St Helen's CE Primary School

Computing Curriculum

Contents

Rationale & Intent

At St Helen's, we are guided by the National Curriculum for Computing (2014). The National Curriculum for computing aims to ensure that all children:

- **Can understand and apply the fundamental principles and concepts of computer science, including abstraction, logic and algorithms and data representation;**
- **Can analyse problems in computational terms and have repeated practical experience of writing computer programs in order to solve such problems;**
- **Can evaluate and apply information technology including new or unfamiliar technologies, analytical to solve problems;**
- **Are responsible, competent, confident and creative users of information and communication technologies.**

Computing is taught as a discrete subject following the Kapow Primary Computing Scheme. Each unit follows a sequence of carefully planned lessons which build on prior knowledge and skills. At St Helen's, we strive to inspire and engage children so that they can take ownership of their learning, providing links to the wider curriculum where appropriate.

The teaching of computing will develop pupils' confidence when encountering new technology, which is a vital skill in the ever-evolving and changing world of technology.

During lessons, children are exposed to high quality teaching and the necessary knowledge and vocabulary to help them learn and develop their work through modelled and guided learning, building up to independent working. They are encouraged to be reflective learners as they build on learning and self-peer assess. Sometimes the learning can be a challenge and we foster a 'can do' attitude, using our mistakes to further our learning.

Through our curriculum, we intend for pupils not only to be digitally competent and have a range of transferable skills at a suitable level for the future workplace, but also to be responsible online citizens. We want to ensure that children are aware of the possible risks when using the internet through a rolling programme of assemblies and specific lessons as well as making sure rules are displayed clearly.

Our vision is that these technologies will enrich the experience of all pupils and that these resources will help to provide an environment that facilitates learning. Our aim is to enable all pupils and staff to be competent and independent users of ICT. We aim to use computing to motivate and inspire pupils and raise standards across the curriculum.

Nursery Learning Journey

Autumn

Introduction to and exploring technology in Continuous Provision

Spring

Using iPads to create snowflakes and other winter pictures & learn how to use the play and pause button using a range of media types.

Summer

Learn how to play, pause and stop a video recording & learn how to take photos

Reception Learning Journey

Autumn

Introduction to and exploring technology in Continuous Provision

Spring 1

Introduction to the internet and Google Earth

Spring 2

Taking photos and recording a video on an iPad

Summer 1

Children will learn about and follow instructions

Summer 2

Children will be introduced to Bee-Bot and learn how to operate one

Year 1 Learning Journey

Autumn 1

Theme: Computer Systems & Networks

Unit: Improving Mouse Skills

Autumn 2

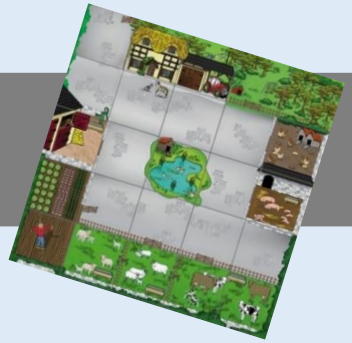
Theme: Programming

Unit: Algorithms Unplugged

Spring 1

Theme: Skills Showcase

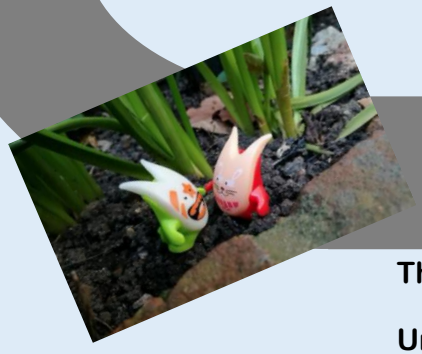
Unit: Rocket to the Moon



Spring 2

Theme: Programming

Unit: Bee-Bot



Summer 1

Theme: Creating Media

Unit: Digital Imagery

Summer 2

Theme: Data Handling

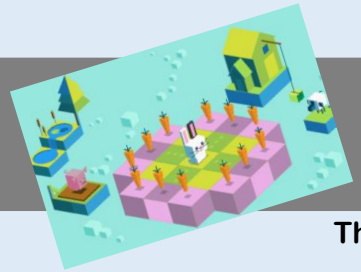
Unit: Introduction to Data

Year 2 Learning Journey

Autumn 1

Theme: Computer Systems & Networks

Unit: What is a Computer?



