Wylye Valley
Primary School

Love Care Respect

To aspire to being outstanding in everything we do, by always aiming higher.

"Let your light shine in all you say and do."

Matthew 5:16

Computing Progression at Wylye Valley C.E. Primary School – 2022/23

Key computing questions:

Can you understand the basic concepts of computer science?
Can you solve problems in computer programs?
Can you evaluate information technology to help you solve problems?
Are you a responsible and confident user of technology?

At Wylye Valley, children are taught about internet safety and basic ICT skills in the first term of each academic year. They are then taught the other parts of the curriculum throughout the year. We use Kapow to support our teaching of the curriculum.

Year Group	Sequence of learning	Unit outcomes	Key skills and knowledge	*Vocabulary*
Reception	**Computing systems and Networks:** **Using a computer** 1. To learn what a keyboard is and how to locate relevant keys 2. To learn how to log in and log out 3. To learn what a mouse is and to develop basic mouse skills such as moving and clicking	Introduce the basic parts of a computer and practicing using them.	First exposure to using equipment that will be used throughout their school life.	**Computer Monitor** **Computer tower** **Keyboard Mouse** **Letters Numbers** **Uppercase Lowercase** **Type Log in Log out** **Computer safety** **Password Private** **Secure Security** **Left-click Right-click** **Arrow Cursor** **Drag Move Drop**
	Programming 1: **All about Instructions** 1. To follow instructions as part of practical activities and games 2. To learn to give simple instructions 3. To learn that an algorithm is a set of instructions to carry out a task, in a specific order 4. To learn how to explore and tinker with hardware to develop familiarity and introduce relevant vocabulary	The children learn to receive and give instructions and understand the importance of precise instructions.	Introduces that when a computer does something it is following instructions called code.	**Instructions** **Turn** **Left Right** **Timer** **Describe Adjective** **Two-part instructions** **Algorithm**
	Programming 2: **Exploring hardware** 1. To learn how to explore and tinker with hardware to develop familiarity and introduce relevant vocabulary 2. To recognise that a range of technology is used in places such as homes and schools 3. To learn how to operate a camera and/or iPad and use it to take photographs	Tinkering and exploring with different computer hardware and learning to operate a camera.	Introduces understanding that computers and technology are all around us. Introduces taking photographs using technology.	**Mouse Buttons** **Keyboard Keys** **USB stick System fan** **Hard drive Monitor** **Computer tower Speaker** **Open Shut** **Computer Memory** **Power Batteries** **Camera iPad** **Tablet Lens** **Point Shoot** **Capture Picture** **Image Record** **Photograph**
	Data Handling: **Introduction to data** 1. To understand how to sort and categorise objects 2. To explain how items have been sorted and categorised 3. To explore and understand the concept of branch databases 4. To understand how to represent data in a pictogram 5. To understand how to read a simple pictogram	Children sort and categorise data and are introduced to branching databases and pictograms.	Introduces the idea of branching databases and how they are used.	**Sort Category** **Group Texture** **Colour Pattern** **Size Weight** **Height Length** **Sort Branch database** **Pictogram Graph** **Column Row** **Square Data** **Collect Record** **Count**

