presentation using appropriate software.

Creating Media

KNOWLEDGE:	KNOWLEDGE:
➢ 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.

Online Safety

KNOWLEDGE:	KNOWLEDGE:
➢ 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. .	➢ 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.

Unit	Year 5 - Key Vocabulary
Computing systems and networks: Search engines	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
Programming 1: Music	beat, **bugs, coding, command**, debug, decompose, error, instructions, loop, **melody, mindmap**, music, output, **performance, pitch, play**, predict, programming, **rhythm, tempo, timbre**, tinker, **tutorials**, typing (Sonic Pi version add in: **buffer**, format, **live loops, rehearsal, repetition, sleep, Sonic Pi, soundtrack, spacing, typo**) (Scratch version add in: plan, repeat, scratch, **soundtrack, spacing**)
Data handling: Mars Rover 1	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, **transmit**
Programming 2: Micro:bit	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, program, repetition, **reset, sabotage, scoreboard**, screen, **systematic**, tablet, **tinkering, USB**, variables, wifi, wireless, wires
Creating media: Stop motion	animation, **animator**, background, **character**, decomposition, design, edit, evaluate, **flip book, fluid movement, frame, model**, moving images, **still image**, storyboard, **thaumatrope, zoetrope** (Option 1 add in: digital device, onion skinning, stop motion) (Option 2 add in: effects, photos, script)
Skills showcase: Mars Rover 2	3D, algorithm, **binary image, CAD, compression**, CPU, data, drag and drop, **"Fetch, decode, execute", ID card**, input, **JPEG**, memory, **online community, operating system**, output, **pixels**, RAM, **responsible, RGB, ROM, safe**
Online safety	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

Unit	Year 6 - Key Vocabulary
Computing systems and networks: Bletchley Park	**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**
Programming: Introduction to Python	algorithm, code, command, design, import, **indentation**, input, instructions, loop, output, patterns, **random, remix**, repeat, **shape**
Data handling 1: Big data 1	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
Creating media: History of computers	**background noise**, byte, computer, devices, file, **FX, gigabyte**, graphics, hard drive, **hardware, kilobytes, megabyte, memory storage**, mouse, operating system, **overlay**, play, **processor, radio play**, RAM, **Raspberry Pi**, record, **reverb**, ROM, script, smartphone, **sound**, sound effects, **terrabytes, touch screen**, track, **trackpad**, trailer
Data handling 2: Big data 2	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**, wifi, wireless
Skills showcase: Inventing a product	**adapt, advert**, algorithm, bugs, coding, **debugging**, design, edit, **electronic**, evaluate, **facts, image rights**, images, **influence**, information, **inputs**, loops, **manipulation, opinions**, output, photos, **product**, program, repetition, **screenshot**, search engine, **selection**, sequence, snippets, software, **structures**, variables, video, website
Online safety	anonymity, antivirus, biometrics, block and report, consent, copy, digital footprint, digital personality, financial information, hacking, inappropriate, malware, online bullying, online reputation, password, paste, personal information, personality, phishing, privacy settings, private, reliable source, report, reputation, respect, scammers, screengrab, secure, settings, software updates, two factor authenication, URL, username