



# Computing Progression at NLAS

## Intent

Our aim is for all pupils to be knowledgeable, expressive and inspired:

In computing this means children learn through a well-designed sequential curriculum. The different aspects of computing, such as programming, creating digital content and online safety, are taught by a specialist teacher to support children to acquire the knowledge and skills they will need to be successful in a digital world.

Our Four Curriculum Drivers underpin our approach to learning across all subjects at NLAS.

### Global Citizens



### Healthy Body, Healthy Mind



### Adventure & Exploration



### Aspirations



Our intent is that our children learn: programming skills, how to be safe in the online world, how to create digital media in creative and functional ways, how computer systems are connected and how databases are used to store information. Children develop the knowledge and skills to apply their programming skills across different platforms and be confident, productive and safe when using digital resources.

Through the teaching of subject specific technical vocabulary, children develop their ability to explain computer terms such as algorithm, database, debugging and process. Children will be able to tell someone if they are feel unsafe whilst using digital technology. They will be able to question information they read, see or hear online.

Linking the content of the curriculum to our 10 core values and our All Saints' Way is essential in the teaching of computing: empowering children with the confidence to have a go, to learn from mistakes and to keep trying and improving.



Wherever possible, diverse role models are used to encourage all children to see themselves as being successful programmers and users of technology. The focus on having a growth mind-set is essential in the teaching of programming. In order to succeed in programming tasks, the children must show perseverance in order to debug their mistakes.

Children explore the purposes of computing within a context as well as its meaning within their own life and future e.g. using computing lessons to support art, music and science. Children have opportunities to use computing across the curriculum for real life purposes e.g. creating a climate change animation to raise awareness as part of the school environment focus.

All children, including those who have SEND or are disadvantaged are supported to fully access our curriculum. This may include additional adult support or the use of visuals, structured sentence stems, resources, etc. which acts as a scaffold for children's learning.

## Implementation

The Computing scheme of work is based on the *Teach Computing* curriculum created by the National Centre for Computing Education. The scheme fits the needs of our children across all key stages. It lays out the sequential steps to be taught so that new knowledge and skills build on what has been taught before and pupils can work towards clearly defined high quality outcomes.

Children from Y1 to Y6 have a weekly computing lesson taught by class teachers. Pupils in EYFS are given opportunities to develop basic computing skills through their continuous provision.

The majority of the curriculum is taught through the use of Chromebooks but iPads are also used to support the teaching of specific units. Chromebooks and iPads are regularly updated to ensure children have access to up to date technology. Where equipment is not available we use the local cluster or feeder high schools to provide extended opportunities to develop deeper projects such as using Mircobits.

Computing is taught in units, enabling children to develop and build upon their knowledge and understanding of each area of computing.

Each strand of computing (programming, creating media, data and information and computer systems) is covered and revisited so that pupils retain and build upon prior learning.

The Computing lead supports teachers and monitors standards by talking to children, monitoring digital portfolios and completing walkthroughs and drop ins of lessons. Governors are also involved in these processes.

## Impact

Children at NLAS enjoy computer lessons and have opportunities to succeed in the wide variety of digital tasks. They build practical skills to enable them to successfully access technology and prepare them for secondary school and beyond. They work collaboratively with their peers to build teamwork skills. Children understand how to keep themselves safe and how to seek help and support if they experience dangers online.



