Creativity, Curiosity, Caring

Computing Curriculum Sequence

Intent – Our Rationale	It is our intention to provide children with the computational thinking in order for them to understand how digital systems work and what impact that can have on the developing world around us. We focus on developing the skills necessary to use information in an effective way and in doing so we want children to know more, remember more and understand more in computing so that they leave primary school computer literate. Computing skills are a major factor in providing children with the resilience, confidence and creativity to become independent learners and it is our intention that children have every opportunity available to allow them to achieve this. Children will have gained key knowledge and skills in the three main areas of the computing curriculum: computer science (programming and understanding how digital systems work), information technology (using computer systems to store, retrieve and send information) and digital literacy (evaluating digital content and using technology safely and respectfully / online safety). The objectives within each strand support the development of learning across the key stages, ensuring a solid foundation for future learning and beyond.

Curriculum Drivers			
Sustainability	**Cultural Diversity**	**Growth Mindset**	**Oracy**

Autumn 1- Computing Systems and Networks						
Computer Science		**Information Technology**	✓	**Digital Literacy**	✓	
At the end of each year pupils will:	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Topic area	**1.1** Technology Around us	**2.1** IT Around us	**3.1** Connecting Computers	**4.1** The Internet	**5.1** Sharing Information	**6.1** Communication
Know	To identify technology To identify a computer and its main parts	To recognise the uses and features of information technology To identify the uses of information technology in school To identify information technology beyond school To recognise that choices are made when using information technology	To identify input and output devices To recognise how digital devices can change the way we think To recognise the physical components of a network	To describe how networks physically connect to other networks To recognise how networked devices, make up the internet To describe how content can be added to and accessed on the world wide web (WWW) To recognise how the content of the world wide web is created by people	To recognise the role of computer systems in our lives To recognise how information is transferred over the internet	To identify how to use a search engine To describe how search engines select results To recognise why the order of results is important and to whom To recognise how we communicate using technology
Be able to do	To use a mouse in different ways To use a keyboard to type on a computer To use the keyboard to edit text To create rules for using technology responsibly	To explain how information technology can help us To explain how to use information technology safely	To explain how digital devices function To explain how a computer network can be used to share information To explore how digital devices can be connected	To outline how websites can be shared via the world wide web (WWW) To evaluate the consequences of unreliable content	To explain that computers can be connected together to form systems To explain how sharing information online lets people in different places work together To contribute to a shared project online	To explain how search results are ranked To evaluate different methods of online communication

					To evaluate different ways of working together online	
Link to NC	**To use technology safely and respectfully, keeping personal information private**	**To use technology safely and respectfully, keeping personal information private** **To recognise common uses of information technology beyond school**	**To use technology safely, respectfully and responsibly.** **To understand computer networks**	**To use technology safely, respectfully and responsibly.** **To be discerning in evaluating digital content** **To understand computer networks including the internet and how they can provide multiple services, such as the world wide web.**	**To use technology safely, respectfully and responsibly.** **To be discerning in evaluating digital content** **To understand computer networks including the internet and how they can provide multiple services, such as the world wide web.** **To understand the opportunities computer networks, offer for collaboration**	**To use technology safely, respectfully and responsibly.** **To use search technologies effectively and appreciate how results are selected and ranked** **To be discerning in evaluating digital content** **To understand computer networks including the internet and how they can provide multiple services, such as the world wide web.** **To understand the opportunities computer networks, offer for communication and collaboration**
Understand this Vocabulary	Technology Computer Mouse Keyboard Screen Double-click Typing	Information Technology Computer Barcode Scanner/Scan	Digital device Input Process Output Program Digital Non-Digital Connection Network	Internet Network Router/ routing Network security Network switch Server Wireless Access Point Website Web page	System Connection Input Process Output Digital Protocol Address Packets	Search Search engine Refine Index Web crawler Search engine optimisation Ranking Links

			Network switch Server Wireless Access Point Network cable/socket	Web address Web browser World Wide Web (WWW) Links Download Sharing Ownership Permission	Collaboration	Content creator Selection Communication Internet One-way/two-way One-to-one/one-to-many Public Private