Autumn 2

Theme: Programming

Unit: Algorithms & Debugging

Spring 2

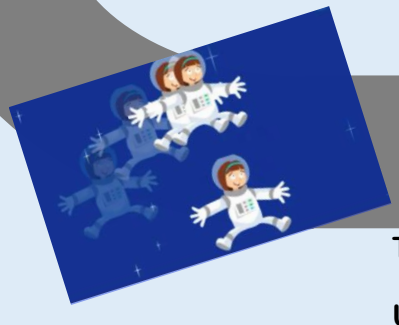
Theme: Programming

Unit: ScratchJr

Spring 1

Theme: Computer Systems & Networks

Unit: Word Processing



Summer 1

Theme: Creating Media

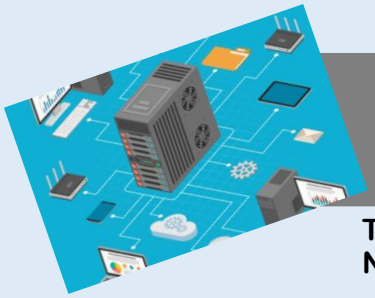
Unit: Stop Motion

Summer 2

Theme: Data Handling

Unit: International Space Station

Year 3 Learning Journey



Autumn 1

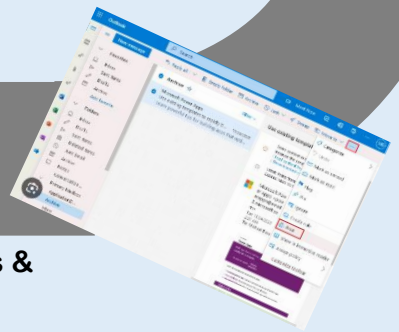
Theme: Computer Systems & Networks

Unit: Networks

Autumn 2

Theme: Programming

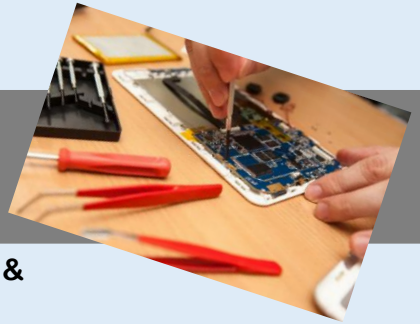
Unit: Scratch



Spring 1

Theme: Computer Systems & Networks

Unit: Emailing



Spring 2

Theme: Computer Systems & Networks

Unit: Journey Inside a Computer

Summer 1

Theme: Creating Media

Unit: Video Trailers

Summer 2

Theme: Data Handling

Unit: Comparison Cards Databases

Year 4 Learning Journey

Autumn 1

Theme: Computer Systems & Networks

Unit: Collaborative Learning

Autumn 2

Theme: Programming

Unit: Further Coding with Scratch

Spring 1

Theme: Creating Media

Unit: Website Design

Spring 2

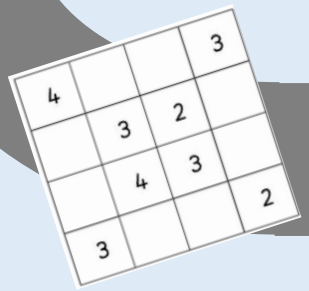
Theme: Skills Showcase

Unit: HTML

Summer 1

Theme: Programming

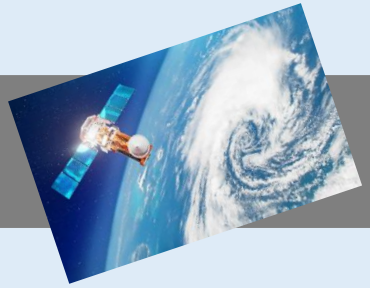
Unit: Computational Thinking



Summer 2

Theme: Data Handling

Unit: Investigating Weather



Year 5 Learning Journey

Autumn 1

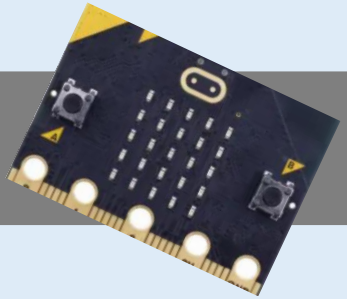
Theme: Computer Systems & Networks

Unit: Search Engines

Autumn 2

Theme: Programming

Unit: Music



Spring 2

Theme: Programming

Unit: Micro:bit

Spring 1

Theme: Data Handling

Unit: Mars Rover 1

Summer 1

Theme: Creating Media

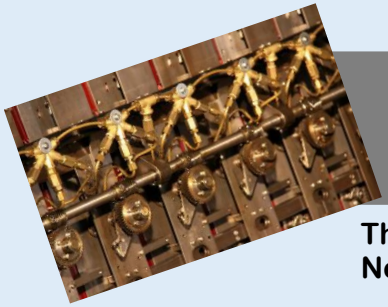
Unit: Stop Motion Animation

Summer 2

Theme: Skills Showcase

Unit: Mars Rover 2

Year 6 Learning Journey



Autumn 1

Theme: Computer Systems & Networks

Unit: Bletchley Park

Autumn 2

Theme: Programming

Unit: Intro to Python

Spring 2

Theme: Creating Media

Unit: History of Computers

Spring 1

Theme: Data Handling

Unit: Big Data 1

Summer 1

Theme: Data Handling

Unit: Big Data 2

Summer 2

Theme: Skills Showcase

Unit: Inventing a Product

Long Term Overview

Nursery						
	Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Overview	During continuous provision, children will be introduced to a variety of different items of technology in the home corner and learn about their purpose. Items such as a washing machine, iron, microwave, kitchen hob and telephone.		Children will use an app on the iPads to create pictures of snowflakes and other winter related objects.	Children will learn how to use the play and pause button to start and pause a range of videos.	Children will be recorded playing instruments as part of their music unit. Children will learn to independently play, pause and stop the videos for themselves.	Children will learn how to take photos as part of their work on other areas of the curriculum.
			Children will continue to be introduced to a variety of different items of technology through continuous provision.			
Vocabulary	Washing Machine Microwave Iron Hob Telephone		iPad Control Touch	Video Press Button Play Pause	Play Stop Pause	Photo Take a photo