## Whole School Computing Overview by Year Group

	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
EYFS	<p><b>Personal, Social and Emotional Development</b> Be confident to try new activities and show independence, resilience and perseverance in the face of challenge Explain the reasons for rules, know right from wrong and try to behave accordingly</p> <p><b>Expressive Arts and Design</b> Safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function</p>					
Year 1	<p><b>Computing Systems &amp; Networks – Technology around us</b></p> <ul style="list-style-type: none"> <li>To identify technology</li> <li>To identify a computer and its main parts</li> <li>To use a mouse in different ways</li> <li>To use a keyboard to type on a computer</li> <li>To use the keyboard to edit text</li> <li>To create rules for using technology responsibly</li> </ul>	<p><b>Creating Media – digital painting</b></p> <ul style="list-style-type: none"> <li>To describe what different freehand tools do</li> <li>To use the shape tool and the line tools</li> <li>To make careful choices when painting a digital picture</li> <li>To explain why I chose the tools I used</li> <li>To use a computer on my own to paint a picture</li> <li>To compare painting a picture on a computer and on paper</li> </ul>	<p><b>Programming A – Moving a Robot</b></p> <ul style="list-style-type: none"> <li>To explain what a given command will do</li> <li>To act out a given word</li> <li>To combine forwards and backwards commands to make a sequence</li> <li>To combine four direction commands to make sequences</li> <li>To plan a simple program</li> <li>To find more than one solution to a problem</li> </ul>	<p><b>Programming B – Programming Animations</b></p> <ul style="list-style-type: none"> <li>To choose a command for a given purpose</li> <li>To show that a series of commands can be joined together</li> <li>To identify the effect of changing a value</li> <li>To explain that each sprite has its own instructions</li> <li>To design the parts of a project</li> <li>To use my algorithm to create a program</li> </ul>	<p><b>Data &amp; Information – grouping data</b></p> <ul style="list-style-type: none"> <li>To label objects</li> <li>To identify that objects can be counted</li> <li>To describe objects in different ways</li> <li>To count objects with the same properties</li> <li>To compare groups of objects</li> <li>To answer questions about groups of objects</li> </ul>	<p><b>Creating Media – Digital Writing</b></p> <ul style="list-style-type: none"> <li>To use a computer to write</li> <li>To add and remove text on a computer</li> <li>To identify that the look of text can be changed on a computer</li> <li>To make careful choices when changing text</li> <li>To explain why I used the tools that I chose</li> <li>To compare typing on a computer to writing on paper</li> </ul>
Year 2	<p><b>Creating Media – digital photography</b></p> <ul style="list-style-type: none"> <li>To use a digital device to take a photograph</li> <li>To make choices when taking a photograph</li> <li>To describe what makes a good photograph</li> <li>To decide how photographs can be improved</li> <li>To use tools to change an image</li> <li>To recognise that photos can be changed</li> </ul>	<p><b>Computing Systems &amp; Networks – IT around us</b></p> <ul style="list-style-type: none"> <li>To recognise the uses and features of information technology</li> <li>To identify the uses of information technology in school</li> <li>To identify information technology beyond school</li> <li>To explain how information technology helps us</li> <li>To explain how to use information technology safely</li> <li>To recognise that choices are made when using information technology</li> </ul>	<p><b>Programming A – Robot Algorithms</b></p> <ul style="list-style-type: none"> <li>To describe a series of instructions as a sequence</li> <li>To explain what happens when we change the order of instructions</li> <li>To use logical reasoning to predict the outcome of a program</li> <li>To explain that programming projects can have code and artwork</li> <li>To design an algorithm</li> <li>To create and debug a program that I have written</li> </ul>	<p><b>Data &amp; Information – pictograms</b></p> <ul style="list-style-type: none"> <li>To recognise that we can count and compare objects using tally charts</li> <li>To recognise that objects can be represented as pictures</li> <li>To create a pictogram</li> <li>To select objects by attribute and make comparisons</li> <li>To recognise that people can be described by attributes</li> <li>To explain that we can present information using a computer</li> </ul>	<p><b>Programming B – Programming Quizzes</b></p> <ul style="list-style-type: none"> <li>To explain that a sequence of commands has a start</li> <li>To explain that a sequence of commands has an outcome</li> <li>To create a program using a given design</li> <li>To change a given design</li> <li>To create a program using my own design</li> <li>To decide how my project can be improved</li> </ul>	<p><b>Creating Media – Digital Music</b></p> <ul style="list-style-type: none"> <li>To say how music can make us feel</li> <li>To identify that there are patterns in music</li> <li>To experiment with sound using a computer</li> <li>To use a computer to create a musical pattern</li> <li>To create music for a purpose</li> <li>To review and refine our computer work</li> </ul>