Year Group	Sequence of learning	Unit outcomes	Key skills and knowledge	*Vocabulary*
Year 1/2 **A**	**Online Safety** 1. To know what the internet is and how to use it safely 2. To understand different feelings when using the internet 3. To understand how to treat others, both online and in-person 4. To understand the importance of being careful about what we post and share online	Children will be able to: - Discuss what the internet is and how it can be used. - Recognise that the internet may affect mood or emotions. - Recognise how internet use can affect and upset other. - Identify which information is appropriate to share and post online and which is not.	- 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. - 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. - 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 Online** **Personal information** **Phone Posting** **Sharing Smartphone** **Smart TV Smartwatch** **Tablet Wireless**
	Computing systems and Networks: **Improving mouse skills** 1. To log into a computer and access a website 2. To develop mouse skills 3. To use mouse skills to draw and edit shapes 4. To draw a scene from a story using digital tools 5. To create a self-portrait using digital techniques	Children will be able to: - Use computers more purposefully. - Log in and navigate around a computer. - Drag, drop, click and control a cursor using a mouse. - Use software tools to create art on the computer.	- Learning how to explore and tinker with hardware to find out how it works. - Learning where keys are located on the keyboard. - Using a basic range of tools within graphic editing software. - Developing control of the mouse through dragging, clicking and resizing of images to create different effects. - Developing understanding of different software tools. - Recognising devices that are connected to the internet. - Logging in and out and saving work on their own account. - To know that "log in" and "log out" means to begin and end a connection with a computer - To know that a computer and mouse can be used to click, drag, fill and select and also add backgrounds, text, layers, shapes and clip art. - To know that passwords are important for security.	**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**

	Programming 1: **Algorithms unplugged** 1. To understand what an algorithm is 2. To follow instructions precisely to carry out an action 3. To understand that computers and devices around us use inputs and outputs 4. To understand and be able to explain what decomposition is 5. To know how to debug an algorithm	Children will be able to: - Explain what an algorithm is. - Write clear algorithms. - Follow an algorithm. - Explain what inputs and outputs are. - Create an achievable program. - Decompose a design into steps. - Identify bugs in an algorithm and how to fix them.	- 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. - 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 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. - To know that we call errors in an algorithm 'bugs' and fixing these 'debugging'.	**Algorithm Automatic** **Bug Chunks** **Clear Code** **Debug Decompose** **Decomposition** **Device Directions** **Input Instructions** **Manageable Motion** **Order Organise** **Output Precise** **Programming** **Problem Robot** **Sensor Sequence** **Solution Specific** **Steps Tasks**
	Creating media: **Digital imagery** 1. To understand and create a sequence of pictures 2. To take clear photos 3. To edit photos 4. To search for and import images 5. To create a photo collage	Children will be able to: - Plan a pictorial story using photographic images in sequence. - Explain how to take clear photos. - Take photos using a device. - Edit photos by cropping, filtering and resizing. - Search for and import images from the internet. - Explain what to do if something makes them uncomfortable online. - Organise images on the page, orientating where necessary.	- 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**

	Programming 2: **Bee-Bot** 1. To explore a new device 2. To create a demonstration video 3. To plan and follow a set of instructions precisely 4. To program a device 5. To create a program	Children will be able to: - Recognise cause and effect when pressing buttons on a Bee-Bot. - Discuss and demonstrate how the Bee-Bot works. - Record video ensuring everyone is in the shot. - Give a number of clear instructions in sequence. - Program a Bee-Bot to reach a destination. - Identify and correct mistakes in their programming.	- 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 sequencing in unplugged activities. - 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. - To understand the basic functions of a Bee-Bot. - To know that you can use a camera 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**

