



Features	
<ul style="list-style-type: none"> • At KS1, the key knowledge is aligned with the National Curriculum and at Carlinghow Academy the following strands feature within our curriculum: • At KS2, the key knowledge is aligned with the National Curriculum's strands of: • Assessment • Developing Experts Knowledge Organisers • Retrieval Challenge Grids 	<div style="text-align: center;">  <p>Skills are reliant upon specific knowledge. A skill the capacity to perform from drawing upon retained knowledge.</p> </div> <div style="text-align: center;">  <p>Children are taught specific vocabulary in line with their topic and the Statutory Spellings of their year group.</p> </div>
National Curriculum	
KS1	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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 • use technology purposefully to create, organise, store, manipulate and retrieve digital content • recognise common uses of information technology beyond school • 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
KS2	<p>Pupils should be taught to:</p> <ul style="list-style-type: none"> • 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 • 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

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	<ul style="list-style-type: none"> • 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. 					
<i>Our Computing concepts</i>	Coding	Computational Thinking	Creativity	Online Safety	Media	Data
Sticky facts threading through our Computing curriculum strands						
<i>Strand</i>	Nursery	Reception	Year 1 Year 2	Year 3 Year 4	Year 5 Year 6	
Coding	I can program simple toys such as a Beebot to move forward and backwards.		Year A Spring 2 <ul style="list-style-type: none"> • I know that a programmable robot can be controlled by inputting a sequence of instructions. • I can develop and record sequences of instructions as an algorithm. • I can program a robot to follow their algorithm. • I can predict how programs will work. • I can debug programs. Year B Spring 1 <ul style="list-style-type: none"> • I can plan a sequence of instructions to move sprites in ScratchJr. • I can create, test and debug programs for sprites in ScratchJr. • I can work with input and output in ScratchJr. • I can use repetition in programs. • I can design costumes for sprites. 	Year A Autumn 1 <ul style="list-style-type: none"> • I can plan and create an algorithm for an animated scene in the form of a storyboard. • I can write a program in Scratch to create the animation, including characters, dialogue, costumes, backdrops and sound. • I can review their animation programs and correct mistakes. Year B Summer 1 <ul style="list-style-type: none"> • I can develop an educational computer game using selection and repetition. • I can understand and use variables. • I can start to debug computer programs. • I can recognise the importance of user interface design, including consideration of input and output. Year B Spring 2 <ul style="list-style-type: none"> • I know about the input – process – output model of computation. • I know about the inputs and outputs available on a BBC micro:bit . • I can program using the MakeCode blockbased environment. • I can test and debug programs they write, using an on-screen simulator and the micro:bit . • I can convert and transfer a program written on screen to the micro:bit. 	Year A Autumn 1 <ul style="list-style-type: none"> • I can create original artwork and sound for a game. • I can design and create a computer program for a computer game, which uses sequence, selection, repetition and variables. • I can detect and correct errors in their games. • I can use iterative development techniques. Year A Spring 2 <ul style="list-style-type: none"> • I know how computers use stored programs to connect input to output. • I know how to generate and evaluate designs in response to a brief. • I can plan a complex project by decomposing it into smaller parts. • I can work with physical components of a system. • I can design and write a program for an embedded system. • I can use criteria to provide others with feedback on their work. Year B Summer 1 <ul style="list-style-type: none"> • I know how speech recognition works. • I know how a neural net recognises images. • I can train a neural net to classify images. • I can train a machine learning system to identify sentiments. 	

			<p>Year B Autumn 2</p> <ul style="list-style-type: none"> • I can develop an appreciation of the links between geometry and art. • I am familiar with the tools and techniques of a vector graphics package. • I can develop an understanding of turtle graphics. • I can experiment with the tools available, refining and developing their work as they apply their own criteria to evaluate it, and receive feedback from their peers. • I can develop some awareness of computer-generated art. 	<ul style="list-style-type: none"> • I can consider some ethical principles in designing AI systems.
<p>Computational Thinking</p>		<p>Year A Autumn 1</p> <ul style="list-style-type: none"> • I can break down a process into simple, clear steps (an algorithm). • I can use different features of a video camera. • I can use a video camera to capture moving images. • I can record a video using ground rules for filming. • I can edit a video to include an audio commentary. • I can develop collaboration skills. • I can discuss their work and think about how it could be improved. <p>Year B Autumn 2</p> <ul style="list-style-type: none"> • I can observe and describe carefully what happens in computer games. • I can use logical reasoning to make predictions of what a program will do and test these. • I can think critically about computer games. • I can create sequences of instructions for a virtual robot to solve a problem. • I can work out strategies for playing a game well. • I can be aware of how to use games safely and in balance with other activities. 	<p>Year A Autumn 2</p> <ul style="list-style-type: none"> • I can develop a number of strategies for finding errors in programs. • I can build up resilience and strategies for problem solving. • I can increase my knowledge and understanding of Scratch. • I can recognise a number of common types of bugs in software. 	<p>Year B Autumn 2</p> <ul style="list-style-type: none"> • I am familiar with semaphore and Morse code • I can understand the need for private information to be encrypted. • I can encrypt and decrypt messages in simple ciphers. • I can appreciate the need to use complex passwords and to keep them secure • have some understanding of how encryption works on the Internet. <p>Year A Autumn 2</p> <ul style="list-style-type: none"> • I can develop the ability to reason logically about algorithms. • I can understand how some key algorithms can be expressed as programs • understand that some algorithms are more efficient than others for the same problem. • I can understand common algorithms for searching and sorting a list.