Reception						
	Autumn 1	**Autumn 2**	**Spring 1**	**Spring 2**	**Summer 1**	**Summer 2**
Overview	During continuous provision, children will be introduced to a variety of different items of technology, such as different phones, cameras, electronic toys and iPads.		Children will be introduced to the internet and look at Google Maps to find out where they live.	Children will independently take photos of the plants that they are growing. They will begin to learn how to record a video of another child in their class talking about how their plants have grown.	Children will learn that technology works by following instructions. They will follow instructions to do different activities and understand that instructions can be changed when they go wrong (debugging)	Children will be introduced to a Beebot and the language needed to move the Beebot forwards and backwards as well as turn left and right.
Vocabulary	Mobile phone Camera Electronic toy		Internet Google Google Maps	Record Film	Instructions Following Changed	Beebot Forward Backward Left Right

Year 1 Unit 1	
Title	**Computing systems and networks: Improving mouse skills**
Unit Outcomes	By the end of this unit the children will: • Know how to log in and navigate around a computer • Develop mouse skills • Learn how to drag, drop, click and control a cursor • Create works of art inspired by Kandinsky and self-portraits
Key Knowledge	To know: • Logging 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
Key Vocabulary	log in, mouse, keyboard, screen, password, username

Year 1 Unit 2	
Title	**Programming 1: Algorithms unplugged**
Unit Outcomes	By the end of this unit the children will: • Use an unplugged approach so that algorithms, decomposition and debugging are made relatable to familiar contexts, such as dressing up and making a sandwich • Learn why instructions need to be very specific
Key Knowledge	To know: • An algorithm is when instructions are put in an exact order • Errors in an algorithm are called bugs and fixing these is called debugging
Key Vocabulary	algorithm, code, debug, directions, instructions, programming

Year 1 Unit 3	
Title	**Skills showcase: Rocket to the moon**
Unit Outcomes	By the end of this unit the children will: • Develop keyboard and mouse skills through designing, building and testing individual rockets by creating a digital list of materials, using drawing software and recording data
Key Knowledge	To know: • That when we create something on a computer it can be more easily saved and shared than a paper version • That a spreadsheet is an electronic 'table' for sorting data
Key Vocabulary	document, spreadsheet, program, save, sequence

Year 1 Unit 4	
Title	**Programming 2: Bee-Bot**
Unit Outcomes	By the end of this unit the children will: • Develop early programming skills using either the Bee-Bot or virtual Bee-Bot
Key Knowledge	To know: • The basic functions of a Bee-Bot • That you can use a camera/tablet to make simple videos • That algorithms move a Bee-Bot accurately to a chosen destination
Key Vocabulary	algorithm, Bee-Bot, clear, code, input, pause

Year 1 Unit 5	
Title	Creating media: Digital imagery
Unit Outcomes	By the end of the unit the children will: • Use creativity and imagination to plan a miniature adventure story and capture it using developing photography skills • 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
Key Knowledge	To know: • That holding the camera or device still is important to take good pictures • How to search safely for images online
Key Vocabulary	delete, digital camera, download, image

Year 1 Unit 6	
Title	Data handling: Introduction to data
Unit Outcomes	By the end of the unit the children will: • Learn what data is and the different ways that it can be represented • Develop an understanding of why data is useful, how it can be used and ways in which it can be gathered and recorded both by humans and computers
Key Knowledge	To know: • That charts and pictograms can be created using a computer • That computers understand different types of 'input'
Key Vocabulary	data, information, pictogram, bar chart, sort, table, tally

Year 1 Online Safety	
Title	Year 1 Online Safety
Unit Outcomes	By the end of the unit the children will: • Learn about online safety, including using useful tips to stay safe when online • Know how to manage feelings and emotions when someone or something has upset us online • Learn about the responsibility we have as online users • Explore the idea of a 'digital footprint'
Key Knowledge	To know: • That the internet is many devices connected to one another • To tell a trusted adult if you feel unsafe or worried online • That people you do not know on the internet (online) are strangers
Key Vocabulary	device, online, internet, online safety, information