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Year 1/2 **B**	**Online Safety** 1. To know what happens to information posted online 2. To know how to keep things safe and private online 3. To explain what should be done before sharing information online 4. To explain why I have the right to say no and deny permission 5. To understand strategies that will help me decide if something seen online is true or not	Children will be able to: - Explain what is meant by online information. - Recognise what information is safe to be shared online. - Explain why we need passwords and what makes a strong password. - Understand that they need to ask permission before sharing content online and explain why. - Understand that they have the right to deny their permission to information about them being shared online. - Say who they can ask for help with online worries. - Use some strategies to work out if online information is reliable or not.	- Identifying whether information is safe or unsafe to be shared online. - Learning how to create a strong password. - Learning to be respectful of others when sharing online and ask for their permission before sharing content. - Learning strategies for checking if something they read online is true. - Understanding how to stay safe when talking to people online and what to do if they see or hear something online that makes them feel upset or uncomfortable. - To understand the difference between online and offline. - To understand what information I should not post online. - To know what the techniques are for creating a strong password. - To know that you should ask permission from others before sharing about them online and that they have the right to say 'no.' - To understand that not everything I see or read online is true.	**Accept Comment** **Consent Content** **Deny Emojis** **Offline Online** **Password Permission** **Personal information** **Pop ups Pressure** **Private information** **Reliable Share** **Terms and conditions** **Trusted adult**
	Computing systems and Networks: **What is a computer?** 1. To recognise the parts of a computer 2. To recognise how technology is controlled 3. To recognise technology 4. To create a design for an invention 5. To understand the role of computers	Children will be able to: - Name some computer peripherals and their function. - Recognise that buttons cause effects. - Explain that technology follows instructions. - Recognise different forms of technology. - Design an invention which includes inputs and outputs. - Explain the role of computers in the world around them.	- Understanding what a computer is and that it's made up of different components. - Recognising that buttons cause effects and that technology follows instructions. - Learning how we know that technology is doing what we want it to do via its output. - Using greater control when taking photos with cameras, tablets or computers. - Developing 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**

	Programming 1: **Algorithms and debugging** 1. To decompose a game to predict the algorithms that are used 2. To understand that computers can use algorithms to make predictions (machine learning) 3. To plan algorithms that will solve problems 4. To understand what abstraction is 5. To understand what debugging is	Children will be able to: - Decompose a game to predict the algorithms. - Give a definition for 'decomposition'. - Write clear and precise algorithms. - Create algorithms to solve problems. - Use loops in their algorithms to make their code more efficient. - Explain what abstraction is.	- 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. - Developing word processing skills, including altering text, copying and pasting and using keyboard shortcuts. - 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**
	Data handling: **International Space Station** 1. To understand how computers can help humans survive in space 2. To create a digital drawing of essential items for life in space 3. To understand the role of sensors on the ISS 4. To create an algorithm for growing a plant in space 5. To interpret data	Children will be able to: - Describe and explain how astronauts' survival needs are met aboard the ISS. - Identify and digitally draw items which fulfil basic human needs when aboard the ISS. - Read the correct temperature on a thermometer. - Design a display showing everything that needs to be monitored by sensors on the ISS. - Create an algorithm that addresses all plants' needs. - Explain how space exploration can benefit life on Earth. - Read data to identify whether a planet might be habitable.	- 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**

	Programming 2: **Scratch Jr** 1. To explore a new application 2. To create an animation 3. To use characters as buttons 4. To follow an algorithm 5. To plan and use code to create an algorithm	Children will be able to: - Explore a new application independently. - Explain what the blocks on Scratch Jr do and use them for a purpose. - Recognise a loop in coding and why it is useful. - Use a code to create an animation of an animal moving. - Use code to follow and create an algorithm. - Program code to run 'on tap'. - Explain the role of the blocks in a program they have created.	- Recognising that buttons cause effects and that technology follows instructions. - 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. - Using loop blocks when programming to repeat an instruction more than once. - Using software (and unplugged means) to create story animations. - To know that coding is writing in a special language so that the computer understands what to do. - To understand that the character in Scratch Jr is controlled by the programming blocks. - To know that you can write a program to create a musical instrument or tell a joke.	**Algorithm Animation** **Blocks Bug** **Button CGI** **Computer code** **Code Debug** **Fluid Icon** **Imitate Instructions** **Loop 'On tap'** **Programming** **Repeat Scratch JR** **Sequence** **Sound recording**

