# Freeman Computing Topic and Progression Map 2022 onwards

This document shows the keys **skills** covered in each year group from Y1 - Year 6.

| School Values | Curious | Achieve | Resilient | Independent | Nurturing | Gracious |
|---|---|---|---|---|---|---|
| **What do these values look like in Computing?** | Asking questions.<br>Enjoys learning new knowledge and skills.<br>Desire to learn more and improve. | Recognise and celebrate own success.<br>Sets clear goals and challenges.<br>Make expected or better progress. | Have a strong sense of self-belief.<br>Respond to challenge positively.<br>Show determination to succeed. | Attempt new skills and challenges positively.<br>Take ownership of learning.<br>Make decisions.<br>Consistently retrieve/ remember key skills and knowledge. | Be supportive to peers. | Cope with success and difficulty positively. |

| Year 1 | Computing systems and networks | Programming 1 | Programming 2 | Creating media | Online safety |
|---|---|---|---|---|---|
| | ✦Improving mouse skills | ✦Algorithms unplugged | ✦Bee-Bot (1/2) | Digital imagery (G/MO) | |
| **Key knowledge from the unit** | To know that "log in and log out" means to begin and end a connection with a computer. | To understand that an algorithm is when instructions are put in an exact order. | To understand the basic functions of a Bee-Bot. | To understand that holding the camera still and considering angles and light are important to take good pictures. | To know that the internet is many devices connected to one another. |
| | 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 input devices get information into a computer and that output devices get information out of a computer. | To know that you can use a camera/tablet to make simple videos. | To know that you can edit, crop and filter photographs. | To know what to do if you feel unsafe or worried online - tell a trusted adult. |
| | To know that passwords are important for security. | To understand that decomposition means breaking a problem into manageable chunks and that it is important in computing. | To know that algorithms move a Bee-Bot accurately to a chosen destination. | To know how to search safely for images 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 we call errors in an algorithm 'bugs' and fixing these 'debugging'. | | | 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. |

| Year 2 | Computing systems and networks 1 | Programming 1 | Programming 2 | Data handling | Online safety |
|---|---|---|---|---|---|
| | ✦What is a computer? | ✦Algorithms and debugging | ScratchJr | ✦International Space Station | |
| **Key knowledge from the unit** | To know the difference between a desktop and laptop computer. | To understand what machine learning is and how it enables computers to make predictions. | To know that coding is writing in a special language so that the computer understands what to do. | To understand that you can enter simple data into a spreadsheet. | To understand the difference between online and offline. |
| | To know that people control technology. | To know that loops in programming are where you set a certain instruction (or instructions) to be repeated multiple times. | To understand that the character in Scratch Jr is controlled by the programming blocks. | To understand what steps you need to take to create an algorithm. | To understand what information I should not post online. |
| | To know some input devices that give a computer an instruction about what to do (output). | To know that abstraction is the removing of unnecessary detail to help solve a problem. | To know that you can write a program to create a musical instrument or tell a joke. | To know what data to use to answer certain questions. | To know what the techniques are for creating a strong password. |
| | To know that computers often work together. | | | To know that computers can be used to monitor supplies. | 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. |

| Year 3 | Computing systems and networks 1 | Programming | Computing systems and networks 3 | Creating media | Online safety |
|---|---|---|---|---|---|
| | ✦ Networks and the internet | ✦ Scratch | ✦ Journey inside a computer | ✦ Video trailers (1/2) | |
| **Key knowledge from the unit** | To understand what a network is and how a school network might be organised. | To know that Scratch is a programming language and some of its basic functions. | To know the roles that inputs and outputs play on computers. | To know that different types of camera shots can make my photos or videos look more effective. | To know that not everything on the internet is true: people share facts, beliefs and opinions online. |
| | To know that a server is central to a network and responds to requests made. | To understand how to use loops to improve programming. | 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 that I can edit photos and videos using film editing software. | To understand that the internet can affect your moods and feelings. |
| | To know how the internet uses networks to share files. | To understand how decomposition is used in programming. | To know what a tablet is and how it is different from a laptop/desktop computer. | To understand that I can add transitions and text to my video. | To know that privacy settings limit who can access your important personal information such as your name, age, gender etc. |
| | To know that a router connects us to the internet. | To understand that you can remix and adapt existing code. | | | To know what social media is and that age restrictions apply. |
| | To know what a packet is and why it is important for website data transfer. | | | | |

