Marlborough Primary Academy School – Computing Long Term Planning

PSED	CLL	Physical Development	Expressive Arts and Design
Managing Self Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. **Building Relationships** Work and play cooperatively and take turns with others;	**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. **Speaking** Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary; Use new vocabulary	**Fine Motor Skills** Use a range of small tools, including scissors, paint brushes and cutlery	**Creating with Materials** Share their creations, explaining the process they have used;

Year Group	Rationale for Unit of Learning	Key Content from National Curriculum	Skills/Processes	Essential Knowledge	Vocabulary
MAPLE CLASS			•	•	
Maple Class (Y1/Y2) **Autumn 1** **Online Safety 2**	Learning about online safety, including: what happens to information posted online; how to keep things private online; who we should ask before sharing online; describing different ways to ask for, give, or deny permission online.	• Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	• Identifying whether information is safe or unsafe to be shared online. • Learning how to create a strong password. • Learning how to be respectful of others when sharing online and ask for their permission before sharing content. • Learn strategies for checking that 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 uncomfortable.	• To understand the difference between online and off line • To understand what information they should not post online. • To know what the techniques are for creating a strong password. • To know that they should ask permission from others before sharing about them online and that they have the right to say 'no.' • To understand that not everything they read or see online is true.	accept, comment, consent, content, deny, emojis, offline, online, password, permission, personal information, pop ups, pressure, private information, reliable, share, terms and conditions, trusted adult

Maple Class (Y1/Y2)					
Maple Class (Y1/Y2) **Autumn 2** **Computing system and networks – Improving mouse skills (1)**	Knowing how to log in and navigate around a computer, developing mouse skills, learning how to drag, drop, click and control a cursor to create works of art inspired by Kandinsky and self-portraits.	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content. • Recognise common uses of information technology beyond school. • Use technology safely and respectfully, keeping personal information private.	• Learning where keys are located on the keyboard. • Using a basic range of tools within graphic editing software. • Learning how to explore and tinker with hardware to find out how it works. • Logging in and out and saving on their own account • Recognising devices that are connected to the internet. • Developing understanding of different software tools • Developing control of the mouse through dragging, clicking and resizing images to create different effects.	• '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.	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
Maple Class (Y1/Y2) **Spring 1** **Programming 1 – algorithms and debugging (2)**	Developing an understanding of what algorithms are, how to program them and how they can be developed to be more efficient through a range of unplugged and plugged-in activities.	• Understand what algorithms are, how they are implemented as programs on digital devices, and that programs execute by following precise and unambiguous instructions. • Create and debug simple programs • Use logical reasoning to predict the behaviour of simple programs.	• 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.	• 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.	abstraction, algorithm, artificial intelligence, bug, clear, correct, data, debug, decompose, error, key features, loop, predict, unnecessary.

			• Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts.		
Maple Class (Y1 / Y2) **Spring 2** **Creating media – digital imagery (1)**	Using creativity and imagination to plan a miniature adventure story and capturing it using developing photography skills. Children learn to enhance photos using a range of editing tools as well as searching for and adding other images to a project, resulting in a high-quality photo collage showcase.	• Use logical reasoning to predict the behaviour of simple programs • Use technology purposefully to create, organise, store, manipulate and retrieve digital content.	• Learning how to explore and tinker with hardware to find out how it works. • Learning where keys are located on the keyboard. • 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.	• 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.	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
Maple Class (Y1/Y2) **Summer 1** **Programming 2 – Scratch Junior (2)**	Exploring what 'blocks' do, using the app 'ScratchJr,' by carrying out an informative cycle of predict > test > review. Programming a familiar story and an animation of an animal, children make	• Use logical reasoning to predict the behaviour of simple programs • Create and debug simple programs	• Recognising that buttons cause effects and that technology follows instruction • Explaining what an algorithm is. • Following an algorithm.	• To know that coding is writing in a special language so that the compute understands what to do. • To understand that the character in ScratchJr is controlled by the programming blocks	Algorithm, animation, blocks, bug, button CGI, computer code, code, debug, fluid, icon, imitate, instructions, loop, 'On tap', programming, repeat