Year Group	Sequence of learning	Unit outcomes	Key skills and knowledge	*Vocabulary*
Year 3	**Online Safety** 1. To understand how the internet can be used to share beliefs, opinions and facts 2. To understand the effects that some internet use can have on our feelings and emotional wellbeing 3. To understand the ways personal information can be shared on the internet 4. To understand the rules for social media platforms	Children will be able to: - Differentiate between fact, opinion and belief online. - Explain how to deal with upsetting online content. - Recognise that digital devices communicate with each other to share personal information. - Explain what social media platforms are used for. - Recognise why social media platforms are age-restricted.	- 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**
	Computing systems and networks 1: Networks and the internet (Microsoft Office 365) 1. To understand what a network is and understand our school network 2. To understand how information moves around a network and begin to recognise real world networks 3. To understand how the Internet works and explain a website's journey 4. To explore the role of routers 5. To understand the role of packets	Children will be able to: - Recognise that a network is two or more devices connected. - Explain how information moves around a network and the role of the server. - Understand that networks connect to the internet via a router. - Explain some of the journey a website goes through to reach your computer. - Explain that websites are split into small pieces (packets) to be sent via the internet.	- Learning about the purpose of routers. - Understanding the role of the key components of a network. - Understanding that websites & 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 what a network is and how a school network might be organised. - To know that a server is central to a network and responds to requests made. - To know that a router connects us to the internet. - To know how the internet uses networks to share files. - To know what a packet is and why it is important for website data transfer.	**Cables Component** **Connection Corrupted** **Data Desktop** **Device DSL** **Fibre File** **Internet Laptop** **Network Network map** **Network switch** **Packets Radio waves** **Router Server** **Submarine cables** **Tablet Text map** **The Cloud Web server** **Website** **Website trackers** **WiFi Wired**

	Computing systems and networks 2: **Journey inside a computer** 1. To recognise basic inputs and outputs 2. To decompose a laptop 3. To understand the purpose of computer parts 4. To understand the purpose of computer parts 5. To decompose a tablet computer	Children will be able to: - Recognise inputs and outputs and that the computer sends and receives information. - Explain that the parts of a laptop work together and the purpose of each part. - Explain what an algorithm is. Suggest what memory is for inside a computer. - Make comparisons between different types of computer.	- 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**
	Creating media: **Video trailers using iPads** 1. To plan a book trailer 2. To take photos or videos to tell a story 3. To edit a video 4. To add text and transitions to a video 5. To evaluate video editing	Children will be able to: - Describe the purpose of a trailer. Create a storyboard for a book trailer. - Consider camera angles when taking photos or videos. - Import videos and photos into film editing software. - Record sounds and add these to a video. - Add text to a video. - Incorporate transitions between images. - Evaluate their own and others' trailers.	- 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**
	Programming: **Scratch** 1. To explore a programming application 2. To use repetition (a loop) in a program 3. To program an animation 4. To program a story 5. To program a game	Children will be able to: - Explain what some of the blocks do in Scratch. - Explain what a loop is and include one in their program. - Suggest possible additions to an existing program. - Recognise where something on screen is controlled by code. - Use a systematic approach to find bugs. - Explain what an algorithm is and its purpose.	- 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. - Incorporating loops to make code more efficient. - Continuing existing code. - Making reasonable suggestions for how to debug their own and others' code. - To know that Scratch is a programming language and some of its basic functions. - To understand how to use loops to improve programming. - To understand how decomposition is used in programming. - To understand that you can remix and adapt existing code.	**Algorithm Animation** **Application Code** **Code block** **Coding application** **Debug Decompose** **Interface Game** **Loop Predict** **Program Remixing code** **Repetition code** **Review Scratch** **Sprite Tinker**

