Computing Curriculum

EYFS:

EYFS	Development Matters	Early Learning Goals
Autumn 1: People who help us Autumn 2: Busy bodies Spring 1: Spring time Spring 2: Super space Summer 1: Summer time Summer 2: Boats ahoy!	• Learning is often driven by their interests • Making the time and space available for children to invent their own play. • Group work/guided learning • Guide thinking with visual aids • Make links between ideas.	• Communication and language. • Personal, Social and Emotional development. • Physical development • Literacy • Maths • Understanding the world • Expressive arts and design

Year One - Technology around us

National Curriculum Statements:
• Use technology purposefully to create, organise, store, manipulate and retrieve digital content. • Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies. • Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. • Create and debug simple programs • Recognise common uses of information technology beyond school. • Use logical reasoning to predict the behaviour of simple programs.

Prior Learning:	Future Learning:
• **EYFS – Tinkering** - Playing and exploring • **EYFS – Creating** - Checking and fixing things • **EYFS - Collaboration** - Playing and working collaboratively • **EYFS - Logic** - Anticipating and explaining	• **Computing systems and networks** • **Creating media** • **Programming** • **Data and information**

• **EYFS - Pattern** - Grouping things, comparing, spotting similarities and differences, working out rules • **EYFS – Abstraction** - naming and labelling, working out what is important, summarising • **EYFS - Algorithms and decomposition** - Responding to instructions, ordering and sequencing, breaking down problems	

Possible misconceptions	Assessment opportunities:
• A common misconception in this unit is around the term 'technology'. There is a misconception that technology must be digital or electronic. Whilst the word is now often used to refer to digital or electronic devices, the word technology means 'the use of scientific discoveries for practical purposes.	• **Formative assessment** - Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Technology around us			
Enquiry Question: What is technology and how can it help us?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To identify online risks and how to get help from a trusted adult.	• The internet is a fun and useful place for learning and play when used safely. • Know that writing untrue or mean things online can hurt people's feelings. • Know that there are trusted adults that can provide help and advice when we need it.	• Develop the ability to seek help and advice when something online feels wrong. • Recognise specific online challenges such as mean comments or sharing too much information.	Computer Safety Technology
To identify technology	• Technology is something man-made that helps us solve a problem or do a job. • Technology is everywhere; at home, in school and in shops. • Technology requires electricity to work. • Sorting objects into 'technology' and 'not technology'.	• To identify that technology is man-made and designed to help people by listing different types. • To identify and sort examples of technology in the immediate environment and explain their purpose.	Technology
To identify a computer and its main parts	• A computer is a specific type of technology that processes information. • Different parts have different jobs. Some parts let us talk to the computer and others let the computer talk to us.	• To use a mouse and a keyboard. • Name the main hardware components i.e., monitor, keyboard, mouse. • To switch on and log into a device. • Use a mouse to 'click' and 'drag' • Label a desktop computer and laptop correctly.	Click Computer Drag Hardware Keyboard Laptop Log on Monitor Mouse

To use a mouse in different ways	• A mouse uses a cursor to point at things. • A left-click selects things and a click and drag moves an item. • The movement of your hand on the desk is mirrored by the movement of the cursor on the screen. • Navigating a screen to open a folder or move an icon.	• Clicking, dragging and dropping • Use the mouse to double left click to open a specific program. • To demonstrate varied mouse control.	Click Double-click Drag Drop Keyboard Mouse Program Screen Type
To use a keyboard to type on a computer	• The keyboard is made of many keys: letters, numbers and symbols. The space bar is the longest key. • Pressing a key sends a digital signal to the computer to display the character.	• Typing individual characters to write their name. • Identify and use the CAPS lock/shift button to create capital letters. • Understand that when work is saved it can be retrieved from a specific place.	Capital letters Caps Lock Characters Keyboard Keys Save Shift Typing
To use the keyboard to edit text	• The backspace key removes mistakes. • The enter key moves the cursor to a new line. • Editing is the process of changing or fixing work.	• To use the backspace to delete letters. • To locate a saved file on a desktop and open it by double clicking on the mouse. • Making changes to a text by highlighting and using the backspace to delete.	Backspace Create Cursor Delete Desktop Double-click Edit File Highlight Keyboard Letters Save Save

Year One - Digital writing

National Curriculum Statements:
• Use technology purposefully to create, organise, store, manipulate and retrieve digital content. • Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies. • Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions. • Create and debug simple programs

- Recognise common uses of information technology beyond school.
- Use logical reasoning to predict the behaviour of simple programs.

Prior Learning:	Future Learning:
• **EYFS – Tinkering** - Playing and exploring • **EYFS – Creating** - Checking and fixing things • **EYFS - Collaboration** - Playing and working collaboratively • **EYFS - Logic** - Anticipating and explaining • **EYFS - Pattern** - Grouping things, comparing, spotting similarities and differences, working out rules • **EYFS – Abstraction** - naming and labelling, working out what is important, summarising • **EYFS - Algorithms and decomposition** - Responding to instructions, ordering and sequencing, breaking down problems	• **YEAR 3 - Desktop Publishing** – Moving from writing to layout. Text can be moved, resized and combined with images. • **YEAR 6 - Web-page development** – Content creation for an audience.

Possible misconceptions	Assessment opportunities:
• Many pupils will have had no experience of word processing, but those who have are more likely to have seen it on a mobile device/tablet with a high degree of automation. They may expect this to happen when they are word processing on a computer. • Alongside this, there may be some confusion around uppercase/lowercase letters, as the keys on a keyboard are uppercase but the letter which shows on screen is lower case. If this is becoming a problem, you can purchase lower case keyboards, or stickers which convert keyboards from upper case to lower case.	• **Formative assessment** - Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Digital writing			
Enquiry Question: Is a computer better than paper and pen?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To form healthy habits online	• Technology can be used for learning, playing and communicating safely. • The internet can be fun, but there are rules that help to keep us safe.	• Identify trusted adults who can help with worried. • Recognise that some information is safe and some is unsafe to share.	App Computer Device Internet Online

	• Personal information belongs to us, and should be kept private. • Feel confident to talk to a trusted adult if anything is worrying.	• To make simple choices that help keep them me safe when using technology. • Recognise examples of kind and unkind online behaviour.	Private Safe Tablet Technology Trusted adult Unsafe Website Worry
To use a computer to write	• A word processor is a type of software used specifically for writing. • A keyboard is an input device used to send letters to the screen. • Computers are tools that help us create digital documents. • Opening a specific writing program and identifying that the cursor shows where the next letter will appear.	• To open a word processor and understand its purpose for writing. • Finding specific keys like letters, numbers and the space bar. • Use the Enter key to start new lines. • To use the save function to save work to a specific place. • Pressing keys (input) creates letters and words on the document (output)	Enter Input Keyboard Keys Letters Numbers Output Save Type Word processor
To add and remove text on a computer	• The space bar creates a gap between words. The backspace key deletes the character to the left of the cursor. • Unlike the pen on paper, digital text is not permanent and can easily be changed or undone. • Finding letter keys quickly and using the backspace key to fix a typo.	• To use specific keys for their unique purposes such as the Space bar (to add spaces), Enter (to start a new line) and Backspace (to delete/edit)	Backspace Delete Edit Enter Keyboard Keys Letters Numbers Space bar
To identify that the look of text can be changed on a computer	• A font is the style or shape of the letters. • Size refers to how big or small the text is. • Colour can be changed using a palette tool. • Digital text is flexible; you can change its appearance after you have written it. • Using a mouse to click and drag to select (highlight) a word before changing its look.	• To recognise Caps Lock and Shift change lower case letters to upper case. • To be able to relay what each key on the keyboard does. • To describe specific tools in the toolbar and how they can change the text.	Bold Capital letter Caps Lock Font colour Highlight Italic Keyboard Keys Letters Shift Text Toolbar Type

			Underline
To make careful choices when changing text	• Formatting tools should be used for a reason i.e. a bold title. • Design choices affect how easy a document is to read. Using too many colours or tiny fonts can make an unreadable document. • Choosing a font that 'matches' the mood of a sentence.	• To left click on the mouse to select and double-click to highlight text. • To apply formatting such as Bold, Italic and Underline.	Bold Double-click Highlight Italic Left click Right click Select Underline
To explain why I used the tools I chose	• Review the names of the tools: 'font style', 'font size', 'text colour'. • Evaluation is thinking about whether the work meets its purpose. • Articulating why a specific change was made.	• To understand that the undo button can revert text and the backspace can get rid of letters/words. • To double-click and hold the left click to drag and rearrange text.	Backspace Change Cursor Double-click Drag Left click Mouse Redo Select Toolbar Tools Undo
To compare typing on a computer to writing on paper.	• Writing by hand uses a pen/pencil, writing digitally uses a keyboard/screen. • Different tools have different strengths. • Identifying that mistakes are easier to erase on a computer and that you can make many copies of digital work.	• To identify that digital writing can be shared or printed for others to read.	Digital Printed Shared Writing

Year One - Moving a robot

National Curriculum Statements:

- Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.
- Create and debug simple programs

Prior Learning:	Future Learning:
• **EYFS – Tinkering** - Playing and exploring • **EYFS – Creating** - Checking and fixing things • **EYFS - Collaboration** - Playing and working collaboratively • **EYFS - Logic** - Anticipating and explaining • **EYFS - Pattern** - Grouping things, comparing, spotting similarities and differences, working out rules • **EYFS – Abstraction** - naming and labelling, working out what is important, summarising • **EYFS - Algorithms and decomposition** - Responding to instructions, ordering and sequencing, breaking down problems	• **YEAR 2 - Robot algorithms** – Children learn to create an algorithm. Designing a sequence to solve a specific problem like navigating a floor map.

Possible misconceptions	Assessment opportunities:
• A common misconception when pupils first use floor robots, or with any early programming, is the idea that if the Bee-bot does not reach it's intended destination that the Bee-Bot 'didn't do what they asked it to'. • If the floor robot doesn't behave as we expect, the problem is with the program we put onto it, not the robot not behaving.	• **Formative assessment** - Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Moving a robot			
Enquiry Question: Can we tell a robot what to do?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To recognise that AI is a tool made by humans and how it can make mistakes.	• Understand what AI is and recognising its presence in everyday life. • Understand the importance of protecting personal information when interacting with AI. • Recognising that AI generated content can be inaccurate, fabricated or misleading.	• Question the reliability of AI. • Spot potential harmful content or chatbots who have negative intent. • Develop safe choices by applying safe filtering.	Artificial Intelligence (AI) Online Robot Safety
To explain what a given command will do	• A command is a single instruction for a computer or robot. • Buttons on a robot are inputs.	• Identify the symbols for 'forwards', 'backwards', 'left turn' and 'right turn'.	Backwards Bee-bot

	• Robots do not think for themselves. They follow the exact button pressed.	• To understand that a robot only follows specific instructions.	Forwards Instructions Left turn Right turn Robot
To act out a given word	• An algorithm is a precise set of ordered instructions. • Being a 'human robot' requires following instructions exactly without adding extra steps.	• To move a physical distance in response to a single spoken command.	Algorithm Command Instructions Robot
To combine 'forwards' and 'backwards' commands to make a sequence	• A sequence is when two or more commands are put together in a specific order. • The order of the sequence changes the final result.	• Press a series of buttons and then 'go' to execute the program.	Commands Program Sequence
To combine four direction commands to make sequences	• A turn command (Left or Right) makes the robot spin on the spot but does not move it to a new square. • Moving and turning are two separate actions. • To go around a corner, you must turn and then move forward.	• Use all four directional keys to navigate a simple path. • Incorporate turn commands i.e., turn right 90 degrees.	Command Direction Left Move Navigate Right Robot Turn Turn
To plan a simple program	• Planning happens before touching the robot to avoid mistakes. • Breaking a journey into small, individual steps is called decomposition.	• Use instruction cards or drawing arrows on paper to represent the robot's journey before pressing the buttons. • Debug programs by identifying and correcting incorrect instructions. • Plan, create and debug their own program to achieve a given purpose.	Debug Instruction Program Robot
To find more than one solution to a problem.	• Debugging is the process of fixing a program that isn't doing what you expected • There is often more than one 'right way' to reach a destination.	• Compare two different sequences that reach the same goal and identifying which one is faster or more efficient.	Debug Efficient Program Sequence

Year One - Programming animations

National Curriculum Statements:

- Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions
- Create and debug simple programs
- Use logical reasoning to predict the behaviour of simple programs

Prior Learning:	Future Learning:
• **YEAR 1 - Moving a robot** – Moving from a physical robot to an on screen 'Sprite'.	• **YEAR 2 - Programming quizzes** – Adding events to trigger blocks. • **YEAR 3 - Repetition in games** – Using repetitive strings of blocks to form loops to do the same movement more efficiently. • **YEAR 4 – Events and actions in programs** – A program can wait for different events to trigger different actions.

Possible misconceptions	Assessment opportunities:
• This is likely to be the first-time pupils have experienced on-screen programming, so addressing the difference between floor robots and on-screen programming is important to prevent misconceptions forming. • In Scratch Jr, a sprite can move forwards, backwards, up and down. The turn block changes the sprites appearance, but not how the sprite moves. This is different to a Bee-bot, which can only move forwards and backwards, and which turns on the spot.	• **Formative assessment** - Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Programming animations			
Enquiry Question: How can we make characters move and interact on a screen?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To recognise feelings of being unsafe or worried online.	• Understand that while the internet is fun, some content can be upsetting or scary. • Recognise that a 'funny tummy' feeling is a signal that something you are watching may be wrong. • Know that it is not your fault if you see something that makes you feel uneasy.	• Identify specific emotions in response to digital content. • Observe and differentiate between 'fun' videos and those that might cause uneasiness. • Practice verbalising a worry to an adult.	Content Emotions Internet Online Safety Safety Uneasy
To choose a command for a given purpose	• A sprite is a character or object on the screen that can be programmed. • A programming block is a digital command.	• To drag a block into the 'script area' to make a sprite perform one action, such as moving forward.	Action Area Block

	• Each block has s specific job.	• Navigate a menu or palette to find specific blocks.	Command Programming ScratchJr Sprite
To show that a series of commands can be joined together.	• Understand the concept of a sequence. • Know that commands run from top to bottom, or left to right. • That a 'start' block is often needed to trigger a sequence.	• Use drag-and-drop to move blocks onto a workspace. • Physically snapping blocks together locks into a single script.	Area Block Program Script Workspace
To identify the effect of changing a value	• A value is a number within a command that can be changed (e.g., steps, degrees, or seconds). • Understanding that a larger number might make a sprite move further or wait longer.	• Selecting a number field within a block to edit it. • Using an on-screen keypad or keyboard to input a new digit.	Block Command Edit Input Program Sprite
To explain that each sprite has its own instruction	• To know that a sprite is an object/character that can be programmed independently. • Understanding that code only applies to the sprite it is attached to (e.g., coding the "Cat" won't move the "Dog").	• Toggling between different sprites in the "sprite list" or selector to view their individual code. • Adding or deleting sprites to a project. • To input a specific command for Sprite and for it to follow that command.	Add Code Command Delete Edit Program Reset Sprite Start
To design the parts of a project	• A project is made of both code (instructions) and artwork (sprites/backgrounds). • Understanding that a project should be planned (designed) before it is built.	• To use basic paint tools (brush, bucket, rubber) to create or edit a sprite or backdrop. • Labelling or naming objects within a design.	Background Change Delete Edit Edit Program Run Sprite Start
To use my algorithm to create a program	• Understanding that an algorithm is a precise plan, while a program is that plan turned into code. • 'Debugging' is the process of fixing errors when the program doesn't match the algorithm.	• Verbally explaining or drawing a plan (the algorithm) for what they want their animation to do. • Testing their code and comparing the animation on screen to their original plan.	Algorithm Animation Code Compare Design Program

Year One- Grouping data

National Curriculum Statements:
• Use technology purposefully to create, organise, store, manipulate and retrieve digital content • Recognise common uses of information technology beyond school.

Prior Learning:	Future Learning:
• **EYFS – Tinkering** - Playing and exploring • **EYFS – Creating** - Checking and fixing things • **EYFS - Collaboration** - Playing and working collaboratively • **EYFS - Logic** - Anticipating and explaining • **EYFS - Pattern** - Grouping things, comparing, spotting similarities and differences, working out rules • **EYFS – Abstraction** - naming and labelling, working out what is important, summarising • **EYFS - Algorithms and decomposition** - Responding to instructions, ordering and sequencing, breaking down problems	• **YEAR 2 - Pictograms** – Taking groups and quantifying them. Representing data visually where one image equals one object. • **YEAR 3 – Branching databases** – Identifying objects based on their characteristics. • **YEAR 4 - Data Logging** – Computers collect data automatically using sensors. • **YEAR 6 – Introduction to Spreadsheets** – Moving into statistical analysis of data using formulas to calculate sums, averages and totals.