Year 2 Unit 1	
Title	Computing systems and networks 1: What is a computer?
Unit Outcomes	By the end of the unit the children will: • Explore what a computer is by identifying and learning how inputs and outputs work • Understand how computers are used in the wider world • Design their own computerised invention
Key Knowledge	To know: • The difference between a desktop and a laptop computer • Some input devices that give a computer an instruction about what to do • Computers often work together
Key Vocabulary	computer, device, laptop, monitor, technology

Year 2 Unit 2	
Title	**Programming 1: Algorithms and debugging**
Unit Outcomes	By the end of the unit the children will: • Develop an understanding of what algorithms are • Know how to program algorithms • Recognise how algorithms can be developed to be more efficient through a range of unplugged and plugged-in activities
Key Knowledge	To know: • That loops in programming are where you set a certain instruction (or instructions) to be repeated multiple times
Key Vocabulary	clear, loop, predict

Year 2 Unit 3	
Title	**Computing systems and networks 2: Word processing**
Unit Outcomes	By the end of the unit the children will: • Learn about word processing and how to stay safe online • Develop touch typing skills • Learn important keyboard shortcuts, as well as simple editing tools within a word processor including: bold, italics, underline and font colour as well as how to import images
Key Knowledge	To know: • That touch typing is the fastest way to type • That I can make text a different style, size and colour • That 'copy and paste' is a quick way of duplicating text
Key Vocabulary	backspace, bold, copy, delete, highlight, paste, space bar, text

Year 2 Unit 4	
Title	Programming 2: ScratchJr
Unit Outcomes	By the end of this unit the children will: Explore what 'blocks' do, using the app 'ScratchJr,' by carrying out an informative cycle of predict > test > review • Program a familiar story and an animation of an animal • Make their own musical instrument by creating buttons and recording sounds • Follow an algorithm to record a joke
Key Knowledge	To know: • Coding is writing in a special language so that the computer understands what to do • That the character in ScratchJr is controlled by the programming blocks • You can write a program to create a musical instrument or tell a joke
Key Vocabulary	blocks, computer code, sequence

Year 2 Unit 5	
Title	Creating media: Stop motion
Unit Outcomes	By the end of this unit the children will: • Use either tablet devices or devices with cameras to create storyboarding and simple animation
Key Knowledge	To know: • An animation is made up of a sequence of photographs • Small changes in my frames will create a smoother looking animation • Software creates simple animations and some of its features e.g. onion skinning
Key Vocabulary	animation, flipbook, frames, moving images, still images

Year 2 Unit 6	
Title	Data handling: International Space Station
Unit Outcomes	By the end of this unit the children will: • Learn how astronauts survive on the ISS, including identifying necessary items • Design sensor displays, and explore habitable planets • Gain an understanding of living in space and how space exploration can benefit life on Earth
Key Knowledge	To know: • You can enter simple data into a spreadsheet • Computers can be used to monitor supplies
Key Vocabulary	experiment, sensor, temperature

Year 2 Online Safety	
Title	Year 2 Online Safety
Unit Outcomes	By the end of this unit the children will: • Learn about online safety • Know what happens to information posted online • Know how to keep things private online • Know who we should ask before sharing online • Describe different ways to ask for, give, or deny permission online
Key Knowledge	To know: • The difference between online and offline • What information I should not post online • How to create a strong password • That you should ask permission from others before sharing about them online and that they have the right to say ‘no’ • Not everything I see or read online is true
Key Vocabulary	permission, offline, online, personal information, private information, sharing online

Year 3 Unit 1	
Title	Computing systems and networks 1: Networks
Unit Outcomes	By the end of this unit the children will: • Be introduced to the concept of networks • Learn how devices communicate • Learn how information is shared from identifying components • Explore examples of real-world networks
Key Knowledge	To know: • That a network is a group of interconnected devices • That a server is central to a network and responds to requests made • That the internet connects all the networks around the world. • That a router connects us to the internet
Key Vocabulary	network, router, hard drive, memory, storage

Year 3 Unit 2	
Title	Programming: Scratch
Unit Outcomes	By the end of this unit the children will: • Build on the use of the 'ScratchJr' application in Year 2, progressing to using the more advanced application called 'Scratch' • Learn to use repetition or 'loops' • Build upon skills to program an animation, a story and a game
Key Knowledge	To know: • Scratch is a programming language and some of its basic functions • How to use loops to improve programming • That you can remix and adapt existing code
Key Vocabulary	application, code, code block

Year 3 Unit 3	
Title	**Computing systems and networks 2: Emailing**
Unit Outcomes	By the end of this unit the children will: • Learn how to send and edit emails and add attachments • Know how to be a responsible digital citizen by thinking about the contents of what is sent
Key Knowledge	To know: • That email stands for 'electronic mail' • That an attachment is an extra file added to an email • That emails should contain appropriate and respectful content • That cyberbullying is bullying using electronics such as a computer or phone
Key Vocabulary	email (electronic mail), attachment, inbox, send, reply