	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 3	<p>Creating Media – Desktop Publishing</p> <ul style="list-style-type: none"> <li>• To recognise how text and images convey information</li> <li>• To recognise that text and layout can be edited</li> <li>• To choose appropriate page settings</li> <li>• To add content to a desktop publishing publication</li> <li>• To consider how different layouts can suite different purposes</li> <li>• To consider the benefits of desktop publishing</li> </ul>	<p>Creating Media – Stop-frame animation</p> <ul style="list-style-type: none"> <li>• To explain that animation is a sequence of drawings and photographs</li> <li>• To relate animated movement with a sequence of images</li> <li>• To plan an animation</li> <li>• To identify the need to work consistently and carefully</li> <li>• To review and improve an animation</li> <li>• To evaluate the impact of adding other media to an animation</li> </ul>	<p>Computing Systems &amp; Networks – Connecting Computers</p> <ul style="list-style-type: none"> <li>• To explain how digital devices function</li> <li>• To identify input and output devices</li> <li>• To explain how digital devices can change the way we work</li> <li>• To explain how a computer network can be used to share information</li> <li>• To explore how digital devices can be connected</li> <li>• To recognise the physical components of a network</li> </ul>	<p>Data &amp; Information – Branching Databases</p> <ul style="list-style-type: none"> <li>• To create questions with yes/no answers</li> <li>• To identify the attributes needed to collect data about an object</li> <li>• To create a branching database</li> <li>• To explain why it is helpful for a database to be well structured</li> <li>• To plan the structure of a branching database</li> <li>• To independently create an identification tool</li> </ul>	<p>Programming A – Sequencing Sounds</p> <ul style="list-style-type: none"> <li>• To explore a new programming environment</li> <li>• To identify that commands have an outcome</li> <li>• To explain that a program has a start</li> <li>• To recognise that a sequence of commands can have an order</li> <li>• To change the appearance of my project</li> <li>• To create a project from a task description</li> </ul>	<p>Programming B – Events and actions in programs</p> <ul style="list-style-type: none"> <li>• To explain how a sprite moves in an existing project</li> <li>• To create a program to move a sprite in four directions</li> <li>• To adapt a program to a new context</li> <li>• To develop my program by adding features</li> <li>• To identify and fix bugs in a program</li> <li>• To design and create a maze-based challenge</li> </ul>
Year 4	<p>Computing Systems &amp; Networks – The Internet</p> <ul style="list-style-type: none"> <li>• To describe how networks physically connect to other networks</li> <li>• To recognise how networked devices make up the internet</li> <li>• To outline how websites can be shared via the World Wide Web</li> <li>• To describe how content can be added and accessed on the World Wide Web</li> <li>• To recognise how the content of the WWW is created by people</li> <li>• To evaluate the consequences of unreliable content</li> </ul>	<p>Creating Media – Photo editing</p> <ul style="list-style-type: none"> <li>• To explain that the composition of digital images can be changed</li> <li>• To explain that colours can be changed in digital images</li> <li>• To explain how cloning can be used in photo editing</li> <li>• To explain that images can be combined</li> <li>• To combine images for a purpose</li> <li>• To evaluate how changes can improve an image</li> </ul>	<p>Programming A – Repetition in shapes</p> <ul style="list-style-type: none"> <li>• To identify that accuracy in programming is important</li> <li>• To create a program in a text-based language</li> <li>• To explain what ‘repeat’ means</li> <li>• To modify a count-controlled loop to produce a given outcome</li> <li>• To decompose a task into small steps</li> <li>• To create a program that uses count-controlled loops to produce a given outcome</li> </ul>	<p>Data &amp; Information – Data logging</p> <ul style="list-style-type: none"> <li>• To explain that data gathered over time can be used to answer questions</li> <li>• To use a digital device to collect data automatically</li> <li>• To explain that a data logger collects ‘data points’ from sensors over time</li> <li>• To recognise how a computer can help us analyse data</li> <li>• To identify the data needed to answer questions</li> <li>• To use data from sensors to answer questions</li> </ul>	<p>Creating Media – Audio Production</p> <ul style="list-style-type: none"> <li>• To identify that sound can be recorded</li> <li>• To explain that audio recordings can be edited</li> <li>• To recognise the different parts of creating a podcast project</li> <li>• To apply audio editing skills independently</li> <li>• To combine audio to enhance my podcast project</li> <li>• To evaluate the effective use of audio</li> </ul>	<p>Programming B – Repetition in Games</p> <ul style="list-style-type: none"> <li>• To develop the use of count-controlled loops in a different programming environment</li> <li>• To explain that in programming there are infinite loops and count controlled loops</li> <li>• To develop a design that includes two or more loops which run at the same time</li> <li>• To modify an infinite loop in a given program</li> <li>• To design a project that includes repetition</li> <li>• To create a project that includes repetition</li> </ul>