Possible misconceptions	Assessment opportunities:
• Much of this unit will be familiar from pupils' mathematics and early years education. However, pupils may find grouping the images difficult if they consider them all as images rather than the objects they represent.	• **Formative assessment** - Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Grouping data			
Enquiry Question: How is information organised?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To understand how to keep your information safe online	• Identify specific data points that must remain private i.e., full names, home address, phone number and school. • Understand that passwords act like a key to a house, locking personal accounts.	• To apply a strong password recipe by combining capital letters, lowercase letters, numbers and symbols.	Data Key Online Password Private

	• Recognise anything shared online can remain there forever.	• Develop the ability to spot 'red flags' such as emails with poor spelling or requests for passwords from strangers.	Safe Strong
To describe objects using labels	• To understand that objects have many different labels. • Name different objects and place them into groups. • Label a group of objects. • Understand that an object can fit into more than one group depending on the context.	• To identify and assign name labels to digital images. • Match digital objects to specific group labels using 'drag-and-drop' actions. • Determine the most appropriate label for a collection of diverse objects.	Group Image Label Object
To group and count	• Demonstrate the ability to count a small number of objects before they group them. • To count groups of objects with the same label. • Learn that computers are not intelligent and require input from humans to perform tasks.	• Explain that a computer cannot group or count objects until a human provides the input and rules. • Use a digital tool to count and verify the total number of objects in a pre-labelled group.	Count Group Input Object
To describe an object	• Understand that objects can be described in different ways. • Identify the properties of objects and begin to understand that properties can be used to group objects i.e., colour or size. • Demonstrate their ability to find objects with similar properties and understand the reason for labels.	• Identify similar properties (attributes) across different digital objects to justify grouping. • Describe an object by its digital properties to make it searchable for a computer.	Colour Objects Properties Properties Shape Size
Making different groups	• To group objects by properties. • To explain how the groups have been made. • Demonstrate the ability to count these different groups.	• Formulate a 'rule' for sorting and apply it across a dataset. • Explain how the same set of data can be reorganised into different structures by changing the property focus.	Data set Properties
Answering questions	• Decide how to group objects to answer questions. • Compare groups by thinking about how they are similar or different. • To share ideas in a group.	• Select the correct grouping method to solve a specific problem i.e., 'which group has the most objects?' • Compare digital groups to identify similarities and differences in the data results. • Share and record digital findings with peers explaining the logic behind the data structure.	Data set Fewest Group Least Less More Most The same

Year One- Digital painting

National Curriculum Statements:
• Use technology purposefully to create, organise, store, manipulate and retrieve digital content. • Recognise common uses of information technology beyond school.

Prior Learning:	Future Learning:
• **YEAR 1 - Computing systems and networks** – Learning that a mouse or touchscreen is an input device to tell software where to place something on the screen.	• **YEAR 2 – Digital photography** – Instead of making an image from scratch, children learn to capture it using a camera. • **YEAR 3 - Stop-frame animation** – Taking a series of photographs to be played in a sequence using the same creative techniques. • **YEAR 4 - Photo editing** – Manipulation and purpose of a photograph or artwork for a specific purpose.

Possible misconceptions	Assessment opportunities:
• A common misconception with this unit is that the eraser tool is the best tool to use if a pupil makes a mistake. However, the eraser tool will erase all layers of the painting. If a pupil wants to 'erase' something they have just painted which overlaps with another part of their painting, the undo tool is the better option.	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Digital Painting			
Enquiry Question: How can we use a computer to create art?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To understand that you need permission to use digital things.	• Digital things have owners. • You must have permission to use digital things. • Even when permission has been given, there are still rules about what can be done with the digital thing. • Identify who owns a digital thing.	• Decide who owns a digital object and whether permission has been given to use it. • Evaluate different digital scenarios and justify their decisions. • use evidence to determine ownership in a specific scenario.	Copyright Creator Digital Digital object Online Owner Ownership Permission Rules Share Technology Use
To describe what different freehand tools do	• Know that digital tools like the 'paintbrush' make marks and the 'eraser' removes them.	• To identify and select specific freehand tools from a toolbar.	Computers Mouse

	• Understand that different brushes in a program (like Paint) can create different artistic effects, such as thin lines or spray-paint textures.	• To use a mouse to click, drag and 'paint' marks on a screen.	Paint Paint program Paintbrush Painting Pictures Tool Toolbar
To use the shape tool and the line tools	• Understand that computers have specific tools for drawing geometric shapes (square, circles) and straight lines. • Recognise that tools require different interactions than freehand drawing.	• Select a 'line' or 'shape' tool and use it in specific forms. • To use tools to recreate simple patterns or the work of a structured artist.	Line Patterns Shape Tool Toolbar
To make careful choices when painting a digital picture	• Know that "careful choices" include selecting appropriate colours**,** brush sizes, and specific tools to achieve a desired outcome. • Understand that digital paint can be changed or "undone" using the 'undo' tool if a choice doesn't work out.	• Purposefully change the colour and thickness of a brush before making a mark. • Use the 'fill' tool to add colour to a closed shape effectively.	Brush size Brush style Colour Painting Tool Toolbar Undo
To explain why tools are used	• Understand that different tools are designed for different jobs i.e., the 'fill' tool is faster for large areas and the pencil is better for fine details.	• To articulate the reasoning behind a choice.	Fill Paint Painting Tool Toolbar
To use a computer independently to paint a picture	• Know the basic operational steps of digital painting i.e., opening the application and using the 'canvas area'. • Understand that digital work belongs to the person who has created it.	• Navigate a paint program independently. • Demonstrate an ability to combine various tools to create a final piece (in the style of an artist)	Canvas Computers Paint program
To compare painting a picture on the computer to on paper.	• Recognise that digital painting and paper painting are different media.	• Compare and contrast the two experiences, identifying which they prefer and why. • Observe that digital screens use pixels to form images, whereas paper uses pigment from paints, pencils and pens.	Paint program Painting

Year Two- Programming quizzes

National Curriculum Statements:
• Understand what algorithms are; how they are implemented as programs on digital devices and that programs execute by following precise and unambiguous instructions. • Use logical reasoning to predict the behaviour of simple programs. • Use technology purposefully to create, organise, store, manipulate and retrieve digital content.

Prior Learning:	Future Learning:
• **YEAR 1 - Programming animations** – Pupils create a sequence of blocks that run automatically and how to begin the code.	• **YEAR 3 - Repetition in games** - Using repetitive strings of blocks to form loops to do the same movement more efficiently. • **YEAR 4 – Events and actions in programs** – Children move from flat animations to interactive software. • **YEAR 5 - Selection in quizzes** – Decision making. The character only moves if a specific condition is met (the user types the correct answer). • **YEAR 6 - Sensing movement** – Sprites only move because they sense something in their environment.

Possible misconceptions	Assessment opportunities:
• In this unit, pupils learn that different sequences can have the same outcome. Whilst this is an important teaching point, it is also important that pupils still understand that though the final outcome is the same, the order of the sequence can still be important. • Alongside showing pupils the sequences on the screen, demonstrate them running in Scratch Jr simultaneously to show that though the outcome is the same, the movement to get there is different.	• **Formative assessment** - Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Programming quizzes			
Enquiry Question: How can we make a program react to what a user does?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To understand what content is safe and what content is unsafe.	• Understand that computers, tablets and phones are like 'Magic windows' that let us see into different world. • Know that what happens behind the screen is not always real, but the feelings it gives us are.	• Link the story of Hanni to personal uses of devices at home and school. • Identify the type of content that makes us feel happy verses scary or worried. • Draw or list their personal safety network.	Device Network Screen Secret Tablet Trusted adult
To explain that a sequence of commands has a start	• Understand that a computer program needs a specific trigger or instruction to begin running.	• Identify and use a 'start' block to initiate a sequence of commands.	Block Code

	• Know that this is often a 'start' block like a green flag.	• Demonstrate how to 'run' a program once it has been built.	Command Program Run Sequence Start
To explain that a sequence of commands has an outcome	• Know that the outcome is the final result or behaviour produced by a program. • Understand that changing the order of commands in a sequence will likely change the final outcome.	• Predict the outcome of a given sequence of blocks before running it. • Match different command sequences to their corresponding outcomes.	Blocks Command Sequence Sequence
To create a program using a given design	• Understand that a design is a plan for what a program should do. • Recognise that programmers often follow a design to ensure the final product meets a specific goal, such as asking a quiz question.	• Translate a simple algorithm or visual plan into a working program. • To choose the correct blocks to match the steps in a design.	Algorithm Blocks Code Command Design Features Program
To change a given design	• Understand that a program's design can be modified to create a different outcome or add new features. • Know that modifying involves purposefully changing or editing specific parts of a plan.	• Edit an existing program or plan to change its coding.	Change Code Edit Features Modify Program
To create a program using my own design	• Understand the cycle of design – code – test. • Recognise that creating a personal design involves making independent choices about characters, backgrounds and the running of the quiz.	• Plan quiz questions with multiple outcomes. • Build a sequence of blocks needed to make the quiz function.	Actions Blocks Code Project Sequence
To decide how my project can be improved	• Know that 'debugging' is the process of finding and fixing errors in a program. • Understand that a project can be made better by making it more efficient.	• Test the complete program to see if it works as intended. • Identify specific areas for improvement, such as fixing a bug or adding a new level to the quiz.	Change Debug Design Evaluate Fix Program

Year Two- Robot algorithms

National Curriculum Statements:

- Understand what algorithms are; how they are implemented as programs on digital devices; and that programs execute by following precise and unambiguous instructions.
- Use logical reasoning to predict the behaviour of simple programs.

Prior Learning:	Future Learning:
• **YEAR 1 – Moving a robot** – Learning through trial and error.	• **YEAR 3 - Repetition in shapes** – Children learn that if an algorithm has a repeating pattern or 'loop', they can use a repeat block to make the code shorter and more accurate. • **YEAR 4 - Sequencing sounds** – Uses algorithms to reach an auditory destination.

Possible misconceptions	Assessment opportunities:
• A common misconception when pupils first use floor robots, or with any early programming, is the idea that if the Bee-bot does not reach it's intended destination that the Bee-Bot 'didn't do what they asked it to'. • If the floor robot doesn't behave as we expect, the problem is with the program we put onto it, not the robot not behaving.	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Robot algorithms			
Enquiry Question: Can we create a debug a program?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To understand that words online can hurt others and how to show digital kindness.	• Understand that cyberbullying means using technology to be mean on purpose and that digital words hurt just as much as physical ones. • Recognise that people say things online because they are hidden behind a screen. • Know what a bystander is and why it can make bullying worse.	• Practice using specific language to stop unkindness i.e., "That isn't funny, let's stop". • Evaluate a message of 'joke' before it is sent to decide if it is helpful, kind or necessary.	Anonymity Bystander Consequence Cyberbullying Digital Footprint Kind Unkind Upstander
To describe a series of instructions as a sequence.	• Understand that an algorithm is a precise set of instruction to perform a task. • A sequence is a series of instructions that must be followed one after another, in a specific order to achieve an outcome.	• Break down a simple task into separate, clear steps. • Use vocabulary like 'forward', 'backward' and 'turn' to describe movements. • Give clear instructions.	Algorithm Backward Clear Command Forward Instruction

	• Instructions must be completely clear so the robot doesn't get confused.		Left Program Right Sequence Unambiguous
To explain what happens when we change the order of instructions.	• Know that changing the order of instructions in a sequence changes the final result. • Recognise that robots follow instructions literally, so the input needs to be specific and clear.	• Use the same instructions to create different algorithms. • Use an algorithm to program a sequence on a floor robot. • Show the difference in outcome between two sequences that consist of the same instruction.	Clear Command Instruction Outcome Sequence
To use logical reasoning to predict the outcome of a program.	• Understand that logical reasoning means using what you have already learnt or know to work out what will happen.	• To look at a program and know where the robot will end up by tracing its instructions, before starting.	Clear Command Instructions Logical reasoning Outcome Program
To explain that programming projects can have code and artwork.	• Understand that a program often uses visual elements like a mat or route with obstacles.	• Design a mat for a floor robot.	Artwork Design Mat Program Route
To design an algorithm.	• Know that an algorithm is the plan created. • Understand that a good design involves identifying the final goal and the steps needed to reach it successfully.	• Plan a route to show how a robot should travel from one point to another.	Algorithm Design Outcome Sequence
To create and debug a program.	• Understand that a program is the implementation of an algorithm. • Debugging is the process of finding and fixing mistakes. • Errors may be caused by missing steps, putting instructions in the wrong order or pressing the wrong buttons.	• Input instructions into a robot and if there is a bug, identify what it is and fix it.	Algorithm Bug Debug Decomposition Error Outcome Predict Program

Year Two- Digital Photography

National Curriculum Statements:
• Use technology purposefully to create, organise, store, manipulate and retrieve digital content. • Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies.

Prior Learning:	Future Learning:
YEAR 1 – Digital painting – Children learn to use digital tools to create an image from scratch focusing on colour and shape.	• **YEAR 3 - Stop-frame animation** – A video is a fast sequence of still photos. Applying their skills of photography and apply them repeatedly to create the illusion of movement. • **YEAR 4 - Photo editing** – Learn that a digital photo can be changed and improved using software. • **YEAR 5 – Video production** – Using the technical skills of photography to film high-quality video footage.

Possible misconceptions	Assessment opportunities:
• It is important for pupils to understand that digital photographs do not always represent what was actually seen. They can be easily changed, for example through simple editing techniques. Simple editing is covered in the unit. Reinforcing that changing the photograph can improve it but means it doesn't represent the 'real world' any more is an important consideration when teaching this.	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Digital photography			
Enquiry Question: How can we use a camera to tell a story?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To demonstrate how to ask for permission before using someone else's work.	• Learn that just because something is on the internet, does not mean we can use it without permission. • Someone else's work, like a photo or video, belongs to them. • Understand that copying someone's work can have consequences.	• To advise others how to respect copyright and ownership online.	Copyright Credit Ownership Permission
To use a digital device to take a photograph.	• Identify that various devices i.e., tablets, phones can capture photos. • Understand the basic sequence of taking a photo.	• To hold a device steady, look at the screen/viewfinder, and press the shutter.	Camera Capture Device Digital

			Framing Image Photograph Screen
To make choices when taking a photograph.	• Understand the difference between landscape and portrait. • Know that the choice of orientation depends on the subject of the photograph.	• Decide on how to hold the device based on the subject (horizontal or vertical). • Explain why a photograph looks better in portrait or landscape format.	Digital Image Landscape Photograph Portrait Subject
To describe what makes a photograph.	• Identify the core components of a good quality photograph (lighting, subject and framing). • Light can make a photo look too dark or too bright and unclear.	• Identify the focal point or main subject in an image. • To discuss how to take a good photograph. • Improve a photograph by retaking it.	Camera Digital Flash Focus Format Framing Image Lighting Photograph Subject
To decide how photographs can be improved.	• Recognise common mistake such as fingers over the lens, blurriness or a subject being too far away. • To know the 'bin' icon is how to delete a photograph.	• Experiment with different light sources. • Explain why a picture may be unclear.	Clear Focus Lighting Photograph Unclear
To use tools to change an image.	• Editing software can change how a photograph looks after it has been taken. • Filters change colours to create different tints.	• Use a tool to achieve a desired effect. • Explain the choice to use a specific tool to change an image.	Compose Edit Filter Photograph
To recognise that photos can be changed.	• Understand that images seen online may not be real. • Recognise that photographs can be manipulated for a specific purpose.	• Apply a range of photography skills to capture a photograph. • To identify which photographs are real and which ones have been changed.	Digital Edit Filter Image Photograph

Year Two- Digital music

National Curriculum Statements:

• Use technology purposefully to create, organise, store, manipulate and retrieve digital content.

Prior Learning:	Future Learning:
• **YEAR 1 – Digital painting** – Using a computing to make intentional creative choices.	• **YEAR 4 - Sequencing sounds** – Using code to control a sequence. Children learn to use event blocks to trigger specific notes, building their own digital musical instrument. • **YEAR 6 - Audio production** – Applying their skills to multitrack editing and balancing audio layers to produce a professional podcast.

Possible misconceptions	Assessment opportunities:
• Pupils may express the misconception that the computer is 'making' the music during this unit. The computer is making the sounds, but the pupils composed the music. There was still human involvement. This is important as it reminds pupils that even when creating media using a digital device, there is still an element of creativity.	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Digital music			
Enquiry Question: Computer vs instrument			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
Identify how using a phone or device can affect daily life	• Technology can be useful for helping people communicate and learn. • Spending too much time online can affect important activities such as work, play and spending time with others. • Online activities should be balanced with offline activities.	• Identify helpful and not helpful uses of devices. • Explain how devices can help people in everyday life. • Suggest sensible choices of technology and how we can balance this. • Justify opinions about how useful technology can be.	Balance Choice Communicate Device Digital Online Responsible Screen time Technology
To say how music can make us feel.	• Understand that music is a form of communication. • Recognise different musical elements i.e., 'tempo' and 'pitch'.	• To identify simple differences in pieces of music. • Describe music using adjectives.	Communication Emotions Instrument Loud Music

			Open Patterns Pitch Quiet Rhythm Tempo
To identify there are patterns in music.	• Know that the music we hear is composed of patterns. • Understand that repeating musical pattern is called a 'rhythm' or 'loop'.	• Create a rhythm pattern. • Play an instrument following a rhythm pattern.	Instrument Loop Pattern Rhythm
To experiment with sound using a computer.	• Understand that a computer is a tool for creating and manipulating sounds. • Some software allows you to change a sound's pitch, volume or instrument type instantly.	• Connect images with sounds. • Use a computer to experiment with pitch.	Create Instrument Loud Pitch Quiet Volume
To use a computer to create a musical pattern.	• Understand that digital music is created by drawing notes. • To know that a computer can play these notes in a perfect, never-ending sequence or loop.	• Identify that music is a sequence of notes. • Explain that music can be played in different ways. • Select specific notes to build a short, repeating sequence.	Create Instrument Loop Notes Pattern Sequence
To create music for a purpose.	• Realise that music is created with a specific goal in mind like representing an image or telling a story.	• To add a sequence of notes to a rhythm. • Combine musical elements to communicate an idea to an audience.	Emotion Feelings Instrument Notes Rhythm
To review and refine computer work.	• Understand that the first version of a piece of music is called a 'draft' and can be improved. • Reviewing means listening back to the work critically.	• To review a piece of work. • To listen to a piece of music and describe how it makes you feel.	Edit Review

Year Two- Pictograms

National Curriculum Statements:
• Use technology purposefully to create, organise, store, manipulate and retrieve digital content.