Year 3 Unit 4	
Title	**Computing systems and networks 3: Journey inside a computer**
Unit Outcomes	By the end of this unit the children will: • Assume the role of computer parts and create paper versions of computers • Consolidate an understanding of how a computer works • Identify similarities and differences between various models
Key Knowledge	To know: • The roles that inputs and outputs play on computers • What some of the different components inside a computer are e.g. CPU, RAM, hard drive, and how they work together • What a tablet is and how it is different from a laptop/desktop computer
Key Vocabulary	assemble, CPU (central processing unit), RAM (random access memory), ROM (read only memory)

Year 3 Unit 5	
Title	**Creating media: Video trailers**
Unit Outcomes	By the end of this unit the children will: • Develop filming and editing video skills through the storyboarding and creation of book trailers
Key Knowledge	To know: • That different types of camera shots can make my photos or videos look more effective • That I can edit photos and videos using film editing software • That I can add transitions and text to my video
Key Vocabulary	digital device, edit, film, editing, graphics, recording, sound effects, transition

Year 3 Unit 6	
Title	**Data handling: Comparison cards databases**
Unit Outcomes	By the end of this unit the children will: • Use the theme of a 'Comparison card game' to understand what a database is • Learn the meanings of records, fields and data • Explore and develop the ideas of sorting and filtering
Key Knowledge	To know: • That a database is a collection of data stored in a logical, structured and orderly manner • That computer databases can be useful for sorting and filtering data • That different visual representations of data can be made on a computer
Key Vocabulary	database, Excel, fields, graph, interpret

Year 3 Online Safety	
Title	**Online Safety**
Unit Outcomes	By the end of this unit the children will: • Learn about online safety • Recognise 'fake news' • Understand privacy settings • Explain ways to deal with upsetting online content • Understand how to protect personal information on social media
Key Knowledge	To know: • That not everything on the internet is true: people share facts, beliefs and opinions online • The internet can affect people's moods and feelings • Privacy settings limit who can access important personal information, such as names, ages, gender etc • What social media is and that age restrictions apply
Key Vocabulary	age restrictions, fact, fake news, opinion, privacy settings, search engine

Year 4 Unit 1	
Title	**Computing systems and networks: Collaborative learning**
Unit Outcomes	By the end of this unit the children will: • Work collaboratively in a responsible and considerate way • Explore a range of collaborative tools
Key Knowledge	To know: • That software can be used collaboratively online to work as a team • That you can use images, text, transitions and animation in presentation slides
Key Vocabulary	collaboration, email account, format, software, teamwork

Year 4 Unit 2	
Title	**Programming 1: Further coding with Scratch**
Unit Outcomes	By the end of this unit the children will: • Learn the basics of programming in Scratch • Create a simple script • Use decomposition • Understand what variables are
Key Knowledge	To know: • That a variable is a value that can change (depending on conditions) and know that you can create them in Scratch • What a conditional statement is in programming • That using variables can help you to create a quiz on Scratch
Key Vocabulary	conditional statement, coordinates, position, script, variable

Year 4 Unit 3	
Title	**Creating media: Website design**
Unit Outcomes	By the end of this unit the children will: • Develop their research, word processing, and collaborative working skills • Learn how web pages and web sites are created • Explore how to change layouts, embed images and videos and link between pages
Key Knowledge	To know: • That a website is a collection of pages that are all connected • That websites usually have a homepage and subpages as well as clickable links to new pages, called hyperlinks • That websites should be informative and interactive
Key Vocabulary	content, homepage, hyperlinks, web page, website

Year 4 Unit 4	
Title	**Skills showcase: HTML**
Unit Outcomes	By the end of this unit the children will: • Edit the HTML and CSS of a web page to change the layout of a website and the text and images
Key Knowledge	To know: • How to identify examples of HTML tags • What changing the HTML does to alter the appearance of an object on the web • That copyright means that those images are protected
Key Vocabulary	copyright, hacking, HTML, internet browser

Year 4 Unit 5	
Title	**Programming 2: Computational thinking**
Unit Outcomes	By the end of this unit the children will: • develop the four areas of computational thinking through a range of plugged and unplugged activities
Key Knowledge	To know: • That combining computational thinking skills can help you to solve a problem • That pattern recognition means identifying patterns to help them work out how the code works • That algorithms can be used for a number of purposes e.g. animation, games design etc
Key Vocabulary	computational thinking skills, logical reasoning, pattern recognition

Year 4 Unit 6	
Title	**Data handling: Investigating weather**
Unit Outcomes	By the end of this unit the children will: • Research and store data using spreadsheets • Design a weather station which gathers and records data • Learn how weather forecasts are made • Use tablets or digital cameras to present a weather forecast
Key Knowledge	To know: • That computers can use different forms of input to sense the world around them so that they can record and respond to data ('sensor data') • That a weather machine is an automated machine that respond to sensor data • That weather forecasters use specific language, expression and pre-prepared scripts to help create weather forecast films
Key Vocabulary	accurate, measurement, sensor data, solar panel