| Year 4 | Computing systems and networks | Programming 1 | Programming 2 | Data handling | Online safety |
|---|---|---|---|---|---|
| | ✦ Collaborative learning | ✦ Further coding with Scratch | ✦ Computational thinking | Investigating weather (G/MO) | |
| **Key knowledge from the unit** | To understand that software can be used collaboratively online to work as a team. | 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 that combining computational thinking skills can help you to solve a problem. | 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 understand some of the methods used to encourage people to buy things online. |
| | To know what type of comments and suggestions on a collaborative document can be helpful. | To know what a conditional statement is in programming. | To understand that pattern recognition means identifying patterns to help them work out how the code works. | To know that a weather machine is an automated machine that respond to sensor data. | To understand that technology can be designed to act like or impersonate living things. |
| | To know that you can use images, text, transitions and animation in presentation slides. | To understand that variables can help you to create a quiz on Scratch. | To understand that algorithms can be used for a number of purposes e.g. animation, games design etc. | To understand that weather forecasters use specific language, expression and pre-prepared scripts to help create weather forecast films. | 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. |

| Year 5 | Computing systems and networks | Programming 1 | Data handling | Creating media | Online safety |
|---|---|---|---|---|---|
| | ✦ Search engines | ✦ Music (1/2) | ✦ Mars Rover 1 | Stop motion animation (1/2) | |
| **Key knowledge from the unit** | To know how search engines work. | To know that a soundtrack is music for a film/video and that one way of composing these is on programming software. | To know that Mars Rover is a motor vehicle that collects data from space by taking photos and examining samples of rock. | To know that decomposition of an idea is important when creating stop-motion animations. | To know different ways we can communicate online. |
| | To understand that anyone can create a website and therefore we should take steps to check the validity of websites. | To understand that using loops can make the process of writing music simpler and more effective. | 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 stop motion animation is an animation filmed one frame at a time using models, and with tiny changes between each photograph. | To understand how online information can be used to form judgements. |
| | To know that web crawlers are computer programs that crawl through the internet. | To know how to adapt their music while performing. | To understand that RAM is Random Access Memory and acts as the computer's working memory. | To know that editing is an important feature of making and improving a stop motion animation. | To understand some ways to deal with online bullying. |
| | To understand what copyright is. | | To know what simple operations can be used to calculate bit patterns. | | 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. |

| Year 6 | Computing systems and networks | Programming | Data handling | Creating media | Online safety |
|---|---|---|---|---|---|
| | ✦ Bletchley Park | ✦ Introduction to Python | ✦ Big Data 1 | ✦ History of computers | |
| **Key knowledge from the unit** | To understand the importance of having a secure password and what "brute force hacking" is. | To know that there are text-based programming languages such as Logo and Python. | To know that data contained within barcodes and QR codes can be used by computers. | To know that radio plays are plays where the audience can only hear the action so sound effects are important. | 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 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 that nested loops are loops inside of loops. | To know that infrared waves are a way of transmitting data.<br>. | To know that sound clips can be recorded using sound recording software. | To know what steps are required to capture bullying content as evidence. |
| | To know about some of the historical figures that contributed to technological advances in computing. | To understand the use of random numbers and remix Python code. | To know that Radio Frequency Identification (RFID) is a more private way of transmitting data. | To know that sound clips can be edited and trimmed. | To understand that it is important to manage personal passwords effectively. |
| | To understand what techniques are required to create a presentation using appropriate software. | | To know that data is often encrypted so that even if it is stolen it is not useful to the thief. | | To understand what it means to have a positive online reputation. |
| | | | | | To know some common online scams. |