Prior Learning:	Future Learning:
• **YEAR 1 – Grouping data** – Learning to group objects by attributes.	• **YEAR 3 – Branching databases** – Identifying a specific object based on its attributed. • **YEAR 4 – Data logging** – Computers count and record data automatically using sensors. • **YEAR 5 – Flat-file databases** – Data is organised into records and fields within a digital table. • **YEAR 6 – Introduction to Spreadsheets** – Use formulas to calculate sums and averages of data.

Possible misconceptions	Assessment opportunities:
• The j2e pictogram software used in this unit creates very simple pictograms, and uses a different symbol for each category on the pictogram. This is different to how pictograms are taught in common mathematics schemes where pupils are taught that the same symbol must be used for each category. The use of a single image throughout a pictogram helps with consistency when pupils are introduced to using many-to-one correspondence in pictograms where a symbol represents more than one, for example 2, 5 or 10.	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Pictograms			
Enquiry Question: How does data answer questions about the world?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To understand how to keep information private.	• Understand that apps and websites have settings that allow you to choose exactly who can see your information and photos. • Know that 'public' means anyone can see your posts and 'private' limits the audience to only people you know and trust. • Recognise posting your location can allow the wrong people to find you in the real world.	• Demonstrate how to check and change basic privacy settings on a familiar device. • Spot the clues that might accidentally give away private information to strangers.	Oversharing Private Profile Public Settings
Recognise that tally charts are used to count and compare objects.	• Understand that a tally chart is a quick way to record data as it is collected. • A single mark represents one item and a diagonal mark through four marks represents five.	• To record data in a tally chart. • Represent a tally count as a total. • Compare totals in a tally chart.	Data Groups Pictogram Record Tally chart Total

			Votes
To know that objects can be represented as pictures.	• Understand that a pictogram is a chart that uses pictures or symbols to represent data. • Know that each picture stands for a specific number of objects.	• To enter data into a computer. • To use a computer to view data in a different format. • To use pictograms to answer simple questions about objects.	Data Object Organise Pictograms Represent Tally chart Total
To create a pictogram.	• Understand the structure of a pictogram, including labels for each category and a title to explain what the data shows. • Recognise that the pictures must be the same size and lined up clearly to allow for easy comparison.	• Organise data in a tally chart. • To use a tally chart to create a pictogram. • Explain what a pictogram represents.	Compare Organise Pictogram Represent
Select objects by attribute and make comparisons.	• Understand that an attribute is a characteristic of an object, such as its colour, size, or shape. • Know that data can be sorted into groups based on these shared attributes.	• Tally objects using a common attribute. • Create a pictogram to arrange objects by an attribute. • To answer 'more than'/'less than' and 'most'/'least' questions.	Attribute Different Explain Group Least Less than More than Most Objects Pictogram Same
To recognise that people can be described by attributes.	• Understand that an attribute is a specific characteristic or quality that describes someone. • Recognise that people have many different attributes, some of which are physical (e.g., eye colour, hair colour) and some of which are preferences (e.g., favourite sport, favourite fruit). • Know that attributes are used to group people when collecting data for a survey.	• To choose a suitable attribute to compare people. • Collect data. • Create a pictogram and draw conclusions from it.	Attribute Collect Conclusion Data Data Explain Pictogram
Explain that we can present information using a computer.	• Recognise that using a computer to create charts is often faster and neater than drawing by hand. • Understand that computers can automatically turn numbers into different visual formats, making information easier for others to read.	• To use a computer program to present information in different ways. • Give simple examples of why information should not be shared.	Conclusion Count Diagram Explain Pictogram Present

Year Two- Information technology around us

National Curriculum Statements:
• Use technology safely and respectfully, keeping personal information private; identify where to go for help and support when they have concerns about content or contact on the internet or other online technologies. • Recognise common uses of information technology beyond school.

Prior Learning:	Future Learning:
• **YEAR 1 – Technology around us** – Learn to identify technology around us.	• **YEAR 3 - Connecting computers** – Explain how devices talk to each other as part of a network. • **YEAR 4 - The internet** – Learn that the IT devices we see around us are a part of a worldwide 'network of networks'. • **YEAR 5 – Systems and searching** – Explore the mechanics of how we find information across a global IT network. They begin to understand how search engines crawl the IT systems to rank and deliver data. • **YEAR 6 – Communication and Collaboration** – How humans use IT systems to work together.

Possible misconceptions	Assessment opportunities:
• In this unit, pupils identify information technology as a computer or anything that works with a computer. They may not recognise some devices, such as phones and tablets, as being computers as they may have a narrow view of what a computer is. • They may not see these devices as working with computers so may not classify them as IT.	• **Formative assessment** - Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Information technology around us			
Enquiry Question: What is Information Technology?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To explain why some things online may not be true and how to check.	• Understand that anyone can create content online which means some information is incorrect, biased or created to trick the viewer. • Know that 'clickbait' techniques such as bright colours and offers are tools used to make us click on things without thinking.	• Develop the habit of asking 'Who made this?' and 'Why did they make it?' • Identify clues that a website might not be trustworthy, such as strange addresses, spelling mistakes or offers on products.	Biased Clickbait Fact Incorrect Opinion Source

			Trustworthy
To recognise the uses and features of IT.	• Understand that Information Technology (IT) refers to any equipment that allows us to create, store, or communicate digital information. • Know that many different devices contain computers, such as tablets, laptops, and smartphones.	• Identify examples of computers. • Describe some uses of computers. • Identify a computer is a part of IT.	Communicate Computers Create Digital Information Technology (IT) Store
To identify the uses of IT in school.	• Recognise that schools use IT for specific purposes, such as interactive whiteboards for lessons, printers for worksheets, and tablets for research.	• Identify examples of IT. • Sort school IT by what it is used for and how it can help the school function. • Identify that some IT can be used in more than one way.	Information Technology (IT)
To identify IT beyond school.	• Understand that IT is found in many public places, such as shops (tills/scanners), hospitals (monitoring equipment), and libraries. • Know that devices often work together.	• To find examples of IT. • Sort IT by where it is found. • To discuss the uses of IT.	Information Technology (IT) Devices
To explain how IT helps us.	• Understand that IT makes tasks easier, faster, and more accurate. • Recognise that it helps us stay connected with people through messages and video calls.	• Recognise common types of technology. • Demonstrate how IT devices can work together. • To explain why we use IT.	Common Connect Devices Efficient Information Technology (IT) Technology
To explain how to use IT safely.	• Know that there are rules for using IT to keep us safe and healthy, such as taking breaks from screens and not sharing personal information.	• To list different uses of IT. • To talk about different rules for using IT. • To talk about how rules can keep us safe online.	Information Technology (IT) Online Rules Safe
To recognise choices are made when using IT.	• Understand that people make choices when using technology, such as deciding which app to use or how much time to spend on a game. • Recognise that being responsible means making sensible decisions to keep yourself and others happy.	• Identify the choices made when using IT. • To use IT for different types of activities. • Explain the need to use IT in different ways.	Information Technology (IT) Online Responsible Rules Safe

Year Three- Stop-frame animation

National Curriculum Statements:

• Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.

Prior Learning:	Future Learning:
• **YEAR 2 – Digital photography** - Learning the technical skills of taking a good photo, focusing and framing a subject.	• **YEAR 5 – Video editing** – Moving from creating movement frame-by-frame to capturing real-time movement.

Possible misconceptions	Assessment opportunities:
• Learners may believe the objects in the animations they watch are moving, or that it is a live video, however, stop motion is a filming technique which involves taking several pictures, as objects are moved in small increments. When the pictures are put together, it makes the objects appear to be moving. Animations take a long time to produce, with even a short clip. • Misconceptions relative to the software chosen should be considered. When recording, explain the importance of clicking the correct button to get to the right place in the animation before resuming and taking more photos (otherwise it will start adding photos into different parts of the animation).	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Stop-frame animation			
Enquiry Question: Are there other ways to create movement in film?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To explain why copying someone else's work without permission isn't fair	• Digital content has an owner • People own the things they create, including photographs, videos, drawings, music and written work. • Copying someone else's work without permission is unfair because the creator has put time and effort into making it. • Copyright helps protect people's creative work.	• Identify who owns a piece of digital content. • Explain why somebody might want their work protected. • Explain the consequences of copying without permission. • Suggest appropriate ways of using another person's work. • Give examples of digital content that is protected by copyright.	Copy Copyright Creator Credit Digital content Fair Ownership Permission Respect Share

			Unfair
Explain that animation is a sequence of drawings or photographs.	• Learn about simple animation techniques. • To explain how an animation/flip book works. • Understand that animation is a technique where still images are shown quickly to create the illusion of movement.	• To recognise that movement is many static images. • To create a physical flipbook.	Animation Frame Image Photograph Stop-Frame
To relate animated movement with a sequence of images.	• Understand that for movement to look smooth, objects must be moving a small amount each time. • Recognise that large gaps between positions result in jumpy movement.	• Capture a series of photographs using a digital device where an object moves incrementally. • Maintain a steady camera position to ensure the background remains consistent.	Animation Character Events Frame Image Media Movement Photographs Setting Stop-Frame Transition
To plan an animation.	• To know that a storyboard is a visual plan used to break a story into a sequence of scenes and shots. • Identify the key components of a story i.e., characters, setting and a beginning, middle and end.	• Create a storyboard that translates an idea into a series of planned frames. • Predict how many photographs might be needed for each part of the story.	Character Frame Image Photograph Sequence Setting Storyboard Transition
To identify the need to work consistently and carefully.	• Understand the concept of 'Onion Skinning'; a digital tool that shows a faint image of the previous frame to align the current one. • Realise that consistency in lighting and object placement is vital for a professional-looking result.	• Use the 'Onion Skinning' tool to make precise adjustments to characters or props. • Work to ensure the scene or set is not accidentally moved between shots.	Character Consistency Events Frame Image Onion Skinning Setting Stop-Frame
To review and improve an animation.	• Identify a criterion for a successful stop-motion clip. • Understand that deleting or re-taking a frame is often part of the process.	• Play back a sequence to identify glitches or frames that do not fit the flow. • Edit the timeline by removing or re-ordering frames to improve the narrative.	Delete Frame Sequence Stop-Frame

To evaluate the impact of adding other media to an animation.	• Understand that sound effects, background music and titles can change the mood or feel of an animation. • Recognise how a change in background can change the context of a character's actions.	• Select and import appropriate audio or text overlays that match the story. • Evaluate whether the media helped the audience understand the story better.	Evaluation Import Media

Year Three- Connecting computers

National Curriculum Statements:
• Understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable

Prior Learning:	Future Learning:
• **YEAR 1 - Technology around me** – Learn to identify the basic computer parts. • **YEAR 2 – Information Technology around us** -Focusing on where IT is used and why.	• **YEAR 4 - The internet** – Learn that the IT devices we see around us are a part of a worldwide 'network of networks'. • **YEAR 5 – Systems and searching** – Explore the mechanics of how we find information across a global IT network. They begin to understand how search engines crawl the IT systems to rank and deliver data. • **YEAR 6 – Communication and Collaboration** – How humans use IT systems to work together.

Possible misconceptions	Assessment opportunities:
• Learners may have misconceptions with classifying digital and non-digital devices. They should be aware that a digital device is capable of some processing, i.e. it has functions beyond being either on or off. When looking at inputs and outputs, learners may struggle to classify a tablet (iPad) as this can be identified as both an input and output. • When looking at networks, misconceptions may occur when identifying network devices. Be aware the images used are illustrative and are unlikely to be representative of the actual devices in your school network. • When looking at the internet, another misconception may be learners thinking that a Wi-Fi connection is an internet connection; this is wrong, it is just a wireless way of connecting to a network. Equally, learners may mention 3G, 4G, or 5G	• **Formative assessment** - Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

connections, which connect devices (usually smartphones) to the internet and not solely to a network.	

Connecting computers			
Enquiry Question: How to digital devices work together?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To identify the signs of online scams and how untrusted files can harm a computer system.	• Understand that malware is bad software designed to damage or take control of a device. • Know that some emails are phishing, designed to make you click a link or download a file by promising something in return. • Recognise that you should never open attachments or click links from people you don't know.	• Recognise a fake email by checking the sender's email address and the tone of a message before trusting its content. • Evaluate whether a digital offer seems too good to be true and decide on the safest action. • Identify the correct steps to take if a device begins acting strangely after a download.	Malware Attachment Phishing Link Digital Sender Email Download File
To explain how digital devices function.	• Understand that Input-Process-Output model. • Know that digital devices have a computer inside programmed for specific tasks.	• Explain that devices accept inputs and produce outputs. • To follow a simple process to describe how a device works. • Explain what makes a secure password.	Device Digital Device Input Input-Process-Output Output
To identify input and output devices.	• Define 'input' and 'output'	• Classify common hardware such as keyboards and mice as inputs and screens, speakers or printers as outputs. • To design a digital device.	Digital Digital device Input Output
To recognise how digital devices can change the way that we work.	• Understand the benefits of digital versus non-digital tools, such as speed, storage and ease of editing.	• Compare digital and non-digital processes for the same task. • Suggest some differences and similarities in how they are used.	Digital Non-digital
To explain how a computer network can be used to share information.	• Define a 'network' as a group of devices connected together to share data. • Understand that the internet is a network of networks.	• Explain the benefits of networking. • Discuss why we need a network switch.	Digital device Internet Network switch
To explore how digital devices can be connected.	• Know that devices can connect using physical cables or invisible radio waves i.e., WIFI or 4G/5G etc.	• Identify networked devices in the classroom/school environment. • Demonstrate how information can be passed between devices.	Cables Connection Device Digital device Network

			WIFI
To recognise the physical component of a network.	• Identify key parts of a network i.e., switch, server and wireless access point.	• Locate physical network components within school. • Describe the role of a switch in directing traffic across a network.	Network Server Sockets Switch Wireless Access Point

Year Three- Repetition in games

National Curriculum Statements:
• Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. • Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.

Prior Learning:	Future Learning:
• **YEAR 1 - Programming animations** – Writing long code to tell a character to move. • **YEAR 2 - Programming quizzes** – A program must wait for a command to begin.	• **YEAR 4 -Events and actions in programs** – An event causes an action. • **YEAR 5 - Selection in quizzes** – Adding selection to a program; a program repeats to check if a condition is met. • **YEAR 6 - Sensing movement** – Creating programs that sense the environment before beginning.

Possible misconceptions	Assessment opportunities:
• Learners may have misconceptions around the language used within this unit. They may believe that 'repetition' and 'loop' are different entities, but repeating commands can also be referred to as a 'loop'. • Children may also get confused between infinite loops and count-controlled loops, as both have different outcomes. Infinite loops can be repeated without an end (forever loop), whereas count-controlled loops will run for a set number of times (repeat _ times). • Learners may believe that infinite loops are the easiest to use, however programmers do not actually use infinite loops very often as they can get stuck, and the only way to stop them is to close the program and start again.	• **Formative assessment** - Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Repetition in games			
Enquiry Question: How can we use loops to make a game?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
Identify healthy choices when interacting with others online.	• Distinguish between a game friend and a real-life friend. People online may not always be who they say they are. • Games are designed to encourage players to spend real money and that this should never be done without permission from an adult. • Recognise that being respectful includes following game rules, not cheating and remaining that way whether a player wins or loses.	• Develop strategies to cool down or take a break if a game becomes frustrating or upsetting. • Work with peers to resolve conflicts that arise during multiplayer games without escalating the situation. • Evaluate the pros and cons of sharing information or making a purchase within a game environment.	Anonymity Block Game Griefing In-app purchase Moderator Mute
Develop the use of count-controlled loops.	• Understand that a count-controlled loop repeats a set of instructions a specific, set number of times. • Identify these loops are best for predictable patterns, like drawing a square or a character walking exactly five steps.	• Use a 'Repeat' block in Scratch to move a sprite across the screen. • Predict the outcome of a snippet of code. • Modify a snippet of code to create a given outcome.	Blocks Count-controlled loop Infinite loop Loop Programming Repeat Repetition Scratch Sprite
Explain infinite loops and count-controlled loops.	• Understand that an infinite loop (e.g., 'Forever' block) repeats a set of instructions indefinitely. • Recognise that games need infinite loops to constantly listen for player inputs or collisions (like the wire in Operation).	• Choose when to use a count-controlled and an infinite loop. • Decide between when to use a 'Repeat' block vs a 'Forever' block based on the task.	Blocks Code Count-controlled loop Forever Infinite loop Loop Repeat Repeat Value
To develop a design with two or more loops.	• Understand that a single program can contain multiple loops that run at the same time or one after another. • Identify that different sprites often need their own separate loops to function independently	• Choose which action will be repeated for each object. • Build a Scratch project where one loop controls a timer whilst another controls the character's movement. • Evaluate the effectiveness of the repeated sequences used in a program.	Animate Code Evaluate Loops Program Refine Repeat Scratch
To modify an infinite loop.	• Understand that changing the code inside an infinite loop changes the behaviour of the entire program immediately.	• Identify which parts of a loop can be changed.	Animate Blocks

	• Recognise that if a 'Forever' loop is empty or has a mistake, the whole game might freeze or fail to react.	• Debug a loop that isn't working by checking the sequence of blocks. • To re-use existing code snippets on new sprites.	Bocks Code Debug Evaluate Forever Infinite loop Loops Program Refine Sequence
To design a project that includes repetition.	• Understand that decomposition is to break down a big game idea into smaller parts. • Identify where repetition is needed in a game design.	• Evaluate the use of repetition in a project. • Select key parts of a given project to use in a design. • Develop a design explaining what the project will do.	Animate Code Debug Design Evaluate Loops Repeat
To create a project that includes repetition.	• Understand that a 'Sensing' block must be placed inside an infinite loop for the game to detect a collision at any moment. • Realise that an 'if' or 'then' statement is used to trigger the 'buzzer' sound only when the wire is touched.	• Refine the algorithm in a design. • Combine a 'forever' loop an 'if', 'then', block and a 'sensing' block to create the core game mechanic. • Evaluate the steps followed when building a project.	Block Debug Evaluate Forever Infinite loop Modify Program Repetition Scratch

Year Three- Desktop publishing

National Curriculum Statements:
• Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.