Year 4 Online Safety	
Title	**Year 4 Online Safety**
Unit Outcomes	By the end of this unit the children will: • Learn how to navigate the internet in an informed, safe and respectful way •
Key Knowledge	To know: • Some of the methods used to encourage people to buy things online • Technology can be designed to act like or impersonate living things • Technology can be a distraction and identify when someone might need to limit the amount of time spent using technology • What behaviours are appropriate to stay safe and be respectful online
Key Vocabulary	advertisement, bot, fact, hashtag, implications, reliable, risk, search results, trustworthy

Year 5 Unit 1	
Title	**Computing systems and networks: Search engines**
Unit Outcomes	By the end of the unit the children will: • Develop research skills to find accurate information
Key Knowledge	To know: • How search engines work • That anyone can create a website and therefore we should take steps to check the validity of websites • That web crawlers are computer programs that crawl through the internet • What copyright is
Key Vocabulary	copyright, deceive, inappropriate, keywords, search engine

Year 5 Unit 2	
Title	**Programming 1: Music**
Unit Outcomes	By the end of this unit the children will • Apply programming skills to create sounds and melodies leading to a 'battle of the bands' performance
Key Knowledge	To know • That a soundtrack is music for a film/video and that one way of composing these is on programming software. • That using loops can make the process of writing music simpler and more effective. • How to adapt their music while performing.
Key Vocabulary	beat, format, live loops, melody, pitch, repetition, rhythm, tempo, timbre

Year 5 Unit 3	
Title	**Data handling: Mars Rover 1**
Unit Outcomes	By the end of this unit the children will: • Identify some of the types of data that the Mars Rover collects and explain how the Mars Rover transmits the data back to Earth • Read binary numbers, and understand binary addition as well as identifying input, processing and output on the Mars Rovers
Key Knowledge	To know: • Mars Rover is a motor vehicle that collects data from space by taking photos and examining rock samples • What numbers using binary code look like and be able to identify how messages can be sent in this format • RAM is Random Access Memory and acts as the computer's working memory • What simple operations can be used to calculate bit patterns
Key Vocabulary	binary code, byte, data transmission, numerical data

Year 5 Unit 4	
Title	**Programming 2: Micro:bit**
Unit Outcomes	By the end of this unit the children will: • Clip blocks together in a program • Predict what will happen while making connections with previously used programming interfaces • Create animations • Recognise inputs/outputs • Choose appropriate blocks • Break programs down into smaller steps
Key Knowledge	To know: • That a Micro:bit is a programmable device • That Micro:bit uses a block coding language similar to Scratch • How to recognise coding structures including variables • What techniques to use to create a program for a specific purpose (including decomposition)
Key Vocabulary	blocks, code block, connection, Micro:bit

Year 5 Unit 5	
Title	**Creating media: Stop motion animation**
Unit Outcomes	By the end of the unit the children will: • Use storyboarding ideas, taking photographs and editing to create a video animation
Key Knowledge	To know: • How to decompose animations into a series of images • How to decomposing a story to be able to plan a program to tell a story • How to video editing software to animate
Key Vocabulary	animator, fluid movement, frames, stop motion

Year 5 Unit 6	
Title	**Skills showcase: Mars Rover 2**
Unit Outcomes	By the end of this unit the children will: • Learn about pixels and binary • Create a pixel picture • Save a JPEG as a bitmap to understand the transfer of image data • Learn about the 'fetch, decode, execute' cycle and its real-world applications • Begin to use 3D design tools
Key Knowledge	To know: • That bit patterns represent images as pixels • That the data for digital images can be compressed • The difference between ROM and RAM
Key Vocabulary	binary image, drag and drop, execute, JPEG, memory, pixels

Year 5 Online Safety	
Title	Year 5 Online Safety
Unit Outcomes	By the end of this unit the children will: • Learn about potential online dangers and safety
Key Knowledge	To know: • Possible dangers online and how to stay safe • The pros and cons of online communication • That information on the internet might not be true or correct and ways of checking validity • What to do if they experience bullying online • How to use an online community safely
Key Vocabulary	app permissions, communication, judgement, meme, mental health, mindfulness

Year 6 Unit 1	
Title	**Computing systems and networks: Bletchley Park**
Unit Outcomes	By the end of this unit the children will: • Discover the history of Bletchley Park, historical figures, and computer science • Learn about code-breaking and password hacking as well • Decode messages • Present information about historical figures
Key Knowledge	To know: • The importance of having a secure password and what “brute force hacking” is • That the first computers were created at Bletchley Park to crack the Enigma code to help the war effort in World War 2 • About some of the historical figures that contributed to technological advances in computing • What techniques are required to create a presentation using appropriate software
Key Vocabulary	copyright, data leak, web crawler

Year 6 Unit 2	
Title	**Programming: Intro to Python**
Unit Outcomes	By the end of this unit the children will: • Learn the fundamentals of the programming language of Python • Test, change and explain what their program does • Use loops and explain what repeats do and what the parts of the loop do • Recognise that computers choose random numbers • Decompose the program into an algorithm
Key Knowledge	To know: • That there are text-based programming languages such as Logo and Python • That nested loops are loops inside of loops • The use of random numbers and remix Python code
Key Vocabulary	commands, decompose, error, format, live loops