	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Year 5	<p>Creating Media – Video production</p> <ul style="list-style-type: none"> <li>• To explain what makes a video effective</li> <li>• To identify digital devices that can record video</li> <li>• To capture video using a range of techniques</li> <li>• To create a storyboard</li> <li>• To identify that video can be improved through reshooting and editing</li> <li>• To consider the impact of the choices made when making and sharing a video</li> </ul>	<p>Computing Systems &amp; Networks – Systems &amp; Searching</p> <ul style="list-style-type: none"> <li>• To explain that computers can be connected together to form systems</li> <li>• To recognise the role of computer systems in our lives</li> <li>• To experiment with search engines</li> <li>• To describe how search engines select results</li> <li>• To explain how search results are ranked</li> <li>• To recognise why the order of results is important, and to whom</li> </ul>	<p>Data &amp; Information – Flat-file databases</p> <ul style="list-style-type: none"> <li>• To use a form to record information</li> <li>• To compare paper and computer-based databases</li> <li>• To outline how you can answer questions by grouping and then sorting data</li> <li>• To explain that tools can be used to select specific data</li> <li>• To explain that computer programs can be used to compare data visually</li> <li>• To use a real-world database to answer questions</li> </ul>	<p>Programming A – Selection in Physical computing</p> <ul style="list-style-type: none"> <li>• To control a simple circuit connected to a computer</li> <li>• To write a program that includes count-controlled loops</li> <li>• To explain that a loop can stop when a condition is met</li> <li>• To explain that a loop can be used to repeatedly check whether a condition has been met</li> <li>• To design a physical project that includes selection</li> <li>• To create a program that controls a physical computing project</li> </ul>	<p>Creating Media – Introduction to vector graphics</p> <ul style="list-style-type: none"> <li>• To identify that drawing tools can be used to produce different outcomes</li> <li>• To create a vector drawing by combining shapes</li> <li>• To use tools to achieve a desired effect</li> <li>• To recognise that vector drawings consist of layers</li> <li>• To group objects to make them easier to work with</li> <li>• To apply what I have learned about vector drawings</li> </ul>	<p>Programming B – Selection in quizzes</p> <ul style="list-style-type: none"> <li>• To explain how selection is used in computer programs</li> <li>• To relate that a conditional statement connects a condition to an outcome</li> <li>• To explain how selection directs the flow of a program</li> <li>• To design a program which uses selection</li> <li>• To create a program which uses selection</li> <li>• To evaluate my program</li> </ul>
Year 6	<p>Creating Media – webpage creation</p> <ul style="list-style-type: none"> <li>• To review an existing website and consider its structure</li> <li>• To plan the features of a web page</li> <li>• To consider the ownership and use of images (copyright)</li> <li>• To recognise the need to preview pages</li> <li>• To outline the need for a navigation path</li> <li>• To recognise the implications of linking to content owned by other people</li> </ul>	<p>Programming A – variables in games</p> <ul style="list-style-type: none"> <li>• To define a 'variable' as something that is changeable</li> <li>• To explain why a variable is used in a program</li> <li>• To choose how to improve a game by using variables</li> <li>• To design a project that builds on a given example</li> <li>• To use my design to create a project</li> <li>• To evaluate my project</li> </ul>	<p>Programming B – Sensing movement</p> <ul style="list-style-type: none"> <li>• To create a program to run on a controllable device</li> <li>• To explain that selection can control the flow of a program</li> <li>• To update a variable with a user input</li> <li>• To use a conditional statement to compare a variable to a value</li> <li>• To design a project that uses inputs and outputs on a controllable device</li> <li>• To develop a program to use inputs and outputs on a controllable device</li> </ul>	<p>Data &amp; Information – introduction to spreadsheets</p> <ul style="list-style-type: none"> <li>• To create a data set in a spreadsheet</li> <li>• To build a data set in a spreadsheet</li> <li>• To explain that formulas can be used to produce calculated data</li> <li>• To apply formulas to data</li> <li>• To create a spreadsheet to plan an event</li> <li>• To choose suitable ways to prevent data</li> </ul>	<p>Computing Systems &amp; Networks – Communication &amp; Collaboration</p> <ul style="list-style-type: none"> <li>• To explain the importance of internet addresses</li> <li>• To recognise how data is transferred across the internet</li> <li>• To explain how sharing information online can help people to work together</li> <li>• To evaluate different ways of working together online</li> <li>• To recognise how we communicate using technology</li> <li>• To evaluate different methods of online communication</li> </ul>	<p>Creating Media – 3D modelling</p> <ul style="list-style-type: none"> <li>• To recognise that you can work in three dimensions on a computer</li> <li>• To identify that digital 3D objects can be modified</li> <li>• To recognise that objects can be combined in a 3D model</li> <li>• To create a 3D model for a given purpose</li> <li>• To plan my own 3D model</li> <li>• To create my own digital 3D model</li> </ul>