Prior Learning:	Future Learning:
• **YEAR 1 - Digital writing and Digital painting** – Using a keyboard to enter text and the backspace to edit. Introduces colour, shape and digital tools to create a visual message. • **YEAR 2 - Digital photography** – Capture high-quality images.	• **YEAR 4 - Photo editing** – Changing the images by cropping, adjusting brightness and adding filters. • **YEAR 6 - Webpage creation** – Applying page orientation, headings and font consistency to make a webpage on a specific topic.

Possible misconceptions	Assessment opportunities:
• Learners may have misconceptions around typing skills. They should be aware that caps lock should only be used if they are typing a full sentence in capital letters. Shift should be used for single letters, as this is more efficient and uses fewer key presses. • There may also be misconceptions around the delete and backspace keys. The backspace key deletes to the left of the cursor, and the delete key deletes to the right. When considering their design, learners may think the more colours and effects used, the better their document.	• **Formative assessment** - Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Desktop publishing			
Enquiry Question: How do designers use text and images to capture our attention?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To explain how our online actions, build an online reputation.	• Understand that every action online leaves a digital trail of where they have been. • While some things can be deleted, online posts often stay forever, even if deleted. • Recognise that online actions can affect your reputation with friends, family, and your school.	• Evaluate online profiles or message threads to judge whether they show a positive or negative reputation. • Use a 'think before you post' check to decide if a piece of work, comment or an image is safe and kind enough to share online.	Digital footprint Negative Online reputation Positive Post Profile
To recognise how text and images convey images.	• To explain the difference between text and images. • Recognise that text and images can communicate messages clearly. • Identify the advantages and disadvantages of using text and images. • Understand how to use emojis respectfully online.	• Differentiate between text and image objects on a digital screen. • Use emojis appropriately and respectfully.	Advantages Communicate Disadvantages Emoji Images Text
To recognise that text and layout can be edited.	• Explain that text can be changed to communicate more clearly. • Know the terms for font properties: size, colour and style i.e., bold, italic and underline.	• Click and hold the left click to highlight/select specific text to apply a change. • Use the keyboard for editing text i.e., Return for a new line, Backspace for	Communicate Font Format Highlight Select

		deleting and Shift for capital letters/symbols. • Apply formatting tools to change font size and colour within software like Microsoft publisher or Canva.	Style
To choose appropriate page settings.	• Explain what 'page orientation' means and the difference between portrait and landscape. • Recognise placeholders and explain why they are important. • Create a template for a particular purpose.	• Toggle between portrait and landscape page settings. • Select and open a relevant template for a specific task i.e., a magazine cover.	Landscape Layout Page orientation Placeholders Portrait Template
To add content to a desktop publishing publication.	• Understand the concept of a 'text box' to begin typing anywhere on the page. • Recognise that images can be imported or copied and pasted from other sources on the internet.	• Choose the best location for content. • Copy and paste text and images. • Make changes to content after being added i.e., resize boxes and images to fit a specific layout.	Content Copy Images Layout Paste Text
To consider how different layouts can suit different purposes.	• Identify different layouts. • Match a layout to a purpose i.e., newsletter, brochure, magazine, poster or invitation. • Choose a suitable layout for a given purpose.	• Manipulate the position of objects on a page to improve visual appeal. • Evaluate a layout based on whether it effectively communicates its intended message.	Benefits Layout Purpose
To consider the benefits of desktop publishing.	• Identify the uses of desktop publishing in the real world. • Compare work made on desktop publishing to work created by hand.	• Use the undo function to reverse changes and experiment with design. • Save and share digital files. • To say why desktop publishing might be helpful in real-world careers like editorial design.	Benefits Desktop Publishing Save Share

Year Three- Repetition in shapes

National Curriculum Statements:

• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.

Prior Learning:	Future Learning:
• **YEAR 1 – Moving a robot** – Use individual commands to move an object. • **YEAR 1 – Programming animations** – Introduction to block-based programming (ScratchJr) • **YEAR 2 – Robot algorithms** – Plan a sequence to create a specific outcome.	• **YEAR 4 - Sequencing sounds** – Apply 'pattern-spotting' to music. Realising that repeat blocks can loop a rhythm. • **YEAR 4 - Events and actions in programs** – How to begin a program on Scratch and use actions to program a character to follow a command.

Possible misconceptions	Assessment opportunities:
• Learners may have the misconception that repetition is just about making things faster or easier, however it is a fundamental programming concept that allows for efficient and scalable code. • When using FMS Logo, learners may believe that slight variations in syntax or structure do not matter, and that the computer will understand what is meant. Even small errors such as misspelling (FWD instead of FD) or omitting a space (FD50 instead of FD 50), can cause a program to fail. They should learn that precision is important in coding. • Learners may also not realise that the turtle's position and orientations are relative to its current state. They may believe that the right and left code moves the turtle in that direction, however in reality it just turns the turtle on the spot the number of degrees stated.	• **Formative assessment** - Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Repetition in shapes			
Enquiry Question: How can we turn simple shapes into a repeated pattern?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To identify times or situations when someone may need to limit the amount of technology use.	• Spending time online can be enjoyable and helpful. • Everyone has different online habits and needs. • There are signs that someone may need a break from a screen, such as feeling tired, frustrated or upset. • Taking regular breaks can support health and wellbeing.	• Discuss how to use technology safely in daily life. • Identify positive and negative effects of spending time online. • Recognise when online activities are affecting their mental wellbeing.	Balance Delete Device Endlessly Focussed Offline Online

		• Suggest ways to maintain a healthy balance between online and offline activities.	Rota Screen time Scrolling Wellbeing
To identify that accuracy in programming is important.	• Understand that computers execute programs by following sequences of precise instructions. • Recognise that a small error can prevent a program from running correctly or producing the expected outcome.	• Identify and correct simple syntax errors in text-based code. • Type commands accurately into a program.	Code Command Logo Program
To create a program in a text-based language.	• Use a design template or diagram to represent the intended behaviour of a program before coding. • Write an algorithm to produce a given outcome, considering the order and structure of instructions. • Understand that an algorithm must be translated into code for a computer to execute it.	• input a sequence of individual commands to move and draw on the screen. • Translate a physical drawing or sketch into a written step-by-step algorithm. • Translate a written algorithm into formal code.	Algorithm Code Command Program Template
To explain what 'repeat' means.	• Identify repetition and recurring patterns within a sequence of instructions. • Recognise when a sequence of instructions could be made more efficient by using repetition. • Understand how a count-controlled loop repeats a sequence of instructions a fixed number of times.	• Identify sections of code where commands are repeated and could be replaced by a loop. • Modify the count in a loop to draw different regular polygons.	Code Commands Count-controlled loop Pattern Repeat Repetition
To modify a count-controlled loop to produce a given outcome.	• Identify the effect of changing the number of times a task is repeated. • Predict the outcome of a program containing a count-controlled loop by tracing the instructions step by step. • Understand which values to change in a loop.	• Change the values in an existing repeat command to fix a broken shape. • Trace code by following it step by step, to predict what the turtle will draw.	Command Count-controlled loop Repeat Trace Turtle Value
To decompose a task into small steps.	• Break down a problem into smaller parts by identifying repeated patterns and grouping actions together. • Understand that a procedure is a named set of instructions that can be reused within a program.	• Break down a complex drawing task into its component shapes. • Plan an algorithm before typing code.	Algorithm Decompose Procedure Repeat Snippet
To create a program that uses count-controlled loops to produce a given outcome.	• Design a program that includes count-controlled loops to achieve a specific goal. • Develop and improve a program by identifying, testing and fixing errors through debugging. • Make use of a design to write a program.	• Write and test a full program that uses at least one repeat loop. • Debug the program to fix errors.	Count-controlled loop Debug Design Program Repeat

Year Three- Branching databases

National Curriculum Statements:
• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.

Prior Learning:	Future Learning:
• **YEAR 1 - Grouping data –** Identifying shared properties. • **YEAR 2 – Pictograms** – A digital image can represent a real-world object or 'tally' of data.	• **YEAR 4 - Data logging** – Use sensors to capture attributes of an object. A data logger tracks when a value crosses a specific point, turning physical attributes into digital data. • **YEAR 5 - Flat-file databases** – Questions become search filters to find records in a table. • **YEAR 6 - Introduction to spreadsheets** – Using functions to calculate data.

Possible misconceptions	Assessment opportunities:
• Learners must be aware that questions within branching databases must have a yes/no answer. Learners could be prompted to start their questions using 'does it' and 'is it'. When looking at creating questions, they will be based on attributes, however this is simply another way to say 'properties. • Learners must think carefully about how they order the questions, as this will affect the branching database's structure. Learners need to know that it is important to order questions carefully to ensure that objects are separated as evenly as possible.	• **Formative assessment** - Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Branching databases			
Enquiry Question: Can we find the answer using only 'yes' or 'no'?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To search online using key phrases to find the right information	• Information found online is not always accurate or true. • Different websites can provide different information about the same topic. • Some websites may contain mistakes, opinions or misleading information.	• Discuss whether information appears trustworthy or unworthy. • Compare information from different websites.	Accurate Author Evidence Fact Information

	• The author, organisation or source of a webpage can provide clues about its reliability.	• Spot simple clues that suggest whether a website it reliable or unreliable. • Use evidence from a website to justify an opinion about its reliability. • Make informed decisions about whether to trust information found online.	Online information Opinion Pop-up Reliable Search words Source Trustworthy Unreliable Verify Website
To create questions with yes/no answers.	• Know the difference between open-ended questions and closed questions. • Understand that computers process information most effectively when it is narrowed down to a choice.	• Investigate and formulate simple questions about a collection of objects, where the answer is only 'yes' or 'no'. • Test questions to ensure they are not ambiguous.	Order Organise Questions Structure
To identify the attributes needed to collect data about an object.	• Understand the term attribute as a characteristic, feature, or property of an object i.e., colour, size or number. • Recognise that to distinguish one object from another, we can look at the attributes they possess.	• Observe a set of objects and list their physical and functional attributes. • Select the most effective attribute to split objects into two groups.	Attribute Information Objects Organise Selecting
To create a branching database.	• Define a branching database as a collection of data organised in a tree structure using yes/no questions. • Identify the components of a database.	• Use a digital tool to build a functional database. • Correctly order questions so each level of the tree leads towards a single object.	Branching database Data Database Decision tree Information Order Organise Select
Why is it helpful for a database to be well structured?	• Understand that a well-structured database is efficient because it allows users to find information using the fewest questions. • Know that an unbalanced database is slower and harder to use.	• Compare two different branching structures to identify which one is more direct and easier to follow.	Branching Compare Database Equal Structure Value
Plan the structure of a branching database.	• Understand that a database must be balanced. • Recognise that planning on paper helps prevent logical errors before moving to a computer.	• Decompose a large group of objects into smaller groups. • Identify which data is relevant for a specific purpose.	Databases Equal Objects Organise Value

Independently create an identification tool.	• Understand that the final part of the database must terminate to one specific object. • Know how to debug to fix a path that leads to the wrong answer.	• Create a complete database for a specific topic. • Check and correct the tool by having another peer use it.	Database Debug Object Select

Year Four- Sequencing sounds

National Curriculum Statements:
• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.

Prior Learning:	Future Learning:
• **YEAR 1 - Moving a robot** – giving simple step-by-step commands to control a robot. • **YEAR 1 - Programming animations** – children move from physical robots to on-screen sprites. • **YEAR 2 - Robot algorithms** – if commands are in the wrong order, the robot will not reach its goal. • **YEAR 2 - Programming quizzes** – understanding events like "when this sprite is clicked, sprite will…"	• **YEAR 5 - Selection in physical computing** – Using selection to make a computer check a condition first, before beginning the sequence. • **YEAR 6 - Variables in games** – Creating variables to change how sequences behave.

Possible misconceptions	Assessment opportunities:
• This unit introduces Scratch to learners. When using the software, learners should be aware that the colour of the coding blocks is important. The programming palette is organised into nine colour-code categories, and understanding this will help learners navigate the platform. For all projects to run, they must use an event command (e.g. when green flag is clicked) to start their program; learners often forget this, and as such their code will not start. • When working with multiple sprites on Scratch, learners may code the wrong Sprite. To avoid this, learners must click on the sprite to bring up its individual code tab, before starting.	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

• Learners will need to understand that an algorithm is a precise set of ordered instructions, and that this is different from a program. They will also need to be aware that the sequence of their coding blocks is important, with the computer carrying out the commands in that order.	

Sequencing sounds			
Enquiry Question: How can code turn a computer into a musical instrument?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To give simple examples of content which I must not use without permission from the owner.	• Different types of digital content have different owners and permissions. • Copyright helps creators maintain control over how their work is used and shared. • Using content without permission can affect the creator's ability to receive recognition or benefit from their work. • Responsible digital citizens consider ownership when selecting content for projects.	• Distinguish between content they have created themselves and content created by others. • Justify decisions about whether permission should be sought before using content. • Suggest alternative ways of obtaining content when permission has not been granted.	Attribution Copyright Copyrighted content Creator Digital content Intellectual Property License Ownership Permission Reuse Source
To explore a new programming environment.	• Identify and describe the key components of a Scratch project, including sprites, backdrops and the stage. • Explain that each sprite has attributes that can be changed, such as position, appearance and sound. • Recognise that commands in Scratch are represented as programmable blocks. • Understand that different coloured blocks represent different categories of actions (e.g., Motion, Sound, Events).	• Create a program following a design brief. • Match coding blocks to their actions. • Add and delete sprites or background. • Navigate the programming environment by clicking and dragging blocks.	Backdrop Blocks Motion Programming Scratch Sprite Stage
To identify that commands, have an outcome.	• Understand that each sprite follows its own sequence of instructions independently. • Predict how a sequence of blocks will affect the behaviour of a sprite.	• Click on individual blocks to observe their effect i.e., a sprite moving or making a sound.	Code Commands Glide Go to Point in direction Turn
To explain that a program has a start.	• Explain that programs execute exactly as the blocks are sequenced.	• Start a program in different ways. • Create a sequence of connected commands.	Code Event Run

To recognise that a sequence of commands can have an order.	• Understand that sequencing involves organising blocks in a precise order to achieve a desired outcome. • Understand that changing the order of blocks will change the behaviour of the program.	• Combine sound commands. • Order notes into a sequence. • Fix mistakes within a sequence.	Bug Chord Debug Note Order Sequence
To change the appearance of a project.	• Design the behaviour of multiple sprites within a single project. • Make purposeful design choices for visual elements and audio. • Understand that 'costumes' allow a sprite to change appearance during a program.	• Build a sequence of commands. • Select a new backdrop from the library to change the stage. • Switch between costumes within a sequence.	Backdrop Commands Costume Sprite Stage
To create a project from a task description.	• Identify and select appropriate objects (sprites and backdrops) for a project. • Translate a task description into a structured program design. • Plan, create and test a program using sequences of blocks.	• Implement algorithm as code. • Build a complete musical instrument project by combining sounds and movement. • Add visuals to a project based on a brief.	Algorithm Bug Debug Design Task

Year Four- 3D modelling

National Curriculum Statements:
• Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

Prior Learning:	Future Learning:
• **YEAR 1 – Digital painting** – Understanding of a digital canvas and object manipulation.	• **YEAR 4 – Photo editing** – Composition and how to manipulate digital assets to change their appearance by cropping, rotating and adjusting colour. • **YEAR 5 – Vector drawing** – A complex image is made by layering, grouping and resizing shapes. • **YEAR 6 – Sensing movement** – Using hardware to track an object's orientation in the real world.