Year 6 Unit 3	
Title	**Data handling 1: Big Data 1**
Unit Outcomes	By the end of this unit the children will: • Understand about the use of big data including barcodes, QR codes, infrared, and RFID technologies • Create and scan their own QR codes • Manipulate real-time data in spreadsheets, and present their findings • Analyse transport data to understand its usefulness to commuters
Key Knowledge	To know: • Data contained within barcodes and QR codes can be used by computers • Infrared waves are a way of transmitting data • Radio Frequency Identification (RFID) is a more private way of transmitting data • Data is often encrypted so that even if it is stolen it is not useful to the thief
Key Vocabulary	Boolean, encrypt, infrared, proximity, radio waves, RFID

Year 6 Unit 4	
Title	**Creating media: History of computers**
Unit Outcomes	By the end of this unit the children will: • Write, record and edit radio plays set during WWII • Look back in time at how computers have evolved • Design a computer of the future
Key Knowledge	To know: • That radio plays are plays where the audience can only hear the action so sound effects are important • That sound clips can be recorded using sound recording software • That sound clips can be edited and trimmed
Key Vocabulary	gigabyte, graphics, kilobytes, megabyte, memory storage, operating system

Year 6 Unit 5	
Title	**Data handling 2: Big Data 2**
Unit Outcomes	By the end of this unit the children will: • Understand data usage through the use of mobile data vs WiFi, the Internet of Things, and big data • Identify high/low data activities • Prepare presentations on using Big Data/IoT to improve school efficiency while respecting privacy
Key Knowledge	To know • That data can become corrupted within a network but this is less likely to happen if it is sent in 'packets' • That devices or that are not updated are most vulnerable to hackers • The difference between mobile data and WiFi
Key Vocabulary	energy, GPS, mobile data, WiFi, wireless

Year 6 Unit 6	
Title	**Skills showcase: Inventing a product**
Unit Outcomes	By the end of this unit the children will: • Design a new electronic product using CAD software to design appropriate housing for it • Developing skills in website design, video editing, and persuasive language to promote their product • Evaluate and adapt existing code, debugging programs, and searching for accurate information online
Key Knowledge	To know: • What designing an electronic product involves • Which programming software/language is best to achieve a purpose • The building blocks of computational thinking e.g. sequence, selection, repetition, variables and inputs and outputs
Key Vocabulary	evaluate, influence, manipulation

Year 6 Online Safety	
Title	**Online Safety**
Unit Outcomes	By the end of this unit the children will: • Learning how to navigate the internet in an informed, safe and respectful way
Key Knowledge	To know: • A digital footprint means the information that exists on the internet as a result of a person's online activity. • What steps are required to capture bullying content as evidence. • It is important to manage personal passwords effectively. • What it means to have a positive online reputation. • Some common online scams.
Key Vocabulary	anonymity, antivirus, digital footprint, digital personality, hacking, malware

Progression Overview

Computer Systems & Networks	
Year Group	**Knowledge & Skills**
Nursery	• Recognise a variety of different items of technology and understand their purpose.
Nursery	• Children will learn how to use the play and pause button to start and pause a range of videos. This will be through the use of iPads and the interactive white board.
Reception	• Recognise a variety of different items of technology and understand their purpose.
Reception	• Be aware of the internet • Explore Google Earth as a class
1	• Logging 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
2	• The difference between a desktop and a laptop computer • Some input devices that give a computer an instruction about what to do • Computers often work together • That touch typing is the fastest way to type • That I can make text a different style, size and colour • That 'copy and paste' is a quick way of duplicating text
3	• That a network is a group of interconnected devices • That a server is central to a network and responds to requests made • That the internet connects all the networks around the world. • That a router connects us to the internet • That email stands for 'electronic mail' • That an attachment is an extra file added to an email • That emails should contain appropriate and respectful content • That cyberbullying is bullying using electronics such as a computer or phone

	• The roles that inputs and outputs play on computers • What some of the different components inside a computer are e.g. CPU, RAM, hard drive, and how they work together • What a tablet is and how it is different from a laptop/desktop computer
4	• That software can be used collaboratively online to work as a team • That you can use images, text, transitions and animation in presentation slides
5	• How search engines work • That anyone can create a website and therefore we should take steps to check the validity of websites • That web crawlers are computer programs that crawl through the internet • What copyright is
6	• The importance of having a secure password and what "brute force hacking" is • That the first computers were created at Bletchley Park to crack the Enigma code to help the war effort in World War 2 • About some of the historical figures that contributed to technological advances in computing • What techniques are required to create a presentation using appropriate software •