			• 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.	• To know that you can write a program to create a musical instrument or tell a joke.	ScratchJR, sequence, sound recording
their own musical instrument by creating buttons and recording sounds as well as following an algorithm to record a joke.					
Year Group	**Rationale for Unit of Learning**	**Key Content from National Curriculum**	**Skills/Processes**	**Essential Knowledge (small steps of learning)**	**Vocabulary**
Sycamore Class (Y3/Y4)					
Sycamore Class (Y3/Y4) **Autumn 1** **Online Safety (4)**	Learning how to navigate the internet in an informed, safe and respectful way.	• Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	• 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 negatives of time online. • Identifying respectful and disrespectful online behaviour. • Recognising that information on the Internet might not be true or correct and that	• 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.	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

Sycamore Class (Y3/Y4) **Autumn 2** **Computer systems and networks – collaborative learning (4)**	Working collaboratively in a responsible and considerate way as well as looking at a range of collaborative tools.	• 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. • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information. • Use technology safely, respectfully and responsibly.	• 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.	• 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
Sycamore Class (Y3/4) **Spring 1** **Programming 1 – further coding – scratch (4)**	Learning the basics of programming in Scratch, children will create a simple script, use decomposition and understand what variables are.	• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.	• 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.	• 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.	broadcast block, code blocks, conditional, coordinates, decomposition, features, game, information, negative numbers, orientation, parameters, position, program, project, script, sprite, stage, tinker, variables
Sycamore Class (Y3/Y4) **Spring 2** **Data Handling – investigating weather (4)**	Researching and storing data using spreadsheets, designing a weather station which gathers and records data and learning how weather forecasts are made. Children use tablets or digital cameras to present a weather forecast.	• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.	• 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	• 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.	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

Year Group	Rationale for Unit of Learning	Key Content from National Curriculum	Skills/Processes	Essential Knowledge (small steps of learning)	Vocabulary
			• 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.	information on the internet. • To understand that weather forecasters use specific language, expression and pre-prepared scripts to help create weather forecast films.	solar panel, tablet/digital camera, temperature, thermometer, tornado, warm, weather, weather forecast, wind
Sycamore Class (Y3/Y4) **Summer 1** **Programming 2 – Computational thinking (4)**	Developing the four areas of computational thinking through a range of plugged and unplugged activities.	• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.	• 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. • Creating algorithms for a specific purpose. • Using abstraction and pattern recognition to modify code.	• 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.	abstraction algorithm code computational thinking decomposition input logical reasoning output pattern recognition script sequence variable
Year Group	**Rationale for Unit of Learning**	**Key Content from National Curriculum**	**Skills/Processes**	**Essential Knowledge (small steps of learning)**	**Vocabulary**
Beech Class (Y5/Y6)					
Beech Class (Y5/Y6) **Autumn 1** **Online Safety (5)**	Learning about potential online dangers and 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	• Understand that passwords need to be strong and that apps require some form of passwords.	• Identifying possible dangers online and learning how to stay safe. • Evaluating the pros and cons of online communication.	accurate information advice app permissions application apps bullying

		• Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact •	• 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. • 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.	• 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.	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
Beech Class (Y5/Y6) **Autumn 2** **Computing systems and networks – search engines (5)**	Research skills and finding accurate information	• Use search technologies effectively and be discerning in evaluating digital content. • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	• 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.	• 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.	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

Beech Class (Y5/Y6) **Spring 1** **Programming – Programming music (5)**	Applying programming skills to create sounds and melodies leading to a battle of the bands performance.	• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • 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 •	• 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 (Sonic Pi) to create music. • Identify ways to improve and edit programs, videos, images etc.	• To know that a soundtrack is music for a film/video and that one way of composing these is on programming software. • To understand that using loops can make the process of writing music simpler and more effective. • To know how to adapt their music while performing.	beat buffer bugs coding commands debug decompose error format instructions live loops loop melody mind map music output performance pitch play predict programming rehearsal repetition rhythm sleep sonic pi soundtrack spacing tempo timbre tinker tutorials typing
Beech Class (Y5/Y6) **Summer 1** **Computing systems and networks – Bletchley Park (6)**	Discovering the history of Bletchley Park, historical figures, and computer science. Children learn about code-breaking and password hacking as well as decoding messages. Children present information about historical figures.	• Use search technologies effectively and be discerning in evaluating digital content. • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	• 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.	• 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.	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

			• 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.	• To understand what techniques are required to create a presentation using appropriate software.	pig latin pigpen cipher present scrambled secret secure technological advancement trial and error
Beech Class (Y5/Y6) **Summer 2** **Data Handling – Big Data 1 (6)**	Understanding about the use of big data including barcodes, QR codes, infrared, and RFID technologies. Children will create and scan their own QR codes, manipulate real-time data in spreadsheets, and present their findings. They also analyse transport data to understand its usefulness to commuters.	• 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.	• 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.	• 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. •	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

YEAR B (2024-2025)

Subject - COMPUTING LEARNING SEQUENCE
• EHCP & SEND Support refer to IEPs for the individual children. • Minimum assessment for learning strategies to be used during every lesson: target questioning, peer talk, modelling, mini-plenaries, self-assessment, referral to success criteria. • Long term memory development strategies to be used in every lesson through assessing prior knowledge at beginning of the unit and in the lesson.