Possible misconceptions	Assessment opportunities:

• Ensuring their designs 'line up' in all three dimensions. Pupils must repeatedly look at their design from different angles, and ensure it looks as expected from each. For example, a design can easily look 'lined up' viewed from the side, but from the top it becomes clear the shapes are offset.	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

3D Modelling			
Enquiry Question: Can simple shapes construct Greek architecture?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To understand how Artificial Intelligence is trained.	• Artificial Intelligence (AI) learns from data provided by humans. • AI systems cannot learn without being trained on data. • The information used to train AI is called input data. What it produces is called output data. • Ai does not learn in the same way that humans do; it identifies patterns within data. • The quality of an AI's output depends on the quality and quantity of the data it has been trained on.	• Identify examples of data that could be used to train an AI system. • Distinguish between an AI systems input and output. • Predict what an AI may be able to do based on the data it has been trained on. • Explain how data influences the performance of an AI system.	Artificial Intelligence (AI) Data Data set Generate Input Output Pattern Training data
To recognise how to work in three dimensions.	• 2D shapes have two dimensions (width and height) whilst 3D objects have three (width, height and depth). • How to use camera controls to look at a 3D canvas from multiple angles.	• Add 3D shapes to a project. • View 3D shapes from different perspectives. • Move 3D shapes relative to one another.	2D 3D Move Perspective Select Shapes Tinker CAD View
To identify that digital 3D objects can be modified.	• Know how to use specific handles to alter a shape's size across one, two or three dimensions. • Understand how to change an object's elevation to lift or lower it off the floor grid. • Digital objects possess properties that can be changed.	• Resize an object. • Lift and lower 3D objects. • Recolour a 3D object.	Handles Lift Lower Modify Recolour Resize
Recognise that objects can be combined in a 3D model.	• 3D shapes can be rotated around three different axes to orient them correctly. • Know how to copy and duplicate single or multiple 3D shapes.	• Rotate 3D objects. • Duplicate 3D objects. • Group 3D objects.	Combine Duplicate Group Rotate
Create a 3D model for a given purpose.	• Know how to read and input exact measurements. • Specialised placeholders can remove material to cut holes out of hollow shapes.	• Accurately size 3D objects. • Show that placeholders can create holes in 3D objects.	Cube Cylinder Hollow

	• Know how to position, scale and align components.	• Combine a number of 3D objects.	Placeholder
To plan a digital 3D model.	• Know how to visually break down real-world items and buildings into their basic shapes. • How to choose the most accurate 3D shape to execute a design. • Map out a building or project prior to working on the software.	• Analyse a 3D model. • Choose objects to use in a 3D model based on a design brief. • Combine objects in a design.	Choose Cone Cuboid Prism Pyramid Sphere
To create a digital 3D model.	• How to construct a complete project independently based on an initial design. • Check a digital build from multiple camera views to spot design flaws and adjust dimensions or placements.	• Construct a 3D model based on a design brief. • Explain how a 3D model could be improved. • Modify a 3D model to improve it.	Construct Evaluate

Year Four- The internet

National Curriculum Statements:
• Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable. • Understand computer networks including the internet; how they can provide multiple services, such as the world wide web; and the opportunities they offer for communication and collaboration. • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.

Prior Learning:	Future Learning:
• **YEAR 1 – Technology around us** – Knowing what technology is a categorizing device • **YEAR 2 – Information Technology around us** – IT means equipment that stores, processes and sends digital information. • **YEAR 3 – Connecting computers** – Recognising the internal and external parts of a computer or tablet and understanding it inputs data and outputs information.	• **YEAR 5 – Systems and Searching** – How to navigate the internet efficiently an understand the wider systems it relies on. • **YEAR 6 – Communication and Collaboration** – Create, share and collaborate on digital content.

Possible misconceptions	Assessment opportunities:
• A key misconception pupils face within this unit is that the internet and the World Wide Web are the same thing, which they are not. They internet is a global system of computer networks, whereas the World Wide Web is an application that runs on the internet, which can be accessed through websites.	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

• When looking at the World Wide Web, leaners may confuse search engines and browsers. Some learners may confuse Google as a browser, that 'Google' is needed to access to internet. However, a browser is a piece of software that retrieves and displays web pages, such as Chrome, Firefox, etc. In contrast, Google is a search engine that use crawlers to find specific information on the web. • Misconceptions around trusting what learners see on the internet, and the issues of fake news. There is a high volume of inaccurate, misleading, or false content on the internet, which learners need to be aware of, alongside the fact search results can be influenced by adverts and sponsored content.	

The Internet			
Enquiry Question: What is the internet and who is in charge of it?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To understand how a digital personality is created and the importance of protecting it.	• A digital footprint is the information that is created, collected and shared about a person through their online activity. • Digital footprints can be created by things people do online, such as posting photos, sending messages, commenting or content creation. • Other people can also contribute to someone's digital footprint by sharing information, images or comments about them. • Information shared online can sometimes remain available for a long time, even if it is later deleted.	• Explain how a digital footprint is created. • Distinguish between information they choose to share and information others may share about them. • Evaluate whether information is appropriate to share online. • Suggest strategies for protecting a positive online reputation.	Digital footprint Digital identity Online reputation Personal information Platform Post Private information Responsible Screenshot Share
Describe how networks physically connect to other networks.	• The internet is a network of networks. • A router is a specialised piece of network hardware designed to find paths and route data packets.	• Demonstrate how information is shared across the internet. • Discuss why a network needs protecting.	Internet Network Router Routing Switch Wireless access point (WAP)
To recognise how networked devices, make up the internet.	• Explain that the internet is used to provide many services. • Recognise that the World Wide Web contains websites and web pages.	• Identify in a room which gadget are connected via a network i.e., tablet or printer. • Give real-world examples of different things we can do online. • To separate web-browsing from other internet activities like online gaming or streaming videos.	Use Web page Website World Wide Web (WWW)

To outline how websites can be shared via the World Wide Web (WWW)	• The types of media that can be shared on the World Wide Web. • Describe where websites are stored when uploaded to the World Wide Web.	• Use a web browser to type in a web address (URL), click on links and find specific information on a page. • Describe how to access websites on the World Wide Web.	Download Files Link Server Web address Web browser
To outline how content can be added and accessed on the World Wide Web (WWW)	• Media can be found on websites. • Everyone can add content to the World Wide Web. • Internet services can be used to create content online.	• Find and name the person, group or company responsible for making content on the internet.	Content Information Sharing
To recognise how the content of the WWW is created by people.	• Websites and their content are created by people. • Understand who owns the content on websites. • Explain that there are rules to protect content.	• Recognise common signs of ownership on a webpage, such as the copyright symbol or an author's name.	Ownership Permission Security
To evaluate the consequences of unreliable content.	• Not everything on the World Wide Web is true. • Some information we find online may not be honest, accurate or legal. • Understand why we must think carefully before sharing or resharing content.	• Compare information from an unknown website against a trusted source to see if it matches. • Identify clues that show a website might not be honest such as missing author names, fake headlines. • Explain the safe rules of the internet and how they can be enforced.	Accurate Adverts Content Honest

Year Four- Data logging

National Curriculum Statements:
• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.

Prior Learning:	Future Learning:
• **YEAR 1 – Grouping data** – Answering simple questions by labelling, counting and sorting physical groups based on their attributes. • **YEAR 2 – Pictograms** – Manually collecting data through tally charts, then turning it into a picture.	• **YEAR 5 – Flat-file databases** – A database is an organised collection of data that can be easily searched and sorted. • **YEAR 6 – Introduction to spreadsheets** – Learn how to program software to calculate trends automatically.

• **YEAR 3 – Branching databases** – Separate data structurally by creating branching databases using yes/no questions.	

Possible misconceptions	Assessment opportunities:
• Learners may have the misconception that data logging is just about recording random information, however it involves systematically collecting data over time to analyse patterns. • When using data loggers, they may believe that all data collected by their data logger is accurate, although this misconception should be challenged, as the accuracy can be influenced by difference factors, such as sensor quality, environmental conditions and user errors.	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Data logging			
Enquiry Question: Can a machine collect data better than humans?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To describe strategies for keeping personal information private	• Personal information should only be shared with trusted people. • Different types of information have different levels of privacy (personal, private and public). • Privacy settings can help control who sees information online. • Cyberbullying can have a negative impact on people and should be reported to a trusted adult.	• Distinguish between personal, private and public information. • Evaluate whether information is safe to share online. • Give reasons for keeping certain information private. • Explain how privacy settings can help protect personal information. • Identify situations where information should not be shared. • Demonstrate how to respond appropriately to unwanted contact online.	Block Cyberbullying Digital footprints Personal information Post Privacy settings Private information Public information Stranger
To explain that data gathered over time can be used to answer questions.	• Data is raw numbers or measurements. It only becomes information when we use it to answer a question. • Collecting data over a long period of time makes answering questions more accurate.	• Choose a data set to answer a given question. • Suggest questions that can be answered during a given data set. • Identify data that can be gathered over time.	Data Layout Table

To use a digital device to collect data automatically.	• Data can be collected using sensors. A sensor is a type of hardware that reads the physical world and turns it into digital numbers. • Identify that data from sensors can be recorded.	• To use data from a sensor to answer a given question.	Input device Logger Logging Sensor
To explain that a data logger collects 'data points' from sensors over time.	• Recognise that a data logger collects data at given points. This is called a 'data point'. • Identify the intervals used to collect data. • Short intervals are best for fast changes, while long intervals are best for slow changes like the weather.	• To identify how much time has passed between each sample.	Data point Interval Logged
To recognise how a computer can help us analyse data.	• To view data at different levels of detail. • There are different ways to view data.	• To sort data to find information. • Successfully load an existing data file or export a log into a table.	Analyse Dataset Export Import
To identify the data needed to answer questions.	• A data logging plan must run long enough to catch a trend.	• Propose a question that can be answered using a data logger. • Plan how to collect data using a data logger. • Use a data logger to collect data.	Collection Review
To use data from sensors to answer questions.	• Know the benefits of using a data logger. • Reflect on how much harder, slower or less accurate an experiment would be if done by hand.	• Interpret data that has been collected using a data logger. • Draw conclusions from the data. • Present findings to a partner or adult using the data to back up their claims.	Conclusion

Year Four- Photo editing

National Curriculum Statements:
• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable.

Prior Learning:	Future Learning:
• **YEAR 2 – Digital Photography** – Hold a camera still, frame a shot and recognise good light sources. Navigate camera application and open a gallery to save.	• **YEAR 5 – Vector drawing** – Build brand-new illustrations from scratch by combining geometric shapes. Manage complex layers of shapes and bend lines and alter shapes precisely.

Possible misconceptions	Assessment opportunities:
• Misconceptions may arise about what has or has not been edited. Images are not static and what they see online may have, and can be, manipulated using photo editing software. The ethical implications should be questioned, as editing can alter reality or give a misrepresentation of things. • Learners may see photo editing as just a way to make photos look 'prettier'. • Cropping and resizing are the same process. Cropping changes, the image composition by removing parts of it, while resizing changes the image dimensions. • More filters and effects always improve an image; however, overuse can lead to unnatural results. • Saving and exporting are the same actions, however saving refers to keeping the project in a format that can be re-edited, while exporting creates a final image file that is often not easily editable.	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Photo editing			
Enquiry Question: Can we always believe what we see?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
Recognise the possible risks of watching and sharing videos online.	• Popular video-sharing platforms may include content created by people they know and people they do not know. • Not all videos are suitable for all audiences. • Sharing videos online can mean that a much wider audience sees content than originally expected. • People watching a video may not always be who the creator expected or intended. • Some videos may contain inappropriate, upsetting or misleading content. • Personal information can sometimes be revealed through videos, photographs, comments or backgrounds.	• Identify possible risks associated with watching and sharing videos online. • Consider who might view content once it has been shared online. • Evaluate whether a video is appropriate to share publicly or privately. • Identify information that should not be revealed in a video. • Suggest practical strategies for staying safe when watching and sharing videos online. • Discuss how they would respond if they encountered a problem while using a video-sharing platform. • Make responsible decisions about creating and sharing online content.	Appropriate Audience Content Online safety Personal information Privacy Public Report Risk Share Video-sharing platform Viewer

To explain that the composition of digital images can be changed.	• Cropping cuts away the outer edges of a picture to remove unwanted items, change the focal point or reshape the final image. • Rotating turns an image around a fixed central point which can turn a portrait photo into a landscape photo.	• To improve an image by rotating it. • Use photo editing software to crop an image.	Crop Digital Edit Image Rotate Save Undo
To explain that colours can be changed in digital images.	• Different colour effects make you think and feels different things. • Explain why certain colour effects have an effect on someone.	• Experiment with different colour effects.	Adjustments Colours Effects Hue Saturation Sepia Vignette
To explain how cloning can be used in photo editing.	• Cloning tool takes an exact copy of a selected source area and paints it over another area of the same image. • Cloning can add items to a scene or remove unwanted items.	• Add to the composition of an image by cloning. • Remove parts of an image using cloning.	Clone Retouch Zoom
To explain that images can be combined.	• Combine images function by placing elements on top of one another. • Cut out elements from separate files will naturally have different sized and must be resized to fit their new surroundings.	• Experiment with tools to select and copy part of an image. • Use a range of tools to copy between images.	Combine Copy Cut Paste Select
To combine images for a purpose.	• Background and foreground objects must work together harmoniously.	• Choose suitable images for a project. • Create a project that is a combination of other images.	Alter Background Composite Foreground Made up Real
To evaluate how changes can improved an image.	• Review images against a given criteria. • An edit is successful if it directly if it fulfils its intended purpose and looks visually clean, rather than just using as many tools as possible.	• Use feedback to guide making changes. • Combine text and images to complete a project.	Alter Font Image Undo

Year Four- Events and actions in programs

National Curriculum Statements:

- Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.
- Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.
- Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs.
- Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.

Prior Learning:	Future Learning:
• **YEAR 1 – Moving a robot –** A robot only moves when a human inputs instruction through buttons. • **YEAR 2 – Robot algorithms –** Plan a sequence of instructions out loud or on paper before inputting them. • **YEAR 2 – Programming quizzes –** Clicking a specific object on the screen makes something happen. • **YEAR 3 – Prepetition in games –** Use the repeat or forever blocks to create continuous animations.	• **YEAR 5 – Selection in physical computing** – Instead of inputting an instruction, selection forces the computer to constantly check a condition. • **YEAR 6 – Variables in games** – Coding complex interactions between sprites. Changing variables.

Possible misconceptions	Assessment opportunities:
• When developing code for left and right keys, learners need to be aware that Scratch uses x and y coordinates. The stage works as a grid, so x and y coordinate numbers indicate locations on the stage. The x coordinate gives the left-right position, and the y coordinate gives the up-down position. • When introducing the pen extension, 'pen down' may cause confusion. Some may understand this as putting a pen down on the table, instead of putting the pen down, nib first, to draw on the screen. • The pen up block stops the sprite from drawing, and the erase all block removes all lines from the screen. When using the erase all block, learners may not be aware that the sequence of blocks is important. For example, if the 'erase all' block is before the 'go to' block, a line will be drawn when the sprite returns to the start position.	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Events and actions in programs			
Enquiry Question: Can a computer think for itself?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
Understand why games have age ratings and are not suitable for children.	• Video games are given age ratings to help people decide whether content is suitable for a particular age group. • Age ratings are based on the content within a game rather than how difficult the game is to play.	• Identify age ratings on games and explain what they are for. • Evaluate whether a game is appropriate for a particular audience.	Age rating Audience Content Content Descriptor

	• Some games contain violence, frightening scenes, bad language or other content that may not be suitable for children. • Different people may react differently to media content. • Age restrictions exist to help protect children's wellbeing and emotional development.	• Discuss the possible effects of violent or upsetting media content. • Recognise that game content can affect emotions, behaviour and wellbeing. • Justify decisions about whether a game is suitable using evidence from age ratings and content descriptions. • Identify trusted adults who can help with decisions about games and online content. • Make informed choices about games they watch or play.	In-game purchase Online gaming PEGI Risk Suitable Unsuitable Violence Wellbeing
To explain how a sprite moves in an existing project.	• An event is an input or trigger (like pressing a key) that causes an action (like a character moving) to happen in a program. • Blocks of code are read in a sequence from top to bottom, but different sprites run on completely separate scripts.	• Drag, drop and snap blocks together in Scratch to link a keyboard event to a movement block. • Choose which keys to use for actions and explain why it was chosen. • Identify ways to improve a program.	Action Actions Event Motion Sprite
To create a program to move a sprite in four directions.	• A character moves along an invisible grid where changing directions involves changing the face angle. • Sprites must be scaled correctly using percentage sizes so they physically fit within the boundaries of a background layout.	• Edit the size value box of a sprite and use the duplicate tool to quickly copy code scripts across four triggers. • Plan the logical route a sprite must take to move through a path.	Algorithm Logic Move Resize
To adapt a program to a new context.	• Programming toolsets can be expanded with extension blocks to give sprites entirely new capabilities. • Programs need a starting state instruction block so the project resets cleanly every single time the start flag is pressed.	• To use a programming extension. • Consider the real world when design choices. • Choose blocks to set up a program.	Extension block Pen Set up Setup
To develop my program by adding features.	• The colour, thickness and style of a digital pen trail can be altered dynamically by changing values within blocks. • Add features requires assigning memorable control keys so a player can easily interact with the game mechanics.	• Identify additional features from a given set of blocks. • Choose suitable keys to turn on additional features. • Build more sequences of commands to make a design work.	Design Pen up
To identify and fix bugs in a program.	• A bug is an error or mistake in the code sequence that stops the program from running exactly as it is intended to. • Code needs to be systematically tested against a design brief to see it if acts the way it needs to.	• Test a program against a given design. • Match a piece of code to an outcome. • Modify a program using a design.	Errors Debugging Debug

To design and create a maze-based challenge.	• Successful programming includes knowing the task, designing, writing the code and running the game. • A complete game script relies on initialising blocks to ensure a fair restart.	• Make design choices and justify them. • Implement a design. • Evaluate a project.	Code Sprite Test

Year Five- Systems and searching

National Curriculum Statements:
• Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable. • Understand computer networks including the internet; how they can provide multiple services, such as the world wide web. • Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.