Programming	
Year Group	**Knowledge & Skills**
Reception	• Be able to move the Beebot forwards and backwards as well as turn left and right.
1	• An algorithm is when instructions are put in an exact order • Errors in an algorithm are called bugs and fixing these is called debugging • The basic functions of a Bee-Bot • That you can use a camera/tablet to make simple videos • That algorithms move a Bee-Bot accurately to a chosen destination
2	• That loops in programming are where you set a certain instruction (or instructions) to be repeated multiple times • Coding is writing in a special language so that the computer understands what to do • That the character in ScratchJr is controlled by the programming blocks • You can write a program to create a musical instrument or tell a joke

3	• Scratch is a programming language and some of its basic functions • How to use loops to improve programming • That you can remix and adapt existing code •
4	• That a variable is a value that can change (depending on conditions) and know that you can create them in Scratch • What a conditional statement is in programming • That using variables can help you to create a quiz on Scratch • That combining computational thinking skills can help you to solve a problem • That pattern recognition means identifying patterns to help them work out how the code works • That algorithms can be used for a number of purposes e.g. animation, games design etc
5	• That a soundtrack is music for a film/video and that one way of composing these is on programming software. • That using loops can make the process of writing music simpler and more effective. • How to adapt their music while performing. • That a Micro:bit is a programmable device • That Micro:bit uses a block coding language similar to Scratch • How to recognise coding structures including variables • What techniques to use to create a program for a specific purpose (including decomposition)
6	• That there are text-based programming languages such as Logo and Python • That nested loops are loops inside of loops • The use of random numbers and remix Python code

Creating Media	
Year Group	**Knowledge & Skills**
Nursery	• Create digitally drawn pictures based around a theme.
Nursery	• Independently play, pause and stop a pre-recorded video.
Nursery	• Independently take a photo.
Reception	• Independently take multiple photos. • Begin to learn how to record a video of another child in my class.
1	• That holding the camera or device still is important to take good pictures • How to search safely for images online
2	• An animation is made up of a sequence of photographs • Small changes in my frames will create a smoother looking animation • Software creates simple animations and some of its features e.g. onion skinning
3	• That different types of camera shots can make my photos or videos look more effective • That I can edit photos and videos using film editing software • That I can add transitions and text to my video
4	• That a website is a collection of pages that are all connected • That websites usually have a homepage and subpages as well as clickable links to new pages, called hyperlinks • That websites should be informative and interactive
5	• How to decompose animations into a series of images • How to decomposing a story to be able to plan a program to tell a story • How to video editing software to animate
6	• That radio plays are plays where the audience can only hear the action so sound effects are important • That sound clips can be recorded using sound recording software • That sound clips can be edited and trimmed

Data Handling	
Year Group	**Knowledge & Skills**
1	• That charts and pictograms can be created using a computer • That computers understand different types of 'input'
2	• You can enter simple data into a spreadsheet • Computers can be used to monitor supplies
3	• That a database is a collection of data stored in a logical, structured and orderly manner • That computer databases can be useful for sorting and filtering data • That different visual representations of data can be made on a computer
4	• 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') • That a weather machine is an automated machine that respond to sensor data • That weather forecasters use specific language, expression and pre-prepared scripts to help create weather forecast films
5	• Mars Rover is a motor vehicle that collects data from space by taking photos and examining rock samples • What numbers using binary code look like and be able to identify how messages can be sent in this format • RAM is Random Access Memory and acts as the computer's working memory • What simple operations can be used to calculate bit patterns
6	• Data contained within barcodes and QR codes can be used by computers • Infrared waves are a way of transmitting data • Radio Frequency Identification (RFID) is a more private way of transmitting data • Data is often encrypted so that even if it is stolen it is not useful to the thief • That data can become corrupted within a network but this is less likely to happen if it is sent in 'packets' • That devices or that are not updated are most vulnerable to hackers • The difference between mobile data and WiFi

Online Safety	
Year Group	**Knowledge & Skills**
1	• That the internet is many devices connected to one another • To tell a trusted adult if you feel unsafe or worried online • That people you do not know on the internet (online) are strangers
2	• The difference between online and offline • What information I should not post online • How to create a strong password • That you should ask permission from others before sharing about them online and that they have the right to say 'no' • Not everything I see or read online is true
3	• That not everything on the internet is true: people share facts, beliefs and opinions online • The internet can affect people's moods and feelings • Privacy settings limit who can access important personal information, such as names, ages, gender etc • What social media is and that age restrictions apply
4	• Some of the methods used to encourage people to buy things online • Technology can be designed to act like or impersonate living things • Technology can be a distraction and identify when someone might need to limit the amount of time spent using technology • What behaviours are appropriate to stay safe and be respectful online
5	• Possible dangers online and how to stay safe • The pros and cons of online communication • That information on the internet might not be true or correct and ways of checking validity • What to do if they experience bullying online • How to use an online community safely
6	• A digital footprint means the information that exists on the internet as a result of a person's online activity. • What steps are required to capture bullying content as evidence. • It is important to manage personal passwords effectively. • What it means to have a positive online reputation. • Some common online scams.