## Whole School Progression of knowledge and vocabulary by Strand

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computer Systems and Networks	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• identify technology</li> <li>• identify a computer and its main parts</li> <li>• use a mouse in different ways</li> <li>• use a keyboard to type on a computer</li> <li>• use the keyboard to edit text</li> <li>• create rules for using technology responsibly</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• recognise the uses and features of information technology</li> <li>• identify the uses of information technology in school</li> <li>• identify information technology beyond school</li> <li>• explain how information technology helps us</li> <li>• explain how to use information technology safely</li> <li>• recognise that choices are made when using information technology</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• explain how digital devices function</li> <li>• identify input and output devices</li> <li>• explain how digital devices can change the way we work</li> <li>• explain how a computer network can be used to share information</li> <li>• explore how digital devices can be connected</li> <li>• recognise the physical components of a network</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• describe how networks physically connect to other networks</li> <li>• recognise how networked devices make up the internet</li> <li>• outline how websites can be shared via the World Wide Web</li> <li>• describe how content can be added and accessed on the World Wide Web</li> <li>• recognise how the content of the WWW is created by people</li> <li>• evaluate the consequences of unreliable content</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• explain that computers can be connected together to form systems</li> <li>• recognise the role of computer systems in our lives</li> <li>• experiment with search engines</li> <li>• describe how search engines select results</li> <li>• explain how search results are ranked</li> <li>• recognise why the order of results is important, and to whom</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• explain the importance of internet addresses</li> <li>• recognise how data is transferred across the internet</li> <li>• explain how sharing information online can help people to work together</li> <li>• evaluate different ways of working together online</li> <li>• recognise how we communicate using technology</li> <li>• evaluate different methods of online communication</li> </ul>
	<p><u>Key Vocabulary:</u></p> <p>computer, technology, login, keyboard, keys, mouse, trackpad, click, drag, save, file, typing, arrow keys, cursor, delete</p>	<p><u>Key Vocabulary:</u></p> <p>information technology, device, online safety, website</p>	<p><u>Key Vocabulary:</u></p> <p>input, output, process, digital devices, non-digital tools, wire, tablet, WiFi, smartphone, mobile phone network, users, systems, connections, messages, network switch, wireless access point, functionality, component, infrastructure</p>	<p><u>Key Vocabulary:</u></p> <p>network, messages, internet, network devices, router, world wide web, website, web page, services, upload, access, media, content, ownership, accuracy, re-share, ambiguous, misleading</p>	<p><u>Key Vocabulary:</u></p> <p>system, components, digital system, inputs, processes, outputs, devices, search engine, results, refine, address bar, web search, compare, web crawlers, tools, index, webpage, content, rank, order, criteria, content creators, influence, limitations</p>	<p><u>Key Vocabulary:</u></p> <p>protocols, IP address, domain name server, data, transfer, internet devices, data packet, images, video, audio, header, data payload, collaboration, shared files, media, public, private, copyright, communication, purpose</p>