Prior Learning:	Future Learning:
• **YEAR 3 – Branching databases** – How to classify, sort and search for data physically and digitally using attributes. • **YEAR 3 – Connecting computers** – Explore how a device takes an input, processes it and produces an output. • **YEAR 4 – The internet** – Physical components of a network and how data travels in packets across the World Wide Web.	• **YEAR 6 – Communication and collaboration** – Develop understanding of the internet, how data is transferred and how the internet facilitates communication and collaboration online.

Possible misconceptions	Assessment opportunities:
• A system is just a single device; it is an interconnected set of components that work together to perform a function. • The internet is a global network of interconnected computers, while the World Wide Web is a collection of information accessed via the internet using web browsers. • Search engines search the entire internet in real-time for their search. This is not the case. Search engines index the internet and retrieve information from their indexed database, they are not searching live. • The first result is always the best, or most relevant, however the first result is based on the search engine's ranking criteria, which may not always align with the user's need. • Using more keywords always leads to better search results. Although using relevant and specific keywords improves search accuracy, overloading with too many keywords can sometimes lead to less relevant results.	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Systems and searching			
Enquiry Question:			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
Understand information about anyone online can be used to make judgments	• People often form opinions about others based on information they find online. • Information online can influence a person's reputation. • Online information may not always give a complete picture of a person. • Photos, comments, videos and posts can be interpreted in different ways by different people. • Online information may be outdated, taken out of context or inaccurate.	• Identify information that may contribute to a person's online reputation. • Discuss how people form opinions based on online information. • Evaluate whether online information presents a complete and accurate picture of someone. • Consider alternative explanations for online content. • Discuss the possible consequences of a positive or negative online reputation.	Assumption Bias Context Digital footprint Fact Judgement Online reputation Opinion Perception Reliable Reputation
To explain that computers can be connected together to form systems.	• A computer system is a collection of connected hardware parts and software applications working together to perform a task. • Connected systems send electronic or wireless signals to share data with other peripheral devices, such as a network server or printer.	• Identify the specific hardware parts of a device. • Explain that computer systems communication with other devices.	Connection Digital Input Output Process Storage System
To recognise the role of computer systems in our lives.	• Many everyday infrastructure tasks are managed by hidden, large-scale computer systems. • Systems are not entirely independent, they require human elements to design, input data, use the system and override errors.	• Explain the benefits of a computer system. • Use online or interactive maps to track how a barcode scanner or smart traffic light passes data through a local system.	Connection Digital Output System
To identify how to use a search engine.	• A search engine is a specialised software tool design to hunt for information across the World Wide Web. • Search engines rely on precise key words to locate data.	• Make use of a web search to find specific information. • To refine a web search. • Compare results from different search engines. • Recognise trustworthy websites.	Refine Search Search engine

To describe how search engines select results.	• Search engines deploy automated software programs called 'web crawlers' or 'spiders' to browse the internet and follow links from page to page. • Web crawlers build a structures library database called an index.	• Recognise the role of web crawlers in creating an index. • Relate a search term to the search engines index. • Explain why we need tools to find things online.	Bot Index Links Selection Web crawler
To explain how search results are ranked.	• Search engines follow mathematical rules and pre-set criteria to display the most useful results first. • Pages that are newer, well-structures and match a searcher's intent are pushed higher up the list.	• To order a list by rank. • Explain that a search engine follows rules to rank results. • Give examples of criteria used by search engines to rank results.	Algorithm Links Ranking
To recognise why the order of results is important and to whom.	• Being at the top of a search result is important at bringing in web traffic. • Search results can be altered or personalised based on a user's location, browsing history or profile. • Sponsored results or advertisements are organisations paying for the search engines to promote their website.	• Describe some of the ways that search results can be influenced. • Recognise some of the limitations of search engines. • Explain how search engines make money.	Content creator Ordering Search engine optimisation (SEO) Selection

Year Five- Video production

National Curriculum Statements:
• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. • Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information. • Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Prior Learning:	Future Learning:
• **YEAR 3 – Stop-frame animation** – a video is a series of individual photographs played in a sequence. Planning a story sequence using a storyboard. • **YEAR 4 – Photo editing** – Crop, rotate and alter images. Compose a visually appealing shot using lighting and framing.	• **YEAR 6 – Webpage creation** – upload and embed media assets into a webpage structure. Engaging a specific target audience. • **YEAR 6 – Audio production** – splitting, trimming and reordering video blocks to manipulate pure audio waves. Manage microphone inputs, audio gain and vocal clarity.

Possible misconceptions	Assessment opportunities:

• Learners may believe that editing is just about cutting out mistakes, however this unit will show that it is a creative process that involves arranging clips, adding effects, transitions, audio and ensuring the video flows coherently. • That pre-production elements (planning, scripting, and storyboarding), are unnecessary, but it is crucial for the structure and vision of the project. • Learners may assume that any footage taken with a camera will look good, but this unit will highlight that good footage requires an understanding of camera angles, framing, lighting and steady camera movements. • When editing, they may assume that must edit the film in the order it was shot, however this process does not have to be linear, and reshooting can take place at any point. They may assume that adding lots of special effects will automatically make a video better, however overusing these can make a video look cluttered and distract from the content.	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Video production			
Enquiry Question: How can a camera tell a story?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To understand the risks and involved in livestreaming and staying safe creating live content.	• Livestreaming allows people to broadcast video and audio to an audience in real time. • Livestreams can be viewed by friends, followers, strangers or the general public depending on platform settings. • Once information is shared during a livestream, it can be difficult to take back or remove completely. • Personal information can be revealed accidentally during a livestream through speech, images, backgrounds or location clues. • Livestreaming platforms often include features such as comments, chat functions and audience interaction. • Some viewers may record or screenshot livestream content.	• Identify risks associated with livestreaming. • Evaluate whether a livestreaming situation is safe or unsafe. • Identify personal information that should not be shared during a livestream. • Suggest strategies for staying safe while livestreaming. • Make informed decisions about whether content should be streamed publicly, privately or not at all. • Apply online safety knowledge to livestreaming scenarios.	Audience Broadcast Chat Livestream Privacy Private Risk Screenshot Streamer Viewer
To explain what makes a video effective.	• Video is a visual media format created by compiling a fast sequence of photographs. • Effective video clips rely on specific choices like framing, steady tracking, audio and pacing.	• Open, pause, skip and navigate a digital media player to identify production elements. • Compare features in different videos.	Angle Audio Camera Close up Long shot Microphone Mid-range

			Moving subject Talking head Video
Use a digital device to record video.	• Different shot lengths are chosen to convey emotion or reveal context. • Altering the angle of a camera lens shifts the audience's perspective of a subject.	• Identify and find features on a digital video recording device. • Experiment with different camera angles. • Make use of a microphone.	Camera Close up Filming Lens Long shot Microphone Mid-range Moving subject Static Video camera
Capture video using a range of techniques.	• A storyboard is used by content creators to visually map out individual scenes before filming begins. • Each frame layout must account for the physical shot type, actor positioning and matching the audio to script.	• Suggest filming techniques for a given purpose. • Capture video using a range of filming techniques. • Review how effective a video is.	Angle Close up Filming Long shot Mid-range Moving object Pan Panning Static Storyboard Tilt Zoom
To create a storyboard.	• When recording files across shared hardware, content must be saved carefully to prevent overwriting or deleting another user's work. • Successful videography requires managing background noise, using microphones and ensuring consistent lighting.	• Outline the scenes of a video. • Decide which filming techniques to use. • Create and save video content.	Angle Clip Close up Filming Long shot Mid-range Sequence Storyboard Talking head
To identify that video can be improved through reshooting and editing.	• Digital video files must be imported from a hardware recording device's internal storage space into a folder. • A video editor timeline allows clips to be trimmed, split, reordered or deleted.	• Store, retrieve and export a recording to a computer. • Explain how to improve a video by reshooting and editing. • Select the correct tools to make edits to a video.	Clip Delete Edit Import Reorder Reshoot

			Review Split Trim
To consider the impact of the choices made when making and sharing a video.	• Reviewing digital media relies of comparing the final outcome to the planned storyboard.	• Make edits to a video and improve the final outcome. • Recognise that choices made when making a video will impact the quality of the final outcome. • Evaluate a video and share opinions about it.	Audience Audio Edit Evaluate Export Review Share Video

Year Five- Selection in physical computing

National Curriculum Statements:
• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • Use sequence, selection and repetition in programs; work with variables and various forms of input and output. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. • Select, use and combine a variety of software on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.

Prior Learning:	Future Learning:
• **YEAR 1 – Moving a robot** – A robot is a machine that executes a sequence of commands typed into it by a human. • **YEAR 4 – Repetition in games** – Learn the difference between an infinite loop and a count-controlled loop to make characters move on a screen. • **YEAR 4 – Events and actions in programs** – Pressing a key on a keyboard triggers an action on the screen.	• **YEAR 5 – Selection in quizzes** – Use selection logic to handle abstract digital data. • **YEAR 6 – Variables in games** – Monitor changing numerical data.

Possible misconceptions	Assessment opportunities:
• The battery power is always flowing to the board; the code simply opens and closes digital gates on the individual output pins. • LEDs will only light up if the positive and negative clips match the correct longer and shorter legs of the component. • Computers need explicit instructions for every state change.	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Selection in physical computing			
Enquiry Question: How do machines make decisions?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To explain how using technology can be a distraction from other things, in both a positive and negative way.	• Technology can sometimes help people focus, learn, organise tasks and communicate more effectively. • Different people may be affected differently by technology use. • Notifications, games, videos and social media can interrupt concentration. • Using technology for long periods without breaks can affect wellbeing. • Maintaining a healthy balance between online and offline activities is important. • Technology itself is not inherently good or bad; the impact often depends on how, when and why it is used.	• Identify examples of positive and negative distractions caused by technology. • Explain how technology can support learning, communication or wellbeing but can also interrupt concentration or prevent people from completing important tasks. • Discuss how technology use may affect different areas of life, such as school, hobbies, friendships and sleep. • Reflect on their own technology habits and identify areas for improvement. • Suggest strategies to reduce unwanted distractions from technology. • Compare the benefits and drawbacks of different forms of technology use. • Make informed decisions about balancing online and offline activities. • Justify opinions using examples from real-life situations.	Balance Distraction Healthy habit Negative Notification Offline Online Positive Productivity Social media Technology Wellbeing
To control a simple circuit connected to a computer.	• Physical computing involves connecting software code on a computer to real-world hardware component through an interface board. • An electrical circuit must form a complete, continuous loop from a power source, through components like a bulb and back to a ground connection to function.	• Create a simple circuit and connect it to a microcontroller. • Program a microcontroller to make an LED switch on. • Explain what an infinite loop does.	Battery box Buzzer Cell Circuit Components Connect Connection Crocodile clips Crumble controller LED Microcontroller Motor Output Power USB

To write a program that includes count-controlled loops	• A loop is a programming control that repeats a set block of instructions to make code shorter, cleaner and more efficient. • A count-controlled loop executes its actions a precise, predetermined number of times before stopping.	• Connect more than one output component to a microcontroller. • Use a count-controlled loop to control outputs. • Design sequences that use count-controlled loops.	Action Buzzer Count-controlled loop LED Program Repetition Sparkle
To explain that a loop can stop when a condition is met.	• A condition-controlled loop keeps repeating instructions based on an ongoing rate rather than a static count. • A condition is a true/false statement that breaks a loop cycle instantly when its state changes.	• I can explain that a condition is either true or false. • Design a conditional loop. • Program a microcontroller to respond to an input.	Action Condition Motor Sparkle
To explain that a loop can be used to repeatedly check whether a condition has been met.	• To capture real-world changes instantly a program must use an infinite loop to force the computer to evaluate a condition millions of times per second. • Component inputs like light sensors, push buttons or tilt switches, feed digital data back into the system.	• Explain that a condition being met can start an action. • Identify a condition and an action in a project. • Use selection ('if', 'then' statements) to direct the flow of a program.	Crumble controller Infinite loop Input Output Program Selection Switch
To design a physical project that includes selection.	• Successful physical computing projects require a balanced design layout that accounts for both physical building materials and software logic constraints. • Mapping out a system before building ensures that inputs and outputs respond correctly.	• Identify real world examples of a condition starting an action. • Describe what a project will do. • Create a detailed drawing of a project.	Battery box Components Input Microcontroller Output component Selection
To create a program that controls a physical computing project.	• A finalised automated product depends entirely on code logic coordinating perfectly with stable, physical components. • When an automated system fails, a programmer must diagnose whether the issue is an error in the software blocks or a mechanical fault in the wiring.	• Write an algorithm that describes what the model will do. • Use selection to produce an intended outcome. • Test and debug a project.	Cell Circuit Crocodile clips Debug Power Switch USB

Year Five- Flat-file databases

National Curriculum Statements:

- Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.
- Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information.

Prior Learning:	Future Learning:
• **YEAR 1 – Grouping data** – Data is physically sorted by sorting coloured blocks, toys or grouping items on a table based on simple, shared properties. • **YEAR 2 – Pictograms** – Collect local data and input it into basic software to create a digital pictogram. • **YEAR 3 – Branching databases** – classify and sort physical objects by asking a sequence of closed yes/no questions. • **YEAR 4 – Data logging** – Connecting physical sensors to a system that records data points over a long period.	• **YEAR 6 – Introduction to spreadsheets** – Data inside a cell can be dynamically manipulated using formulas and functions. • **YEAR 6 – Variables in games** – Understand variables in scratch.

Possible misconceptions	Assessment opportunities:
• Assuming that data and information are the same thing. Data is raw unprocessed facts and figures without any context, typically a collection of letters, words, numbers, dates, images, etc. Information is data that has been processed, organised or structured to provide context and meaning- it helps to make sense of the data. For example, '1' is data, but '1' in a list of race positions is information as it tells us the person came first. • Thinking that a flat-file database is just a simple list or table of data. A flat-file database is a single table that stores data in a structured format, allowing for efficient data organisation, retrieval or management. • Mistaking records for fields, or vice versa. They should understand that fields are the specific categories of information (the columns in a table with headings for each category) and records are the complete set of information for each entry in the database (the row in a table, each representing a complete set of related information). • Searching is the same as searching through a text file, however it can be far more efficient than manual searches using different search functions ('AND' and 'OR'). Again, learners may confuse these two search functions; simply, 'AND' will search for records that meet **all** the criteria, whereas 'OR' will search for records that meet **any** of the criteria.	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Flat-file databases			
Enquiry Question: How can a computer replace a filing cabinet?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To explain how information shared online can affect privacy.	• Information can be shared online both intentionally and unintentionally. • Websites and apps may collect information about users and their online activity. • Online services use collected information in different ways, including personalising content and advertising. • Advertisers may use information about users to target specific adverts. • Privacy settings allow users to control what information is shared and who can see it. • Digital footprints are influenced not only by posts and comments but also by information collected automatically through online services.	• Explain how websites and apps may collect information about users. • Analyse different ways personal information can be shared online. • Evaluate whether a website or app collects information responsibly. • Identify privacy features and settings that help protect information. • Make informed decisions about what they share online. • Reflect on how their online behaviour contributes to their digital footprint.	Advertiser Cookie Data Digital footprint Online tracking Opt out Personal Information Privacy Privacy policy Privacy settings Targeted advertising Terms of service
To use a form to record information.	• Data is raw text or numbers without context. • Information is data that has been organized meaning. • An object has descriptive categories called attributes and specific entries called values. • A flat-file database organises structured data into individual items called records within a single uniform table.	• Create a database using cards. • Explain how information can be recorded. • Order, sort and group data cards.	Data Database Field Information Record Value
To compare paper and computer-based databases.	• Digital databases present data in a record view or table view. • Digital tools outperform physical sorting because they allow data to be added, edited and accessed instantly without errors.	• Explain what a field and a record is in a database. • Navigate a flat-file database to compare different views of information. • Choose which field to sort data by to answer a given question.	Compare Data Database Information Value
To outline how to answer questions by grouping and sorting data.	• Combine different records into sets based on shared field similarities or values. • Organising a single column of records into an alphabetical or numerical sequence.	• Explain that data can be grouped using chosen values. • Group information using a database. • Combine grouping and sorting to answer specific questions.	Group Order Sort
Explain that tools can be used to select specific data.	• Search tools isolate specific fields by looking for an exact value match to strip out unneeded data. • Advanced searches use ‘and’ and ‘or’ to filter files accurately.	• Choose which field and value are required to answer a given question. • I can outline how ‘and’ and ‘or’ can be used to refine data selection.	Criteria Database Filter Search

		• Choose multiple criteria to answer a given question.	Value
Explain that computer programs can be used to compare data visually.	• Converting data records into visual charts makes it vastly easier for humans to spot patterns, trends and anomalies. • Creating charts requires mapping text fields to an X-axis and numerical counts or values to a Y-axis.	• Select an appropriate chart to visually compare data. • Refine a chart by selecting a particular filter. • Explain the benefits of using a computer to create charts.	Axis Chart Compare Graph
Use a real-world database to answer questions.	• Real institutions rely entirely on flat-file structures to operate. • Public search tools disguise structural databases beneath booking fields and dropdown filters.	• Ask questions that will need more than one field to answer. • Refine a search in a real-world context. • Present findings to a group.	Criteria Database Filter Presentation

Year Five- Vector graphics

National Curriculum Statements:
• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.