PSED	CLL	Physical Development	Expressive Arts and Design
Managing Self Be confident to try new activities and show independence, resilience and perseverance in the face of challenge. **Building Relationships** Work and play cooperatively and take turns with others;	**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. **Speaking** Participate in small group, class and one-to-one discussions, offering their own ideas, using recently introduced vocabulary; Use new vocabulary	**Fine Motor Skills** Use a range of small tools, including scissors, paint brushes and cutlery	**Creating with Materials** Share their creations, explaining the process they have used;

Year Group	Rationale for Unit of Learning	Key Content from National Curriculum	Skills/Processes	Essential Knowledge	Vocabulary
MAPLE CLASS			•	•	
Maple Class (Y1/Y2) **Autumn 1** **Online Safety (1)**	Learning about online safety, including using useful tips to stay safe when online; how to manage feelings and emotions when someone or something has upset us online; learning about the responsibility we have as online users; exploring the idea of a 'digital footprint'.	• recognise common uses of information technology beyond school • use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies. •	• Recognising devices that are connected to the internet. • Understanding that we are connected to others when using the internet • 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.	• 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. •	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

			• 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.		smartwatch strangers tablet trust wired wireless
Maple Class (Y1/Y2) **Spring 1** **Computing systems and networks (1) – What is a computer? (2)**	Exploring what a computer is by identifying and learning how inputs and outputs work. Understanding how computers are used in the wider world, children design their own computerised invention.	• Use logical reasoning to predict the behaviour of simple programs • Recognise common uses of information technology beyond school.	• 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, tables 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.	• 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.	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
Maple Class (Y1/Y2) **Spring 2** **Programming 1 – Algorithms unplugged (1)**	Using an unplugged approach so that algorithms, decomposition and debugging are made relatable to familiar contexts, such as dressing up and making a sandwich, while learning why instructions need to be very specific.	• Understand what algorithms are, how they are implemented as programs on digital devices and that programs execute by following precise and unambiguous instructions. • Create and debug simple programs. • Use logical reasoning to predict the behaviour of simple programs. •	• 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.	• 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.	algorithm automatic bug chunks clear code debug decompose decomposition device directions input instructions manageable motion order

			• 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.	• To know that we call errors in an algorithm 'bugs' and fixing these 'debugging'.	organise output precise programming problem robot sensor sequence solution specific steps tasks virtual assistant
Maple Class (Y1 / Y2) **Summer 1** **Data Handling – International Space Station (2)**	Learning how astronauts survive on the ISS, including identifying necessary items, designing sensor displays, and exploring habitable planets. Children gain an understanding of living in space and how space exploration can benefit life on Earth.	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content.	• 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.	• 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.	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
Maple Class (Y1/Y2) **Summer 2** **Programming 2 – Bee-Bot (1)**	Developing early programming skills using either the Bee:Bot or virtual Bee:Bot.	• Use technology purposefully to create, organise, store, manipulate and retrieve digital content.	• Learning how to explore and tinker with hardware to find out how it works. • Learning how to operate a camera to take photos and videos. • Using decomposition to solve unplugged challenges. • Using logical reasoning to predict the behaviour of simple programs. • Developing the skills associated with	• 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.	algorithm artificial intelligence bee-bot clear code debug demonstration filming inputting instructions pause precise predict program tinker

					video video recording
			• Following a basic set of instructions. • Assembling instructions into a simple algorithm. • 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. • Taking and editing photographs.		

sequencing in unplugged activities.