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
<b>Creating Media</b>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• describe what different freehand tools do</li> <li>• use the shape tool and the line tools</li> <li>• make careful choices when painting a digital picture</li> <li>• explain why I chose the tools I used</li> <li>• use a computer on my own to paint a picture</li> <li>• compare painting a picture on a computer and on paper</li> <li>• use a computer to write</li> <li>• add and remove text on a computer</li> <li>• identify that the look of text can be changed on a computer</li> <li>• make careful choices when changing text</li> <li>• explain why I used the tools that I chose</li> <li>• compare typing on a computer to writing on paper</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• use a digital device to take a photograph</li> <li>• make choices when taking a photograph</li> <li>• describe what makes a good photograph</li> <li>• decide how photographs can be improved</li> <li>• use tools to change an image</li> <li>• recognise that photos can be changed</li> <li>• say how music can make us feel</li> <li>• identify that there are patterns in music</li> <li>• experiment with sound using a computer</li> <li>• use a computer to create a musical pattern</li> <li>• create music for a purpose</li> <li>• review and refine our computer work</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• explain that animation is a sequence of drawings and photographs</li> <li>• relate animated movement with a sequence of images</li> <li>• plan an animation</li> <li>• identify the need to work consistently and carefully</li> <li>• review and improve an animation</li> <li>• evaluate the impact of adding other media to an animation</li> <li>• recognise how text and images convey information</li> <li>• recognise that text and layout can be edited</li> <li>• choose appropriate page settings</li> <li>• add content to a desktop publishing publication</li> <li>• consider how different layouts can suite different purposes</li> <li>• consider the benefits of desktop publishing</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• identify that sound can be recorded</li> <li>• explain that audio recordings can be edited</li> <li>• recognise the different parts of creating a podcast project</li> <li>• apply audio editing skills independently</li> <li>• combine audio to enhance my podcast project</li> <li>• evaluate the effective use of audio</li> <li>• explain that the composition of digital images can be changed</li> <li>• to explain that colours can be changed in digital images</li> <li>• explain how cloning can be used in photo editing</li> <li>• explain that images can be combined</li> <li>• combine images for a purpose</li> <li>• evaluate how changes can improve an image</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• explain what makes a video effective</li> <li>• identify digital devices that can record video</li> <li>• capture video using a range of techniques</li> <li>• create a storyboard</li> <li>• identify that video can be improved through reshooting and editing</li> <li>• consider the impact of the choices made when making and sharing a video</li> <li>• identify that drawing tools can be used to produce different outcomes</li> <li>• create a vector drawing by combining shapes</li> <li>• use tools to achieve a desired effect</li> <li>• recognise that vector drawings consist of layers</li> <li>• group objects to make them easier to work with</li> <li>• apply what I have learned about vector drawings</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• review an existing website and consider its structure</li> <li>• plan the features of a web page</li> <li>• consider the ownership and use of images (copyright)</li> <li>• recognise the need to preview pages</li> <li>• outline the need for a navigation path</li> <li>• recognise the implications of linking to content owned by other people</li> <li>• recognise that you can work in three dimensions on a computer</li> <li>• identify that digital 3D objects can be modified</li> <li>• recognise that objects can be combined in a 3D model</li> <li>• create a 3D model for a given purpose</li> <li>• plan my own 3D model</li> <li>• create my own digital 3D model</li> </ul>
	<p><u>Key Vocabulary:</u></p> <p><i>Digital painting:</i> tools, screen, paint tool, line tool, shape tool, fill, undo, digital painting, brush tool, brush size</p> <p><i>Digital writing:</i> keys, keyboard, word processor, text, space key, backspace, Caps Lock, toolbar, bold, italic, underline, click, double-click, drag, font, cursor</p>	<p><u>Key Vocabulary:</u></p> <p><i>Digital photography:</i> device, capture, digital photo, landscape, portrait, format, light source, camera flash, adjust, tool, effect, edit</p> <p><i>Digital music:</i> rhythm, pattern, pitch, notes, melody, sequence, review</p>	<p><u>Key Vocabulary:</u></p> <p><i>Stop-frame animation:</i> animation, flipbook, frame, stop-frame, storyboard, onion skinning, media, audio, text</p> <p><i>Desktop publishing:</i> text, images, desktop publishing, layout, font style, edit, return, backspace, shift, template, page orientation, placeholder</p>	<p><u>Key Vocabulary:</u></p> <p><i>Audio production:</i> inputs, outputs, copyright, record, audio file, soundwave, trim, podcast, voice recording, fade, sound effects, project, export</p> <p><i>Photo editing:</i> rotate, crop, image editor, composition, filter, cloning, retouching, duplicate, copy, paste, ethics</p>	<p><u>Key Vocabulary:</u></p> <p><i>Video production:</i> visual media format, digital video recording device, camera angle, storyboard, project, capture, scene, content, store, retrieve, export, reshooting, clips</p> <p><i>Vector graphics:</i> vector drawings, element, resizing, rotating, duplicate, zoom, alignment grids, resize handles, modify, layers, group, ungroup</p>	<p><u>Key Vocabulary:</u></p> <p><i>Web page creation:</i> HTML code, layout, copyright, fair-use, navigation paths, hyperlinks, user</p> <p><i>3D modelling:</i> dimensions, manipulate, resize, recolour, rotate, duplicate, group, ungroup, placeholders</p>