Autumn 2 and Summer 1- Creating Media						
Computer Science		**Information Technology**	✓	**Digital Literacy**		
At the end of each year pupils will:	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Topic Area	**1.2** Digital Painting **1.5** Digital Writing	**2.2** Digital Photography **2.5** Making Music	**3.2** Animation **3.5** Desktop Publishing	**4.2** Audio Editing **4.5** Photo Editing	**5.2** Vector Drawing **5.5** Video Editing	**6.2** 3D Modelling **6.5** Web Page Creation
Know	**1.2** To describe what freehand tools do **1.5** To identify that the look of text can be changed on a computer	**2.2** To describe what makes a good photograph To decide how photographs can be improved To recognise that photos can be changed **2.5** To identify that there are patterns in music	**3.2** To identify the need to work consistently and carefully **3.5** To recognise how text and images convey information To recognise that text and layout can be edited	**4.2** To identify that sound can be digitally recorded **4.5** To describe how images can be changed for different uses To recognise that not all images are real	**5.2** To identify that drawing tools can be used to produce different outcomes To recognise that vector drawings consist of layers **5.5** To identify digital devices that can record video To identify that video can be improved through reshooting and editing	**6.2** To identify that physical objects can be broken down into a collection of 3D shapes **6.5** To recognise the need to preview pages To recognise the implications of linking content owned by other pages

Be able to do	**1.2** To use the shape tool and the line tools To make careful choices when painting a digital picture To explain why I chose the tools I used To use a computer on my own to paint a picture To compare painting a picture on a computer and on paper **1.5** To use a computer to write To add and remove text on a computer To make careful choices when changing text To compare typing on a computer to writing on paper	**2.2** To use a digital device to take a photograph To make choices when taking a photograph To use tools to change an image **2.5** To say how music makes us feel To show how music is made from a series of notes To create music for a purpose To review and refine our computer work	**3.2** To explain that animation is a sequence of drawings or photographs To relate animated movement with a sequence of images To plan an animation to review and improve an animation To evaluate the impact of adding other media to an animation **3.5** To choose appropriate page settings To add content to a desktop publishing publication To consider how different layouts can suit different purposes To consider the benefits of desktop publishing	**4.2** To use a digital device to record sound To explain that a digital recording is stored as a file To explain that audio can be changed through editing To show that different types of audio can be combined and played together To evaluate editing choices made **4.5** To explain that digital images can be changed To change the composition of an image To make good choices when selecting different tools To evaluate how changes can improve an image	**5.2** To create a vector drawing by combing shapes To use tools to achieve a desired effect To group objects to make them easier to work with To evaluate my vector drawing **5.5** To explain what makes a video effective To capture video using a range of techniques To create a storyboard To consider the impact of the choices made when making and sharing a video	**6.2** To use a computer to create and manipulate 3D digital objects To compare working digitally with 2D and 3D graphics To construct a digital 3D model of a physical object To design a digital model by combining 3D shapes To develop and improve a digital 3D model **6.5** To review an existing website and consider its structure To plan the features of a webpage To consider the ownership and use of images (copyright) To outline the need for a navigation path
Link to NC	**To use technology purposefully to create, organise, store, manipulate**	**To use technology purposefully to create, organise, store, manipulate**	**To select, use and combine a variety of software on a range of digital devices**	**To select, use and combine a variety of software on a range of digital devices**	**To select, use and combine a variety of software on a range of digital devices**	**To select, use and combine a variety of software (including internet services) on a range of digital devices**

	and retrieve digital content	**and retrieve digital content** **To recognise common uses of information technology beyond school**	**To design and create content that accomplish given goals**	**To design and create content that accomplish given goals, including evaluating** **To use various forms of input and output** **To be discerning in evaluating digital content**	**To design and create content that accomplish given goals, including analysing and evaluating** **To use various forms of input and output** **To be discerning in evaluating digital content**	**To design and create content that accomplish given goals, including analysing and evaluating** **To be discerning in evaluating digital content**
Understand this Vocabulary	**1.2** Tool Paintbrush Erase Fill Undo Shape tool Line tool Brush styles Brush size **1.5** Word Processor Keyboard Keys Letters Type/Typing Numbers Space Backspace Text cursor Capital letters Toolbar Underline Bold Italic Font Undo Redo Format	**2.2** Device Camera Photograph Capture Image Digital Landscape Portrait Framing Subject Compose Light sources Flash Focus Background Editing Filter Format **2.5** Music Pattern Rhythm Pulse/Beat Pitch Tempo Rhythm Notes Instrument	**3.2** Animation Flipbook Stop-frame animation Frame Sequence Image Photograph Setting Character Events Onion skimming Media Import Transition **3.5** Text Images Communicate Font Font style Template Orientation Placeholder Layout Content Desktop publishing Copy Paste	**4.2** Audio Record Playback Microphone Speaker Headphones Input Output Start Pause Stop Podcast File Edit Selection Mixing Time shift Export MP3 Editing **4.5** Image Edit Arrange Select Digital Crop Undo	**5.2** Vector Drawing tools Shapes Icons Toolbar Vector drawing Resize Duplicate/copy Alignment grid Handles Modify Layers **5.5** Video Audio Camera Talking head Panning Close up Mid-range Long shot Moving subject Side-by-side High angle Low angle Normal angle Static camera Zoom	**6.2** 3D shape/object 2D shape/object Resize Rotate Position Select Duplicate Dimensions Placeholder **6.5** Website Webpage Browser Hypertext Mark-up Language (HTML) Layout Header Copyright Preview Breadcrumb trail Navigation Hyperlink Subpage External Link Implication Embed

