Computing Year 4/5		
Term 1.1 **Computing systems and networks: Search engines**		
Vocab	Knowledge	Outcomes
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	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.	Explain what a search engine is, suggesting several search engines to use and explain how to use them to find websites and information. Suggest that things online aren't always true and recognise what to check for. Explain why keywords are important and what TASK stands for, using these strategies to search effectively. Recognise the terms 'copyright' and 'fair use' and combine text and images in a poster. Make parallels between book searching and internet searching, explaining the role of web crawlers and recognising that results are rated to decide rank.
Term 1.2 **Programming 1: Music**		
Vocab	Knowledge	outcomes
Beat Bugs Coding	To know that a soundtrack is music for a film/video and that one way of composing these is on programming software.	Iterate ideas, testing and changing throughout the lesson. Explain what the basic commands do.

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	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.	Explain how their program links to the theme. Include a loop in their work. Correct their own simple mistakes. Explain their scene in the story. Link musical concepts to their scene. Include a repeat and explain its function to enhance music. Code a piece of music that combines a variety of structures. Use loops in their programming. Recognise that programming music is a way to apply their skills
Term 2.1 **Programming 2: Micro:bit**		
Vocab	Knowledge	Outcomes
Algorithm Animation App Blocks	To know that a Micro:bit is a programmable device. To know that Micro:bit uses a block coding language similar to Scratch.	Clip blocks together and predict what will happen. Make connections with previous programming interfaces they've used, e.g. Scratch.

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	To understand and recognise coding structures including variables. To know what techniques to use to create a program for a specific purpose (including decomposition).	Create their own images to make the animation and recognise the difference between 'on start' and 'forever'. Recognise blocks they've used previously, identifying inputs and outputs used and make predictions about how variables work. Choose appropriate blocks to complete the program and attempt the challenges independently. Break a program down into smaller steps, suggesting appropriate blocks and match the algorithm to the program.

Wifi Wireless Wires		
Term 2.2 **Creating media: Stop motion animation**		
Vocab	Knowledge	Outcomes
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	Create a toy with simple images with a single movement. Create a short stop motion with small changes between images. Think of a simple story idea for their animation then decompose it into smaller parts to create a storyboard with simple characters. Make small changes to the models to ensure a smooth animation and delete unnecessary frames. Add effects such as extending parts and titles. Provide helpful feedback to other groups about their animations.	Create a toy with simple images with a single movement. Create a short stop motion with small changes between images. Think of a simple story idea for their animation then decompose it into smaller parts to create a storyboard with simple characters. Make small changes to the models to ensure a smooth animation and delete unnecessary frames. Add effects such as extending parts and titles. Provide helpful feedback to other groups about their animations.
Term 3.1 **Data handling: Mars Rover 1**		
Vocab	Knowledge	Outcomes
8-bit binary Addition ASCII Binary code	To know that Mars Rover is a motor vehicle that collects data from space by taking photos and examining samples of rock.	Identify some of the types of data that the Mars Rover could collect (for example, photos). Explain how the Mars Rover transmits the data back to Earth and the challenges involved in this.

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	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.	Read any number in binary, up to eight bits. Identify input, processing and output on the Mars Rovers. Read binary numbers and grasp the concept of binary addition. Relate binary signals (Boolean) to a simple character-based language, ASCII.
Term 3.2 **Skills showcase: Mars Rover 2**		

Vocab	Knowledge	Outcomes
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	To understand that bit patterns represent images as pixels. To understand that the data for digital images can be compressed. To know the difference between ROM and RAM. To understand various techniques that will improve the design of a 3D object (using CAD software).	Create a pixel picture, explaining that a pixel is the smallest element of a digital image and that binary is used to code and transfer this data. Save a JPEG as a bitmap and recognise the difference in file size as well as explaining how pixels are used to transfer image data. Explain the 'fetch, decode, execute' cycle in relation to real-world situations. Create a profile with a safe and suitable username and password and begin to use 3D design tools. Independently take tutorial lessons, applying what they have learnt to their design and understand the importance of using an online community responsibly.
Online safety – to be taught throughout the year		
Vocab	Knowledge	Outcomes
Accurate information Advice App permissions Application Apps Bullying Communication Emojis	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. Search for simple information about a person, such as their birthday or key life moments.	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. Search for simple information about a person, such as their birthday or key life moments.

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	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.	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.