Year Group	Rationale for Unit of Learning	Key Content from National Curriculum	Skills/Processes	Essential Knowledge (small steps of learning)	Vocabulary
Sycamore Class (Y3/Y4)					
Sycamore Class (Y3/Y4) **Autumn 1** **Online Safety (3)**	Learning about online safety: 'fake news', privacy settings, ways to deal with upsetting online content, protecting our personal information on social media.	• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information. • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	• 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.	• 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.	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

Sycamore Class (Y3/Y4) **Spring 1** **Computing systems and networks 1 – networks and the internet (3)**	Introduction to the concept of networks, learning how devices communicate. From identifying components, learn how information is shared and deepen this understanding by exploring examples of real-world networks	• 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.	• Learning about the purpose of routers. • Understanding the role of the key components of a network. • 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. • Identifying the key components within a network, including whether they are wired or wireless. • Recognising links between networks and the internet. • Learning how data is transferred.	• To understand that a network is a group of interconnected devices. • To know the components that make up a network (Wireless access point/WAP, Network switch, Router, Server and devices). • To know that a server is central to a network and responds to requests made. • To know that the internet connects all the networks around the world. • 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.	device file internet network network switch packet data router server the cloud user WiFi wired wireless wireless access point
Sycamore Class (Y3/4) **Spring 2** **Computing systems and networks 1 – Journey inside a computer (3)**	Assuming the role of computer parts and creating paper versions of computers helps to consolidate an understanding of how a computer works, as well as identifying similarities and differences between various models.	• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. •	• 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	• 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. •	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
Sycamore Class (Y3/Y4) **Summer 1** **Creating media – video trailers (3)**	Developing filming and editing video skills through the storyboarding and creation of book trailers.	• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information. • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.	• 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, sounds and text on screen with transitions.	• 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.	application camera angle clip cross blur cross fade cross zoom desktop digital device dip to black directional wipe edit film film editing software graphics import key events laptop music photo plan recording sound effects storyboard time code trailer transition video voiceover
Sycamore Class (Y3/Y4) **Summer 2** **Programming – Programming Scratch (3)**	Building on the use of the 'ScratchJr' application in Year 2, progressing to using the more advanced computer-based application called 'Scratch', learning to use repetition or 'loops' and building upon skills to program; an animation, a story and a game.	• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.	• 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.	• 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.	algorithm animation application code code block coding application debug decompose interface game loop predict program remixing code repetition code review scratch sprite

Year Group	Rationale for Unit of Learning	Key Content from National Curriculum	Skills/Processes	Essential Knowledge (small steps of learning)	Vocabulary
		• Incorporating loops to make code more efficient. • Continuing existing code. • Making reasonable suggestions for how to debug their own and others' code.			tinker
Beech Class (Y5/Y6)					
Beech Class (Y5/Y6) **Autumn 1** **Online Safety (6)**	Learning how to navigate the internet in an informed, safe and respectful way.	• Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact	• 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.	• 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.	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 authentication url username
Beech Class (Y5/Y6) **Autumn 2**	Identifying some of the types of data that the Mars Rover collects and explaining how the Mars	• Understand computer networks, including the internet; how they can provide multiple services, such as the world-wide web; and the	• Learning that external devices can be programmed by a separate computer.	• To know that Mars Rover is a motor vehicle that collects data from space by taking	8-bit binary addition ascii binary code

Data Handling – Mars Rover `1 (5)	Rover transmits the data back to Earth. Children will read binary numbers, and understand binary addition as well as identifying input, processing and output on the Mars Rovers.	opportunities they offer for communication and collaboration.	• 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 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.	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.	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
Beech Class (Y5/Y6) **Spring 1** **Programming – Introduction to Python (6)**	Learning the fundamentals of the programming language of Python, they will test, change and explain what their program does. Children use loops and explain what repeats do and what the parts of the loop do while recognising that computers choose random numbers and decompose the program into an algorithm.	• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. •	• 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.	• 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.	algorithm code command design import indentation input instructions loop output patterns random remix

			- 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.		repeat shape
Beech Class (Y5/Y6) **Summer 1** **Creating media – History of computers (6)**	Writing, recording and editing radio plays set during WWII, looking back in time at how computers have evolved and designing a computer of the future.	- Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration. - Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. - Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.	- 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.	- 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.	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

Beech Class (Y5/Y6) **Summer 2** **Creating media – Stop motion animation (5)**	Storyboarding ideas, taking photographs and editing to create a video animation.	• design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts • use sequence, selection, and repetition in programs; work with variables and various forms of input and output	• 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.	• To know that decomposition of an idea is important when creating stop-motion animations. • 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 editing is an important feature of making and improving a stop motion animation.	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