Year Group	Sequence of learning	Unit outcomes	Key skills and knowledge	*Vocabulary*
Year 4	**Online Safety** 1. To describe how to search for information within a wide group of technologies and make a judgement about the probable accuracy 2. To describe some of the methods used to encourage people to buy things online 3. To explain why lots of people sharing the same opinions or beliefs online do not make those opinions or beliefs true 4. To explain that technology can be designed to act like or impersonate living things 5. To explain how technology can be a distraction and identify when I might need to limit the amount of time spent using technology	Children will be able to: - Describe how to search over multiple platforms and are aware of the accuracy of the results presented. - Describe some of the methods used to persuade people to buy online. - Explain the difference between fact, opinion and belief and recognise these online. - Explain what a bot is and give examples of different bots. - Explain some positive and negative distractions of using technology and small strategies on how to reduce the amount of time spent on technology.	- 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 some sources are more trustworthy than others - 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**
	Programming 1: **Further coding with Scratch** 1. To recall the key features of Scratch 2. To understand how a Scratch game works by using decomposition to identify key features 3. To understand what a variable is and how to make one 4. To understand how to make a variable in Scratch	Children will be able to: - Understand how to create a simple script in Scratch – be able to change sprite and prevent the sprite from rotating. - Use decomposition to identify key features and understand how to decipher actions that make the quiz game work. - Understand what a variable is and how to use the 'say' and 'ask' blocks. - Create a variable and be able to use a variable to record a score. - Understand what a variable is and how it works within a program.	- 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**

	Data handling: **Investigating weather** 1. To log data taken from online sources within a spreadsheet 2. To design a weather station 3. To design an automated machine to respond to sensor data 4. To understand how weather forecasts are made 5. To use tablets or digital cameras to present a weather forecast	Children will be able to: - Search the web efficiently to find temperatures of different cities and record this accurately. - Design a weather station that gathers and records sensor data, explaining how it works and the units of measurement it would use. - Design an automated machine that uses selection to respond to sensor data. - Search for and record weather forecast information in a spreadsheet and explain how this data is collected. - Create a video which includes weather forecast information.	- Using tablets or digital cameras to film a weather forecast. - Understanding that weather stations use sensors to gather and record data which predicts the weather. - Using keywords to effectively search for information on the internet. Searching the internet for data. - Designing a device which 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. - 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. - To understand that weather forecasters use specific language, expression and pre-prepared scripts to help create weather forecast films.	**Accurate Backdrop Climate zone Cold Collaboration Condensation Cylinder Degrees Evaporation Extreme weather Forecast Heat sensor Lightning Measurement Pinwheel Presenter Rain Satellite Script Sensitive Sensor data Solar panel Tablet/Digital camera Temperature Thermometer Warm Weather**
	Programming 2: **Computational thinking** 1. To understand that computational thinking is made up of four key strands 2. To understand what decomposition is and how to apply it to solve problems 3. To understand what pattern recognition and abstraction mean 4. To understand how to create an algorithm and what it can be used for 5. To combine computational thinking skills to solve a problem	Children will be able to: - Understand that problems can be solved more easily using computational thinking. - Understand what the different code blocks do and create a simple game. - Understand the terms 'pattern recognition' and 'abstraction' and how they help to solve a problem. Create a Scratch program which draws a square and at least one other shape. - Understand how computational thinking can help to solve problems and apply computational thinking to problems they face.	- 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	Sequence of learning	Unit outcomes	Key skills and knowledge	*Vocabulary*
Year 5/6 **A**	**Online Safety** 1. To understand how apps can access our personal information and how to alter the permissions 2. To be aware of the positive and negative aspects of online communication 3. To understand how online information can be used to form judgements 4. To discover ways to overcome bullying 5. To understand how technology can affect health and wellbeing	Children will be able to: - Understand that passwords need to be strong and that apps require some form of passwords. - Recognise a couple of the different types of online communication and know who to go to if they need help with any communication matters online. - Search for simple information about a person, such as their birthday or key life moments. - 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.	- Understand that passwords need to be strong and that apps require some form of passwords. - Recognise a couple of the different types of online communication and know who to go to if they need help with any communication matters online. - Search for simple information about a person, such as their birthday or key life moments. - 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. - Identifying possible dangers online and learning how to stay safe. - Evaluating the pros and cons of online communication. - Recognising that information on the Internet might not be true or correct and learning ways of checking validity. - Learning what to do if they experience bullying online. - Learning to use an online community safely.	**Accurate information** **Advice App permissions** **Application Apps** **Bullying Communication** **Emojis Health** **In-app purchases** **Information Judgement** **Memes Mental health** **Mindfulness** **Online communication** **Opinion Organisation** **Password** **Personal information** **Positive contributions** **Private information** **Real world** **Strong password** **Summarise Support** **Technology**
	Computing systems and networks: **Search engines** 1. To understand what a search engine is and how to use it 2. To be aware that not everything online is true 3. To search effectively 4. To create an informative poster 5. To understand how search engines work	Children will be able to: - Explain what a search engine is, suggesting several search engines to use and explain how to use them to find websites and information. - Suggest that things online aren't always true and recognise what to check for. - Explain why keywords are important and what TASK stands for, using these strategies to search effectively. - Recognise the terms 'copyright' and 'fair use' and combine text and images in a poster. - Make parallels between book searching and internet searching, explaining the role of web crawlers and recognising that results are rated to decide rank.	- Developing searching skills to help find relevant information on the internet. - Learning how to use search engines effectively to find information, focusing 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** **Web crawler Website**