		Edit	Purpose	Composition Pixels Rotate Flip Adjustments/adjust Effects Hue/saturation Sepia Illustrator Vignette Retouch Clone Magic wand Sharpen Composite Alter Background/foreground Publication Original Layer	Pan Tilt Filming Import Split Trim Reshoot Clip	

Spring 1- Data and Information						
Computer Science		**Information Technology**	✓	**Digital Literacy**		
At the end of each year pupils will:	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Topic Area	**1.3** Grouping Data	**2.3** Pictograms	**3.3** Branching Databases	**4.3** Data Logging	**5.3** Flat File Databases	**6.3** Spreadsheets
Know	To identify that objects can be counted To describe objects in different ways	To recognise that we can count and compare objects using tally charts To recognise that objects can be represented as pictures	To identify the object attributes needed to collect relevant data To identify objects using a branching database	To identify the data needed to answer questions	To outline how grouping and then sorting data allows us to answer questions	To identify questions which can be answered using data

		To recognise that people can be described by attributes				
Be able to do	To label objects To count objects with the same properties To compare groups of objects To answer questions about groups of objects	To create a pictogram To select objects by attribute and make comparisons To explain that we can present information using a computer	To create questions with yes or no answers To create a branching database To explain why it is helpful for a database to be well structured To compare information shown in a pictogram with a branching database	To explain that data gathered over time can be used to answer questions To use a digital device to collect data automatically To explain that a data logger collects 'data points' from sensors over time To use collected data to answer questions	To use a form to record information To compare paper and computer-based databases To explain that tools can be used to select specific data To explain that computer programs can be used to compare data visually To apply my knowledge of a database to ask and answer questions	To explain that objects can be described using data To explain that formulas can be used to produced calculated data To apply formulas to data, including duplicating To create a spreadsheet to plan an event To choose suitable ways to present data
Link to NC	**To use technology purposefully to create, organise, store, manipulate and retrieve digital content**	**To use technology purposefully to create, organise, store, manipulate and retrieve digital content**	**To use a variety of software (including internet services)** **To design and create a range of content that accomplish given goals, including collecting data and information**	**To use a variety of software (including internet services)** **To design and create a range of content that accomplish given goals, including collecting and analysing data and information** **To use various forms of input and output**	**To use a variety of software (including internet services)** **To design and create a range of content that accomplish given goals, including collecting, analysing and evaluating data and information**	**To use a variety of software (including internet services)** **To design and create a range of content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information** **To use various forms of input and output**
Understand this Vocabulary	Object Label Group Search	More/Less Most/Least Organise Data	Attribute Value Branching Databases Database	Data Table Input device Sensor	Database Data Record Field	Spreadsheet Data Data heading Data set

	Image Property/Properties Value More/Less Most/Least/Fewest	Object Tally chart Total Pictogram Attributes Common Popular Block Diagram Sharing	Structure Compare Organise Selecting Tally chart Block diagram Pictogram Data	Data logger Data point Interval Analyse Data set Import Export Conclusion	Value Criteria Flat file database Chart Graph Axis Filter	Cells Columns Rows Common attribute Formula Cell reference Input Output Operation Range Duplicate Sigma Graph Software Comparison