Prior Learning:	Future Learning:
• **YEAR 1 – Digital painting – C**licking and dragging leaves a trail of coloured pixels on a flat canvas. If a mistake is made, the undo or erase button can remove it. • **YEAR 3 – Desktop publishing – Cl**icking, resizing and dragging text boxes and images around a page. Images and text can clip and overlap.	• **YEAR 6 – Web page creation –** Exporting vector illustrations as web-friendly file formats and embed them into a webpage header or gallery.

Possible misconceptions	Assessment opportunities:
• Every shape is a floating, independent mathematical object. They will frequently try to erase mistakes with a brush or selection marquee rather than simply clicking the specific shape object and hitting the delete key. • Because vectors are made of mathematical formulas rather than static pixels, the computer recalculates the lines instantly, keeping the edges razor-sharp at any size.	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Vector graphics			
Enquiry Question: How can digital shapes be combined to create purposeful artwork?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To assess and justify when it is acceptable to use the work of others.	• Not all content found online can be used freely. • The creator or owner of a piece of work has rights over how it is used. • Permission may sometimes be given through licences, copyright-free resources or specific terms of use. • There are situations where using another person's work may be acceptable if the creator's conditions are followed. • Giving credit to a creator does not automatically mean content can be used without permission. • Using another person's work without permission can have consequences for both the creator and the user.	• Assess whether a piece of digital content can be used in a specific situation. • Identify situations where content can be reused legally and ethically. • Consider the conditions attached to digital content before using it. • Explain why crediting a creator may not always be enough permission. • Evaluate sources of digital content for suitability and permissions. • Justify decisions using evidence about ownership, permissions and intended use.	Attribution Copyright Copyright-free Creator Ethical Intellectual Property Licence Ownership Permission Public domain Reuse Terms of use
To identify that drawing tools can be used to produce different outcomes.	• A vector drawing is a digital image made entirely from mathematically defined lines and 2D shapes, rather than rows of tiny square pixels. • Vector drawings ca be scaled up or down infinitely without ever losing their quality or getting blurry.	• Experiment with selecting, drawing, changing line weights, and applying fill colours to individual shapes. • Compare digital vector drawings against traditional paper drawings.	Drawing tools Toolbar Vector Vector drawing
To create a vector drawing by combining shapes.	• Every line, circle or polygon added to a canvas is treated by the computer as a standalone, independent object. • Complex real-world objects can be broken down into a layout of simple geometric blocks.	• Click, drag, resize, rotate and duplicate matching geometric shapes to construct a composite vector illustration.	Move Object Resize Rotate Select
To use tools to achieve a desired effect.	• Advanced software features like alignment guides and snapping grids assist designers in sizing and placing objects relative to each other. • The zoom tool changes the display perspective of the canvas without altering the dimensions of the objects.	• Zoom in to edit intricate boundaries accurately and centre shapes. • Determine when to use a specific tool to fit a design requirement. • Explain how alignment girds and resize handles can be used to improve consistency.	Align Colour Modify Select Zoom
To recognise that vector drawings, consist of layers.	• Vector graphics use a vertical stacking order where every single object sits on its own invisible layer. • Overlapping shapes simulate depth; an object at the top of the stack covers objects below it.	• Change the order of layers in a vector drawing. • Use layering to create an image. • Use menu functions such as ‘bring forwards’, ‘send backwards’, ‘send to back’ and ‘bring to front’.	Layers Order

To group objects to make them easier to work with.	• Grouping links distinct objects together so the computer can treat them as a single collective item. • Grouped objects are not permanently fused, they can be ungrouped at any time to edit the smaller properties inside.	• Copy part of a drawing by duplicating several objects. • Recognise when objects need to be grouped or ungrouped. • Reuse a group of objects to further develop a vector drawing.	Copy Duplicate Group Move Paste Resize Reuse Ungroup
To apply what I have learned about vector drawing.	• Creating a final illustration relies on combining, planning, layering, grouping and colouring to meet a goal. • Assessing digital art involves comparing the final canvas layout directly back against the original design checklist to identify errors.	• Create a vector drawing for a specific purpose. • Reflect on the skills used and why they have been used. • Compare vector drawings to freehand paint drawings.	Reflection

Year Five- Selection in quizzes

National Curriculum Statements:
• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.

Prior Learning:	Future Learning:
• **YEAR 3 – Repetition in shapes –** Use a count-controlled loop to draw geometric patterns. • **YEAR 3 – Repetition in games –** An interactive game needs to run constantly using a forever loop. • **YEAR 4 – Sequencing sounds – S**equencing means executing instructions in a direct order. • **YEAR 4 – Events and actions in programs –** External triggers to start a script are called 'events'.	• **YEAR 6 – Variables in games –** A data variable can be the condition that selection tests for. • **YEAR 6 – Sensing movement –** Manage multiple selection paths simultaneously.

Possible misconceptions	Assessment opportunities:

• Once the 'if…then…else' block is used, the computer will actively watch that block and wait for it to happen forever. • A computer evaluates code in a fast, linear sequence. When the program runs, it hits the 'if' statement, checks it once, finds it false, and immediately skips past it. • Conditions need to be wrapped inside a forever loop. The loop forces the computer to continuously re-read and check the condition.	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Selection in quizzes			
Enquiry Question: Can we use computer logic to answer real-world questions?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To understand how to use AI safely and responsibly.	• AI learns from large amounts of data and identifies patterns to help make decisions. • The more relevant data an AI system receives, the better it may become at performing its task. • AI is not always correct and can make mistakes. • AI-generated responses should be checked rather than accepted automatically. • People remain responsible for decisions made when using AI tools. • AI should be used safely, responsibly and critically.	• Explain how AI learns from data. • Describe some benefits of AI technologies. • Describe some limitations of AI technologies. • Question whether AI-generated information is accurate. • Evaluate when AI might be helpful and when caution is needed. • Make informed decisions about using AI safely and responsibly. • Explain why critical thinking is important when using AI tools.	Accuracy Algorithm Chatbot Critical thinking Data Decision Input Machine learning Output Pattern Reliability
To explain how selection is used in computer programs	• Selection is the programming concept where a computer system evaluates a specific true/false statement to choose which pathway of code to execute next. • A condition is a statement or test that results in a definitive choice.	• To recall how conditions are used in selection. • Identify conditions in a program. • Modify a condition in a program.	Condition False Program Selection True
To relate that a conditional statement connects a condition to an outcome	• A basic conditional statement links a single true condition directly to a specific action outcome. • Computer logic operates exactly like a real-world conditional decision.	• Use selection in an infinite loop to check a condition. • Identify the condition and outcomes in an 'if'… then… else…' statement. • Create a program that uses selection to produce different outcomes.	Condition Conditional statement Count-controlled loop Outcomes
To explain how selection directs the flow of a program	• Code does not always run in a straight, linear sequence. Selection causes the program's path to branch in separate directions. • An 'if…then…else' block splits the program flow in exactly two ways, one if the code is true and one if the code is not.	• Explain that program flow can branch according to a condition. • Design the flow of a program that contains 'if…then…else…' • Show that a condition can direct program flow in one of two ways.	False Operator Outcomes Selection True

To design a program that uses selection.	• Programs use the 'ask' block to collect a string of text from a user and temporarily story it inside an 'answer' block. • Before typing or assembling code blocks, programmers must plan out the questions, conditions, and branching pathways using pseudo-code or flow diagrams.	• Outline a given task. • Use a design format to outline a project. • Identify the outcome of user input in an algorithm.	Algorithm Design Input Question Task
To create a program that uses selection	• Translating a paper design into working code requires precise block placement, operator matching and variable tracking. • Programs must be checked multiple times by entering both correct and incorrect values to confirm that both branches of code work.	• Implement an algorithm to create the first section of a program. • Test a program. • Share a program with others and receive feedback.	Answer Debug Implement Run Test
To evaluate a program	• Programs need clear initialisation scripts to ensure it behaves consistently each time is it run. • Evaluation requires comparing the operational code back against the design brief to measure its success.	• Identify the ways a program can be improved. • Identify the setup code needed in a program. • Extend a program further.	Debug Design Setup Test

Year Six- Communication and collaboration

National Curriculum Statements:
• Understand computer networks, including the internet; how they can provide multiple services, such as the World Wide Web, and the opportunities they offer for communication and collaboration. • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information. • Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Prior Learning:	Future Learning:
• **YEAR 3 – Connecting computers –** Learn the different between digital and non-digital devices. • **YEAR 4 – The internet –** The internet is a network of networks and the WWW is just one software application running on top of that physical hardware. • **YEAR 5 – Sharing information –** How search engines find information and how web systems rank results.	• **YEAR 7 – Networks from semaphores to the internet -** Addressing the benefits of networking and covering how data is transmitted across networks using protocols.

Possible misconceptions	Assessment opportunities:

• Within this unit, pupils work on shared projects, collaborating via the internet. Because pupils are likely in the same room, though not working on the same device, this can create a misconception that to work collaboratively over the internet you still need to be physically close. They can only communicate over the internet because this way of working together works if you are next to each other, or if you are hundreds of miles apart.	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Communication and collaboration			
Enquiry Question: How do computers deliver messages?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To explain how online conflict can escalate and identify strategies to de-escalate drama.	• Digital drama is conflict, disagreement, gossip or arguments that take place using digital technology. • Online conflicts can escalate more quickly than face-to-face disagreements because messages can be shared instantly with large audiences. • Online disagreements can affect both the people directly involved and those who witness them. • People may react differently online because they do not see facial expressions, body language or tone of voice. • Online drama can have emotional consequences, including embarrassment, anxiety, anger or damaged friendships. There are strategies that can help de-escalate conflict and prevent situations from becoming more serious. • Responsible digital citizens think before they post and consider the impact their actions may have on others.	• Identify examples of digital drama. • Analyse how different actions may contribute to or reduce conflict. • Consider situations from multiple perspectives. • Evaluate the possible consequences of online actions. • Suggest strategies for de-escalating digital drama. • Reflect on how digital drama can affect individuals, friendships and communities. • Justify appropriate responses to challenging online situations.	Audience Conflict Consequence De-escalate Digital drama Escalate Influence Online behaviour Perspective Reputation Resolve
To explain the importance of internet addresses.	• Every device connected to the internet has a unique numerical internet protocol (IP) address. • The Domain Name System (DNS) acts like a phone book, translating human-friendly web addresses into numerical IP addresses that computers understand.	• Explain that internet devices have addresses. • Describe how computers use addresses to access websites.	Address Domain Name Server (DNS) Internet Internet Protocol (IP) Private Public
To recognise how data is transferred across the internet.	• Files, images and messages do not travel whole; they are broken down into tiny, numbered pieces called packets. • Packets take different paths across networks to reach their destination efficiently and safely.	• Identify and explain the main parts of a data packet. • Explain that data is transferred over networks in packets. • Explain that all data transferred over the internet is in packets.	Data Data payload Header Packet Protocol

To explain how sharing information online can help people work together.	• Files can be stored on remote internet server (the cloud) rather than locally on a single machine. • Cloud platforms allow multiple users to edit, and contribute to the same document in real time from anywhere in the world.	• Recognise how to access shared files stored online. • Send information over the internet in different ways. • Explain that the internet allows different media to be shared.	Collaboration Data Explore Internet
To evaluate different way of working together online.	• Different collaborative tasks require different cloud tools i.e., shares presentations, spreadsheets or forms. • Cloud tools save revisions automatically, protecting work from accidental deletion by team members.	• Identify different ways of working together online • Recognise that working together on the internet can be public or private. • Explain how the internet enables effective collaboration.	Collaboration Remix Reuse Slide deck
To recognise how we communicate using technology.	• Live, real-time messaging where responses happen instantly. • Delayed messaging is where responses happen later.	• Identify there are a variety of ways to communicate over the internet. • Choose methods of communication to suit particular purposes.	Chat Communication One-way Two-way
To evaluate different methods of online communication.	• Different communication tools suit different contexts. • Online communication spaces require strict e-safety protocols to protect privacy and mental-health.	• Compare different methods of communicating on the internet. • Decide when information should and should not be shared online. • Explain that communication on the internet may not be private. • Explain how to report inappropriate content online.	Communication One-to-many One-to-one Protocol

Year Six- Variables in games

National Curriculum Statements:
• Design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.

Prior Learning:	Future Learning:

• **YEAR 3 – Repetition in shapes –** Use count-controlled loops to draw geometric shapes. • **YEAR 3 – Repetition in games –** Use infinite loops to keep a game background moving. • **YEAR 4 – Sequencing sounds –** Code must follow a sequence so musical notes play in the correct and predictable sequence. • **YEAR 4 – Events and actions in programs –** An event triggers an immediate action on the screen. • **YEAR 5 – Selection in physical computing –** Use sensors to trigger external hardware. • **YEAR 5 – Selection in quizzes -** Use selection blocks to guide a program down a different path.	• **YEAR 6 – Sensing movement –** Program external hardware to track data, such as a micro:bit step counter that adds a variable every time it detects movement.

Possible misconceptions	Assessment opportunities:
• A variable holds a piece of data, it can only hold one piece of data at once and this can change throughout the program. • The analogy of a small box is often used to help pupils understand variables – the box can hold a piece of data, but because it is small, we have to get rid of the last piece of data to put a new one in. The box can only hold one piece of data. We can replace it, but it can only ever fit one piece of data in. Sticky notes are also used in the unit to demonstrate this. • Score is often used to introduce variables, and is used in this unit. This is because score is a familiar variable that pupils have likely experienced before. However, it is important to emphasise that score is one example of a variable, but that not all variables are 'score'.	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Variables in games			
Enquiry Question: How do games keep tracks of our choices, whilst we play?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To demonstrate how to make responsible choices about my online identify.	• Digital consent means giving or receiving permission before sharing information, images, videos or other digital content involving another person. • Consent is relevant in both online and offline situations. • People may choose to give or refuse consent depending on the situation. • Digital content can be copied, saved and shared further once it has been posted online.	• Identify situations where consent should be requested before sharing content. • Evaluate whether sharing digital content is appropriate. • Explain the possible consequences of sharing information without consent. • Justify decisions about when consent is needed.	Consent Digital consent Digital content Online identity Permission Post Privacy Private information Reputation

	• Online services may request consent through terms, conditions and permissions.	• Apply digital consent principles to real-life online situations.	Rights Share Terms and conditions
To define a variable as something that is changeable	• A variable is a named space or container in a computer's memory that stores information that can vary or change while a program is running. • Variables can hold different types of data values, including numbers or letters. • Real-world games rely on variables to track volatile elements, such as the countdown timer or goal tally in a football match.	• Identify examples of information that is variable. • Look at a game and accurately categorize which information is completely fixed and which is variable.	Change Program Task Variable
To explain why a variable is used in a program	• A basic variable function as a placeholder memory cell that can only hold a single value at any given moment. • Programmers must give variables clear and descriptive names so the program logic can find and track them easily.	• Use Scratch to manually create, name and display a new functional variable block. • Complete a data-tracking sequence to model how a variable update and replaces its memory.	Assign Declare Name Set Value
To choose how to improve a game by using variables	• The specific slot where a 'change variable' block is dropped in a script dictates exactly how and when a score increases or decreases. • Game variables require specific script triggers to alter their value.	• Program an existing game to update its scoreboard dynamically by adding a 'change score' block inside an interaction script. • Predict the outcome of moving a data change block to different sections of an event loop.	Code Event Improve
To design a project that builds on a given example	• Before building a game, designers must step back from coding to map out the visual elements and operational rules separately. • Designing variable-controlled games requires writing clear algorithms that detail how data variable interact with game rules.	• Sketch out a clear storyboard layout mapping game glow, user targets and scoring. • Plan how variables will track goals or limits within the project.	Algorithm Artwork Design Project
To use a design to create a project	• A program needs an explicit reset script running form the start. • Turning an algorithm into functional blocks requires translating written layout concepts.	• Make a functional multi-sprite game matching your initial storyboard structure. • Check the software to find and debug errors.	Code Debug Test
To evaluate a project	• Software evaluation means comparing the final running product back to the original plan. • Sharing code with others provides feedback.	• Export or share the operational game file to a class studio. • Suggest functional upgrades or advances ways to expand the game.	Evaluate Share

Year Six- Web page creation

National Curriculum Statements:
• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. • Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information. • Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour.

Prior Learning:	Future Learning:
• **YEAR 1 – Digital writing –** Use a keyboard to type sentences, change font types, use bold text and save documents. • **YEAR 1 – Digital painting –** Use paint programs to choose colour palettes, use fill tools and create custom digital pictures from scratch. • **YEAR 3 – Desktop publishing –** Manipulate text boxes, insert images and understand how a person's eye moves across a physical page layout. • **YEAR 4 – Photo editing –** Crop images, change brightness, apply filters and combine multiple photos into a composite image. • **YEAR 5 – Vector drawing –** Combine shapes, adjust line thicknesses and layer objects to create digital logos and icons.	• **YEAR 7 – Gaining support for a cause –** Create a blog post about a real world cause they are passionate about. • **YEAR 7 – Clear messaging in digital media –** Work between different applications to create a poster and slides on a given theme.