	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Programming	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• explain what a given command will do</li> <li>• act out a given word</li> <li>• combine forwards and backwards commands to make a sequence</li> <li>• combine four direction commands to make sequences</li> <li>• plan a simple program</li> <li>• find more than one solution to a problem</li> <li>• choose a command for a given purpose</li> <li>• show that a series of commands can be joined together</li> <li>• identify the effect of changing a value</li> <li>• explain that each sprite has its own instructions</li> <li>• design the parts of a project</li> <li>• use my algorithm to create a program</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• describe a series of instructions as a sequence</li> <li>• explain what happens when we change the order of instructions</li> <li>• use logical reasoning to predict the outcome of a program</li> <li>• explain that programming projects can have code and artwork</li> <li>• design an algorithm</li> <li>• create and debug a program that I have written</li> <li>• explain that a sequence of commands has a start</li> <li>• explain that a sequence of commands has an outcome</li> <li>• create a program using a given design</li> <li>• change a given design</li> <li>• create a program using my own design</li> <li>• decide how my project can be improved</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• explore a new programming environment</li> <li>• identify that commands have an outcome</li> <li>• explain that a program has a start</li> <li>• recognise that a sequence of commands can have an order</li> <li>• change the appearance of my project</li> <li>• create a project from a task description</li> <li>• explain how a sprite moves in an existing project</li> <li>• create a program to move a sprite in four directions</li> <li>• adapt a program to a new context</li> <li>• develop my program by adding features</li> <li>• identify and fix bugs in a program</li> <li>• design and create a maze-based challenge</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• identify that accuracy in programming is important</li> <li>• create a program in a text-based language</li> <li>• explain what 'repeat' means</li> <li>• modify a count-controlled loop to produce a given outcome</li> <li>• decompose a task into small steps</li> <li>• create a program that uses count-controlled loops to produce a given outcome</li> <li>• develop the use of count-controlled loops in a different programming environment</li> <li>• explain that in programming there are infinite loops and count-controlled loops</li> <li>• develop a design that includes two or more loops which run at the same time</li> <li>• modify an infinite loop in a given program</li> <li>• design and create a project that includes repetition</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• control a simple circuit connected to a computer</li> <li>• write a program that includes count-controlled loops</li> <li>• explain that a loop can stop when a condition is met</li> <li>• explain that a loop can be used to repeatedly check whether a condition has been met</li> <li>• design a physical project that includes selection</li> <li>• create a program that controls a physical computing project</li> <li>• explain how selection is used in computer programs</li> <li>• relate that a conditional statement connects a condition to an outcome</li> <li>• explain how selection directs the flow of a program</li> <li>• design and create a program which uses selection</li> <li>• evaluate my program</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• define a 'variable' as something that is changeable</li> <li>• explain why a variable is used in a program</li> <li>• choose how to improve a game by using variables</li> <li>• design a project that builds on a given example</li> <li>• use my design to create a project</li> <li>• evaluate my project</li> <li>• create a program to run on a controllable device</li> <li>• explain that selection can control the flow of a program</li> <li>• update a variable with a user input</li> <li>• use a conditional statement to compare a variable to a value</li> <li>• design a project that uses inputs and outputs on a controllable device</li> <li>• develop a program to use inputs and outputs on a controllable device</li> </ul>
	<p><u>Key Vocabulary:</u></p> <p>robot, command, outcome, device, instruction, directions, forwards, backwards, sequence, left, right, turn, program, debug, sprite, block, value, algorithm</p>	<p><u>Key Vocabulary:</u></p> <p>instructions, sequence, algorithm, outcomes, commands, prediction, code, design, debug, sprite, blocks</p>	<p><u>Key Vocabulary:</u></p> <p>sprite, backdrop, commands, blocks, code, outcome, motion blocks, event blocks, algorithm, actions, directions, pen blocks, sequences, setup blocks, program, evaluate</p>	<p><u>Key Vocabulary:</u></p> <p>programming, code, commands, algorithms, repetition, count-controlled loop, repeat loop, procedure, code snippets, debugging, infinite loops, project, evaluate</p>	<p><u>Key Vocabulary:</u></p> <p>Crumble controller, LED, microcontroller, infinite loops, output, component, control outputs, count-controlled loops, condition, input, actions, algorithms, debug, selection, if statements, setup code</p>	<p><u>Key Vocabulary:</u></p> <p>variable, program, placeholder, algorithm, program flow, code, micro:bit, emulator, controllable device, conditions, if statement, inputs, accelerometer, sensor, operand, bugs</p>