Spring 2 and Summer 2- Programming						
Computer Science ✓		**Information Technology**		**Digital Literacy**		
At the end of each year pupils will:	**Year 1**	**Year 2**	**Year 3**	**Year 4**	**Year 5**	**Year 6**
Topic Area	**1.4** Moving a Robot **1.6** Introduction to Animation	**2.4** Robot Algorithms **2.6** Introduction to Quizzes	**3.4** Sequence in Music **3.6** Events and Actions	**4.4** Repetition in Shapes **4.6** Repetition in Games	**5.4** Selection in Physical Computing (Crumbles) **5.6** Selection in Quizzes	**6.4** Variables in Games **6.6** Sensing (Micro:Bits)
Know	**1.6** To identify the effect of changing a value	**2.4** To describe a series of instructions as a sequence **2.6** To decide how my project can be improved	**3.4** To identify that commands have an outcome To recognise that a sequence of commands can have an order **3.6**	**4.4** To identify that accuracy in programming is important		**6.4** To define a 'variable' as something that is changeable

			To identify and fix bugs in a program			
Be able to do	**1.4** To explain what a given command will do To act out a given word To combine forwards and backwards commands to make a sequence To combine four direction commands to make sequences To plan a simple program To find more than one solution to a problem **1.6** To choose a command for a given purpose To show that a series of commands can be joined together To explain that each sprite has its own set of instructions To design the parts of a project To use my algorithm to create a program	**2.4** To explain what happens when we change the order of instructions To use logical reasoning to predict the outcome of a program To explain that programming projects can have code and artwork To design an algorithm To create and debug a program that I have written **2.6** To explain that a sequence of commands has a start To explain that a sequence of commands has an outcome To change a given design To create a program using my own design	**3.4** To explore a new programming environment To explain that a program has a start To change the appearance of my project To create a project from a task description **3.6** To explain how a sprite moves in an existing project To create a program to move a sprite in four directions To adapt a program to a new context To develop a program by adding features To design and create a maze-based challenge	**4.4** To create a program in text-based language To explain what 'repeat' means To modify a count-controlled loop to produce a given outcome To decompose a task into small steps To create a program that uses count-controlled loops to produce a given outcome **4.6** To develop the use of count-controlled loops in a different programming environment To explain that in programming there are infinite loops and count-controlled loops To develop a design that includes two or more loops which run at the same time	**5.4** To control a simple circuit connected by a computer To write a program that includes count-controlled loops To explain that a loop can stop when a condition is met To explain that a loop can be used to repeatedly check whether a condition has been met To design a physical project that includes selection To create a program that controls a physical computing project **5.6** To explain how selection is used in computer programs To relate that a conditional statement connects a condition to an outcome	**6.4** To explain why a variable is used in a program To choose how to improve a game by using variables To design a project that builds on given examples To use my design to create a project To evaluate my project **6.6** To create a program to run on a controllable device To explain that selection can control the flow of a program To update a variable with a user input To use a conditional statement to compare a variable to a value To design a project that uses inputs and outputs on a controllable device

				To modify an infinite loop in a given program To design a project that includes repetition To create a project that includes repetition	To explain how selection directs the flow of a program To design a program which uses selection To create a program which uses selection To evaluate my program	To develop a program to use inputs and outputs on a controllable device
Link to NC	**To understand what algorithms are** **To understand how algorithms are implemented as programs on digital devices**	**To understand what algorithms are** **To understand how algorithms are implemented as programs on digital devices and that programs execute by following precise and unambiguous instructions** **To debug simple problems** **To use logical reasoning to predict the behaviour of simple programs**	**To write and debug programs that accomplish specific goals.** **To use sequence in programs** **To use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs** **To use various forms of input and output**	**To design, write and debug programs that accomplish specific goals** **To use sequence and repetition in programs** **To use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs** **To solve problems by decomposing them into smaller parts**	**To design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems** **To use sequence, repetition and selection in programs** **To use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs** **To solve problems by decomposing them into smaller parts** **To use various forms of input and output**	**To design, write and debug programs that accomplish specific goals, including controlling or simulating physical systems** **To use sequence, repetition and selection in programs** **To work with variables and various forms of input and output** **To use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs** **To solve problems by decomposing them into smaller parts**

						To use various forms of input and output
Understand this Vocabulary	Algorithms Program Commands Predict	Algorithms Program Debug Unambiguous Commands Predict/Prediction Outcome Modify	Algorithms* Program* Debug* *By the end of KS1 Commands Sequence Logical reasoning Actions Events	Algorithms* Program* Debug* *By the end of KS1 Commands Repetition Count-controlled loop Decompose Procedure Infinite loops	Algorithms* Program* Debug* *By the end of KS1 Selection Components Infinite loops Count-controlled loops Output component Condition Conditional statement	Algorithms* Program* Debug* *By the end of KS1 Variable Value Code Micro: Bit Sensing Accelerometer