Possible misconceptions	Assessment opportunities:
• In this unit, pupils use a website builder to create their websites, for example Google sites, which means no coding is needed. This is because the knowledge and skills being taught are related to hyperlinking and website design, rather than to programming in a complex text-based language. Whilst not a misconception, some pupils will be expecting to use 'code' to build their website. It is important to address that whilst some websites are built this way, more and more are now build using website builders such as Google Sites where users instead drag and drop pre-coded elements into their website. This means that making websites is much easier than it once was, but can limit the functionality of the website.	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Web page creation			
Enquiry Question: How do web designers guide us through the internet?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**

To identify whether a news source is credible and trustworthy.	• Some information online may be false, misleading, exaggerated or designed to influence people's opinions. • Credible information is information that can be trusted because it is accurate, reliable and supported by evidence. • Credible news sources usually provide evidence, clear authorship and information that can be checked against other sources. • News articles, websites and social media posts should not always be accepted at face value. • Comparing information across multiple sources can help determine reliability. • Misinformation can spread quickly online and influence people's beliefs and decisions.	• Evaluate information found online for accuracy and reliability. • Question the purpose of a news article or website. • Check whether claims are supported by evidence. • Compare information from multiple sources. • Justify whether a source should be trusted. • Apply critical thinking when reading news and online content.	Bias Credible Critical thinking Evidence Fake news Hoax Misinformation Reliable Source Trustworthy Verify
To review an existing website and consider its structure	• A website is a collection of interconnected web pages hosted on a web server under a single domain name. • The homepage acts as the main entry hub, serving as the starting point for visitors to access all other sub-pages. • Sites are designed with targeted audiences and specific goals in mind, which dictates how information in laid out.	• Explore a website. • Discuss the different types of media used on websites.	Browser Hypertext mark-up language (HTML) Media Purpose Web page Website
To plan the features of a webpage	• Web pages rely on a deliberate mix of visuals, text and interactive assets to make information engaging. • A good design grid keeps pages organised so users can easily read and scan the information.	• Recognise the common features of a web page. • Suggest media to include on a page. • Draw a web page layout that suits a purpose.	Header Home page Layout Logo
To consider the ownership and use of images (copyright)	• Most online media assets belong to the person who made them and are protected by copyright rules. • Creators must use creative commons or public domain markers to let others borrow their work safely. • If using a permitted image, we must add a text tag giving credit to the original creator.	• Explain why copyright-free images should only be used. • Find copyright-free images. • Use technology safely and responsibly when online.	Copyright Fair use Media
To recognise the need to review pages	• Web designers must constantly test their pages to fix errors, spelling mistakes or layout bugs before allowing the public access.	• Add content to a web page. • Preview what the web page will look like. • Evaluate and suggest/make edits to a web page.	Device Evaluate Google sites Preview
To outline the need for a navigation path	• A hyperlink is a digital link that connects one web page to another when clicked. • Web pages need clear navigation menus or pathways so users can easily find information without getting lost or stuck on one page.	• Make multiple web pages and link them using hyperlinks.	Breadcrumb trail Hyperlink Navigation Subpage

To recognise the implications of linking to content owned by other people	• An external link takes a visitor away from the webpage to a page run by someone else. • External sites can change or vanish without warning, turning hyperlinks into dead links.	• Create hyperlinks to link to another person's work. • Evaluate the user experience of a website.	Embed Evaluate External link Implication

Year Six- Introduction to spreadsheets

National Curriculum Statements:
• Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information.

Prior Learning:	Future Learning:
• **YEAR 4 – Data logging –** Connect physical external sensors to a computer so the data logger can record shifting values automatically. • **YEAR 5 – Branching database –** Group a fixed set of objects by looking for their physical traits.	• **YEAR 7 – Modelling data using spreadsheets –** Analysing large, real-world data sets.

Possible misconceptions	Assessment opportunities:
• The misconceptions when pupils are first introduced to spreadsheets often come from their expected use of certain symbols from mathematics. For example, pupils can often find the change from using x to * for multiply confusing. It can help to explain that as a person, they know that x can be a letter or a multiply, but a spreadsheet can't know it as two things. Because of this, a spreadsheet only knows it as a letter and another symbol had to be chosen as multiply. • Pupils may find using the = symbol at the start of the cell confusing as they are more likely to see it after a calculation. For example, if they want a cell to show the results of adding A1 and B1 together, it may feel more natural to write A1 + B1 =. Calculations in maths can be written either way - 6 = 2 + 4 is the same as 2 + 4 = 6. A spreadsheet only knows it is being asked to do maths (calculate a formula) if the equals is at the start.	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Introduction to spreadsheets			
Enquiry Question: How can spreadsheets help plan mathematical, real-life situations?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To explain why plagiarism is wrong and how to use information from online sources responsibly.	• Plagiarism is taking someone else's work or ideas and presenting them as your own. • Plagiarism can involve copying text, images, videos, music, designs or ideas from online and offline sources. • Schools, colleges and universities take plagiarism seriously. Technology can be used to detect copied work. • Information from sources can be used responsibly by putting ideas into your own words and acknowledging where information came from. • Copyright, ownership and plagiarism are related but different concepts.	• Define plagiarism and identify examples of it. • Distinguish between original work and copied work. • Evaluate whether information has been used responsibly. • Rewrite information using their own words rather than copying directly. • Justify why creators should receive credit for their work. • Make ethical decisions when completing research or digital projects. • Apply copyright and ownership principles when creating their own work.	Attribution Copyright Creator Credit Ethical Original work Ownership Paraphrase Plagiarism Quote Reference Research Source
To create a data set in a spreadsheet	• A data set is an organised collection of related information that can be modified, sorted and filtered using a computer. • Spreadsheets arrange data into vertical columns and horizontal rows. • Data headings are critical labels at the top of columns to tell the user and the computer exactly what kind of data is stored underneath them.	• Collect data. • Enter data into a spreadsheet. • Suggest how to structure data.	Collecting Data Data set Organised Structure Table
To build a data set in a spreadsheet	• A cell reference is a unique alphanumeric code made up of the column letter followed by the row number (e.g., `C4`) that specifies an exact grid location. • An item of data is a single piece of information sitting inside an individual active cell. • Number formatting changes how the computer reads and interacts with data items (e.g., setting a cell to Currency £, Percentage %, or Date), which is completely different from style formatting like fonts or colours.	• Choose an appropriate format for a cell. • Apply an appropriate format to a cell.	Cell Cell reference Data item Format Spreadsheet
To explain that formulas can be used to produce calculated data	• A spreadsheet only knows it is being asked to perform a calculation if the formula starts with an equal's sign. • Formulas use cell references rather than fixed numbers, allowing calculations to update automatically if the original input data changes. • The computer can only run mathematical equations on number data types.	• Construct a formula in a spreadsheet. • Explain which data types can be used in calculations.	Calculation Formula Input Output

To apply formulas to data	• Spreadsheets use specific digital symbols for calculations like an asterisk for multiplication and a forward slash for division. • A colon symbol is used to define a range of cells spanning across a row or column. • Rather than writing out the same formula dozens of times, programmers use features like autofill to clone a formula down an entire column instantly.	• Calculate data using different operations. • Create a formula which includes a range of cells. • Apply a formula to multiple cells by duplicating it.	Duplicate Operation Range Sigma Sum
To create a spreadsheet to plan an event	• Spreadsheets allow people to run hypothetical scenarios to budget costs and model real-world events safely before spending money. • Using structured item catalogues allows an event planner to pick, choose, and calculate budget totals cleanly.	• Use a spreadsheet to answer questions. • Explain why data should be organised. • Apply a formula to calculate the data I need to answer questions.	Project Propose Question Tools
To choose suitable ways to present data	• Presenting dense rows of numbers as a chart or graph makes patterns, spikes, and anomalies instantly visible. • Different styles of charts communicate different stories (e.g., a bar chart shows distinct comparisons, while a line graph displays changes over time).	• Produce a chart. • Use a chart to show the answer to a question. • Suggest when to use a table or a chart.	Chart Comparison Evaluate Results

Year Six- Audio production

National Curriculum Statements:
• Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content. • Select, use, and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems, and content that accomplish given goals, including collecting, analysing, evaluating, and presenting data and information. • Use technology safely, respectfully, and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

Prior Learning:	Future Learning:
• **YEAR 5 – Video production –** Import video clips, drop them onto a linear editing timeline and drag them into the correct order.	• **YEAR 7 – Clear messaging in digital media –** Select and deploy the correct digital tools to produce clear visual and textual messaging for an audience.

Possible misconceptions	Assessment opportunities:

• Quality is dependent on the microphone, the environment and the techniques used. Learners might expect perfect results from their recordings, but good audio often requires careful editing. • Saving a project keeps the ability to edit, whereas exporting creates a final audio file that cannot be re-edited in the same way.	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Audio production			
Enquiry Question: How does audio bring a visual to life?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To understand a digital footprint.	• A digital footprint is the information created and left behind through online activities. • Information about me may exist online even if I did not post it myself i.e. family, friends. • Websites, apps and online platforms store and collect personal data. • Information shared online can be copies, shared, screenshot or saved by others. • Deleting content does not mean it has disappeared completely. • Online actions today may have consequences in the future.	• Identify information that forms part of a digital footprint. • Recognise examples of personal information and decide what should or should not be shared online. • Analyse scenarios involving online sharing and discuss possible risks and consequences. • Evaluate how online posts and comments can affect someone's reputation. • Reflect on personal online behaviour and justify decisions about safe and responsible online communication.	Advertisement Audience Consent Data Digital footprint Online reputation Permanent Personal information Platform Privacy Responsible Screenshot Sharing Virtual
To identify that sound can be recorded	• Sound recording requires an input device (microphone) to capture physical sound waves and an output device (speakers or headphones) to play it back. • Good audio capture relies on low background noise and proximity to the person speaking. • Recording sound creates a digital data file called an audio track or clip.	• Identify the input and output devices used to record and play sound. • Use a computer to record audio. • Explain that the person who records a sound can say who is allowed to use it.	Audio Microphone Record Sound Speaker
To explain that audio recordings can be edited	• Digital audio software displays sound visually as a waveform, where spikes show loud noises and flat sections show silence. • Audio software allows users to trim, delete, or rearrange sound fragments without ruining the raw file. • Splicing is used to remove mistakes, coughing, or long pauses to make speech sound fluent.	• Re-record a voice to improve a recording. • Inspect the soundwave view to know where to trim the recording. • Discuss what sounds can be added to a podcast.	Evaluate Record Selection Sound

To recognise the different parts of creating a podcast project	• A structured podcast relies on a distinct sequence of pieces, including an introduction (intro), body content, transitions, and an ending (outro). • Media production requires specialized workflow roles, such as the scriptwriter, the voice host, and the audio engineer. • Recording without a written script or outline results in poor timing, structural confusion, and redundant data files.	• Explain how sounds can be combined to make a podcast more engaging. • Save my project so the different parts remain editable. • Plan appropriate content for a podcast.	Podcast Save Sound
To apply audio editing skills independently.	• Audio editing programs use a moving timeline ruler or grid to measure the exact duration of a project in minutes and seconds. • You must explicitly select or highlight a precise section of a waveform before applying a command like cut, copy, or trim.	• Record content following a plan. • Review the quality of a recording. • Improve a voice recording.	Align Edit Evaluate Layer Record Trim
To combine audio to enhance my podcast project	• Modern audio projects use independent vertical tracks to layer different elements (e.g., voice on Track 1, music on Track 2) playing simultaneously. • Background music must be attenuated (lowered in volume) beneath a voiceover track so the speaker remains clear and intelligible.	• Open a project to continue working on it. • Arrange multiple sounds to create the desired effect. • Explain the difference between saving a project and exporting an audio file.	Export File Save
To evaluate the effective use of audio	• Working project files are different from final playable media; projects must be compiled and exported as compressed formats to play on other devices. • Saving as an MP3 file shrinks file size for network distribution by stripping out imperceptible data, making it a "lossy" format. • Evaluation means measuring the final product against the initial script and checking it for technical clarity and listener enjoyment.	• Listen to an audio recording to identify its strengths. • Suggest improvements to an audio recording. • Choose appropriate edits to improve a podcast.	Audio Evaluate Edit Trim Align Layer

Year Six- Sensing movement

National Curriculum Statements:
• Design, write, and debug programs that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts. • Use sequence, selection, and repetition in programs; work with variables and various forms of input and output. • Use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs. • Select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information.

Prior Learning:	Future Learning:

• **YEAR 3 – Repetition in shapes –** Use loop control blocks and using infinite loops to make geometric shapes. • **YEAR 3 – Repetition in games –** Use infinite loops to make characters move. • **YEAR 4 – Sequencing sounds –** Learn the concept of sequential instructions. • **YEAR 5 – Selection in physical computing –** Learn how to build simple loops to turn external outputs on and off. Practice basic conditional selection. • **YEAR 5 – Selection in quizzes –** Use conditional logic in Scratch without physical hardware.	• **YEAR 7 – Micro:bit for primary to secondary transition –** Continues to build on apply knowledge from previous units .

Possible misconceptions	Assessment opportunities:
• The Micro:bit cannot run code inside a web browser. It is an isolated computer chip. It requires the compiled file to be explicitly downloaded and transferred via the USB cable. • Code inside on start runs exactly *once* when the battery turns on. If the condition isn't True at that exact millisecond, the computer skips it and never looks at it again. A conditional check must sit inside a forever loop so the process runs continuously.	• **Formative assessment -** Learners are invited to assess how well they feel they have met the learning objective using thumbs up, thumbs sideways, or thumbs down. • **Assessment rubric**

Sensing movement			
Enquiry Question: How does a computer chip use data to change how a machine behaves?			
Lesson objectives	**Knowledge**	**Skills**	**Vocabulary**
To evaluate ways to maintain a healthy balance between online and offline activities.	• Being connected online can provide many benefits, including communication, learning, creativity and access to information. • Offline activities also provide important benefits, including exercise, social interaction, hobbies, relaxation and wellbeing. • Technology can support friendships, learning and interests when used responsibly. • Certain online activities may take priority over more important tasks if they are not managed carefully. • People can make choices to help create a healthy media balance. • Taking breaks from devices can support physical and emotional wellbeing.	• Evaluate the benefits and drawbacks of different digital activities. • Identify personal habits that contribute to a healthy or unhealthy balance. • Prioritise activities based on importance and personal values. • Suggest practical strategies for maintaining media balance. • Identify opportunities to "unplug" from devices. • Set personal goals relating to healthy technology use. • Justify decisions about balancing online and offline activities.	Balance Digital media Digital wellbeing Habit Media balance Offline activity Online activity Priority Screen time Unplug
To create a program to run on a controllable device	• Developing programs for physical hardware chips involves moving code instructions from an on-screen preview simulation onto tangible hardware.	• Apply knowledge of programming to a new environment. • Test a program on an emulator.	Flashing Make code Micro:bit

	• A controllable device requires its compiled logic file to be transferred ("flashed") via a USB cable or wireless link before it can execute actions independently.	• Transfer a program to a controllable device.	USB
To explain that selection can control the flow of a program	• Selection means using conditional logic to branch the direction or path a program takes. • A conditional statement evaluates an ambient state as either completely True or completely False to dictate what happens next.	• Identify examples of conditions in the real world. • Use a variable in an 'if…then…else' statement to select the flow of a program. • Determine the flow of a program using selection.	Condition If…else…then… Process Selection
To update a variable with a user input	• Physical inputs (like clicking button A, shaking an accelerometer, or touching a pin) can trigger internal data alterations. • Reading, checking, or evaluating a variable's state to make a decision does not modify the number held inside it. • User inputs can be programmed to add to, subtract from, or overwrite a data cell directly while the machine runs.	• Use a condition to change a variable. • Experiment with different physical inputs. • Explain that checking a variable doesn't change its value.	Accelerometer Input Sensing Value Variable
To use a conditional statement to compare a variable to a value	• Conditional statement lines use relational symbols (like >, <, or ==) to match a live variable against a fixed target value. • Computers read code rules sequentially from top to bottom.	• Use an operand in an 'if…then…' statement. • Explain the importance of the order of conditions in 'else…if…' statements. • Modify a program to achieve a different outcome.	Compass Direction Navigation Random Trace
To design a project that uses inputs and outputs on a controllable device	• Hardware physical design requires separating sensory components (inputs, like light cells) from expressive components (outputs, like buzzers or LED displays). • Before compiling scripts, systems designers map out data variables and code flows using written algorithms or flowcharts to reduce bugs.	• Decide what variable to include in a project. • Design the algorithm for a project. • Design the program flow for a project.	Algorithm Design Plan Step-counter Task
To develop a program to use inputs and outputs on a controllable device	• Creating systems requires constantly checking the active block code against the step-by-step goals written in the initial design algorithm. • Physical machines require diagnostic hardware checks under separate conditions to verify that sensors and pins react perfectly every time.	• Create a program based on a design. • Test a program against a design. • Use a range of approaches to find and fix bugs.	Code Create Debug Output Test