	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Data and Information	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• label objects</li> <li>• identify that objects can be counted</li> <li>• describe objects in different ways</li> <li>• count objects with the same properties</li> <li>• compare groups of objects</li> <li>• answer questions about groups of objects</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• recognise that we can count and compare objects using tally charts</li> <li>• recognise that objects can be represented as pictures</li> <li>• create a pictogram</li> <li>• select objects by attribute and make comparisons</li> <li>• recognise that people can be described by attributes</li> <li>• explain that we can present information using a computer</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• create questions with yes/no answers</li> <li>• identify the attributes needed to collect data about an object</li> <li>• create a branching database</li> <li>• explain why it is helpful for a database to be well structured</li> <li>• plan the structure of a branching database</li> <li>• independently create an identification tool</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• explain that data gathered over time can be used to answer questions</li> <li>• use a digital device to collect data automatically</li> <li>• explain that a data logger collects 'data points' from sensors over time</li> <li>• recognise how a computer can help us analyse data</li> <li>• identify the data needed to answer questions</li> <li>• use data from sensors to answer questions</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• use a form to record information</li> <li>• compare paper and computer-based databases</li> <li>• outline how you can answer questions by grouping and then sorting data</li> <li>• explain that tools can be used to select specific data</li> <li>• explain that computer programs can be used to compare data visually</li> <li>• use a real-world database to answer questions</li> </ul>	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> <li>• create a data set in a spreadsheet</li> <li>• build a data set in a spreadsheet</li> <li>• explain that formulas can be used to produce calculated data</li> <li>• apply formulas to data</li> <li>• create a spreadsheet to plan an event</li> <li>• choose suitable ways to prevent data</li> </ul>
	<p><u>Key Vocabulary:</u></p> <p>labels, groups, objects, properties, record, share</p>	<p><u>Key Vocabulary:</u></p> <p>data, tally chart, total, more than, less than, pictogram, attribute, common, conclusion</p>	<p><u>Key Vocabulary:</u></p> <p>attribute, tree structure, branching database, efficiency, identification tool</p>	<p><u>Key Vocabulary:</u></p> <p>data set, sensors, data logger, intervals, data file, analyse, logged data, interpret, conclusion</p>	<p><u>Key Vocabulary:</u></p> <p>database, record, field, order, sort, group, flat-file database, values, criteria, search tools, chart, filter, refine</p>	<p><u>Key Vocabulary:</u></p> <p>data, spreadsheet, table, input, output, format, cell, formula, cell reference, calculation, duplicate, operation, tools, applications</p>