	Data handling: Mars Rover 1 1. To identify how and why data is collected from space 2. To read and calculate numbers using binary code 3. To identify the computer architecture of the Mars Rovers 4. To use simple operations to calculate bit patterns 5. To represent binary as text	Children will be able to: - Identify some of the types of data that the Mars Rover could collect (for example, photos). - Explain how the Mars Rover transmits the data back to Earth and the challenges involved in this. - Read any number in binary, up to eight bits. - Identify input, processing and output on the Mars Rovers. - Read binary numbers and grasp the concept of binary addition. - Relate binary signals (Boolean) to a simple character-based language, ASCII.	- Learning that external devices can be programmed by a separate computer. - 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. - To know that Mars Rover is a motor vehicle that collects data from space by taking photos and examining samples of rock. - To know what numbers using binary code look like and be able to identify how messages can be sent in this format. - To understand that RAM is Random Access Memory and acts as the computer's working memory. - To know what simple operations can be used to calculate bit patterns.	**8-bit binary Addition** **ASCII Binary code** **Boolean Byte** **Communicate Construction** **CPU** **Data transmission** **Decimal numbers** **Design Discovery** **Distance Hexadecimal** **Input Instructions** **Internet Mars Rover** **Moon Numerical data** **Output** **Planet Radio signal** **RAM Research** **Scientist Sequence**
	Creating media: **Stop motion animation** 1. To understand what animation is 2. To understand what stop motion animation is 3. To plan my stop motion video, thinking about the characters I want to use 4. To create a stop motion animation 5. To edit and assess my stop motion animation	Children will be able to: - Create a toy with simple images with a single movement. - Create a short stop motion with small changes between images. - Think of a simple story idea for their animation then decompose it into smaller parts to create a storyboard with simple characters. - Make small changes to the models to ensure a smooth animation and delete unnecessary frames. - Add effects such as extending parts and titles. - Provide helpful feedback to other groups about their animations.	- 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**

	Programming: **Programming music (Sonic Pi)** 1. To tinker with a new piece of software 2. To create a program that plays themed music 3. To plan a soundtrack program 4. To program a soundtrack 5. To program music for a specific purpose	Children will be able to: - terate ideas, testing and changing throughout the lesson. - Explain what the basic commands do: 'play', 'slee'p, '2.times do'. - Explain how their program links to the theme. Include a loop in their work. Correct their own simple mistakes. - Explain their scene in the story. Link musical concepts to their scene. - Include a live loop and explain its function. Use samples effectively to enhance music. - Code a piece of music that combines a variety of structures. - - Use loops in their programming. - - Recognise that programming music is a way to apply their skills.	- 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 program (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 Mindmap** **Music Output** **Performance** **Pitch Play** **Predict Programming** **Rehearsal Repetition** **Rhythm Sleep** **Sonic Pi Soundtrack** **Spacing**

Year Group	Sequence of learning	Unit outcomes	Key skills and knowledge	*Vocabulary*
Year 5/6 **B**	**Online Safety** 1. To describe issues online that give us negative feelings and know ways to get help 2. To think about the impact and consequences of sharing online 3. To know how to create a positive online reputation 4. To be able to describe how to capture bullying content as evidence 5. To manage personal passwords effectively 6. To be aware of strategies to help be protected online	Children will be able to: - Discuss a range of issues online that can leave pupils feeling sad, frightened, worried or uncomfortable and can describe numerous ways to get help. - Explain how sharing online can have both positive and negative impacts. - Be aware of how to seek consent from others before sharing material online and can describe how content can still be shared online even if it is set to private. - Explain what a 'digital reputation' is and what it can consist of. - Understand the importance of capturing evidence of online bullying and can demonstrate some of these methods on the devices used at school. - Describe ways to manage passwords and strategies to add extra security such as two-factor authentication. - Explain what to do if passwords are shared, lost, or stolen. - Describe strategies to identify scams. - Explain ways to increase their privacy settings and understand why it is important to keep their software updated.	- 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**
	Computing Systems and networks: **Bletchley Park** 1. To understand that there are lots of different types of secret codes 2. To understand the importance of having a secure password 3. To understand the importance of Bletchley Park to the World War II war effort 4. To understand about some of the historical figures that contributed to technological advances in computing 5. To research and present information about historical figures in computing	Children will be able to: - Explain that codes can be used for a number of different reasons and decode messages. - Explain how to ensure a password is secure and how this works. - Create a simple poster with information about Bletchley Park including the need to build electronic thinking machines to solve cipher codes. - Explain the importance of historical figures and their contribution towards computer science. - Present information about their historical figure in an interesting and engaging manner.	- Learning about the history of computers and how they have evolved over time. - Writing increasingly complex algorithms for a purpose. - Debugging quickly and effectively to make a program more efficient. - 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 the importance of having a secure password and what "brute force hacking" is. - To know that the first computers were created at Bletchley Park to crack the Enigma code to help the war effort in World War 2. - To know about some of the historical figures that contributed to technological advances in computing. - To understand what techniques are required to create a presentation using appropriate software.	**Acrostic Code Brute force hacking Caesar cipher Chip and pin system Cipher Code Combination Contribute Convince Date shift cipher Discovery Hero Invention Nth Letter Cipher Password Pig Latin Pigpen cipher Present Scrambled Secret Secure Technological advancement Trial and error**

	Data handling: Big Data 1. To identify how barcodes and QR codes work 2. To explore how infrared waves transmit data 3. To recognise the uses of RFID 4. To input and analyse real-world data 5. To analyse and evaluate data	Children will be able to: - Understand why barcodes and QR codes were created. - Create (and scan) their own QR code using a QR code generator website. - Explain how infrared can be used to transmit a Boolean type signal. - Explain how RFID works, recall a use of RFID chips, and type formulas into spreadsheets. - Take real-time data and enter it effectively into a spreadsheet. - Presenting the data collected as an answer to a question. - Recognising the value of analysing real-time data. - Analyse and evaluate transport data and consider how this provides a useful service to commuters.	- 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**
	Programming: **Introduction to Python** 1. To tinker with a new piece of software 2. To understand nested loops 3. To understand basic Python commands 4. To use loops when programming 5. To understand the use of random numbers	Children will be able to: - Iterate ideas, testing and changing throughout the lesson and explain what their program does. - Use nested loops in their designs, explaining why they need two repeats. - Alter the house drawing using Python commands; use comments to show a level of understanding around what their code does. - Use loops in Python and explain what the parts of a loop do. - Recognise that computers can choose random numbers; decompose the program into an algorithm and modify a program to personalise it.	- 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. - 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. - 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 Repeat Shape**