Creativity		Year A Autumn 2 <ul style="list-style-type: none"> • I know how to select and set brushes and colours. • I can create artwork in a range of styles on iPads. • I can use the undo function if they make mistakes and to encourage experimentation. • I can use multiple layers in their art. • I can transform layers. • I can paint on top of photographs 		
Online Safety	<p>I know that I do not share personal information on-line.</p> <p>I know to tell an adult if I have any concerns about what I see on-line.</p>	Year A Spring 1 <ul style="list-style-type: none"> • I can plan a small multimedia eBook. • I can choose and import images. • I can record audio commentary. • I can add and format titles and other text. • I can think carefully about protecting their privacy. • I can respect other people's copyright. • I can revise and improve my work. Year B Spring 2 <ul style="list-style-type: none"> • I can develop collaboration skills through working as part of a group. • I can develop research skills through searching for information on the Internet. • I can think through privacy implications of their use of search engines. • I can be more discerning in evaluating online information. • I can improve note-taking skills through the use of mind mapping. • I can develop presentation skills through creating and delivering a multimedia presentation. 	Year B Spring 1 <ul style="list-style-type: none"> • I can create a number of structured presentations. • I can create a narrated presentation. • I can consider issues of trust and privacy when sharing information. Year B Summer 2 <ul style="list-style-type: none"> • I can become familiar with blogs as a medium and a genre of writing. • I can create a sequence of blog posts on a theme. • I can incorporate additional media. • I can comment on the posts of others. • I can develop a critical, reflective view of a range of media, including text. 	Year B Autumn 1 <ul style="list-style-type: none"> • I can name and function of components making up the school's network. • I know how information is passed between the components that make up the Internet. • I know what the source code for a web page looks like and how it can be edited. • I know how a website can be structured. • I know how to add content to a web page. Year B Spring 2 <ul style="list-style-type: none"> • I know about appropriate rules or guidelines for a civil online discussion. • I know how search results are selected and ranked. • I know how to argue their point effectively, supporting their views with sources. • I know how to counter someone else's argument while showing respect and tolerance. • I know how to judge the reliability of an online source. • I know some strategies for dealing with online bullying.
Media		Year A Summer 1 <ul style="list-style-type: none"> • I can record audio on a digital device. • I can program sprites to playback recorded audio in ScratchJr. • I can program ScratchJr to create repeating rhythms. • I can explore different effects that can be applied to audio. 	Year A Spring 1 <ul style="list-style-type: none"> • I can develop my web-based research skills. • I can structure, prepare and deliver a talk about a given topic or subtopic studied in another curriculum area. • I can record a piece to camera. • I can edit a movie using static images and green screen footage. 	Year B Spring 1 <ul style="list-style-type: none"> • I can understand the work of architects, designers and engineers working in 3-D • I can develop familiarity with a simple CAD tool. • I can develop spatial awareness by exploring and experimenting with a 3-D virtual environment. • I can develop greater aesthetic awareness.

		<ul style="list-style-type: none"> • I can create a repeating percussion pattern using a virtual drum machine. • I can experiment with a range of virtual instruments. <p>Year B Summer 1</p> <ul style="list-style-type: none"> • I can consider the technical and artistic merits of photographs. • I can use the iPad camera app. • I can take digital photographs. • I can review, reject or pick the image I take. • I can edit and enhance their photographs. <p>Year B Autumn 1</p> <ul style="list-style-type: none"> • I know how animation works. • I can use storyboards to plan an animation. • I can create their own original characters, props and backgrounds for an animation. • I can film, review and edit a stop-motion animation. • I can record audio to accompany their animation. • to provide constructively critical feedback to their peers. 	<ul style="list-style-type: none"> • I can give constructive, critical feedback on recorded presentations. <p>Year A Spring 2</p> <ul style="list-style-type: none"> • I can understand the conventions for collaborative online work, particularly in wikis. • I can be aware of their responsibilities when editing other people's work. • I am familiar with Wikipedia, including potential problems associated with its use • I can practise my research skills. • I can write for a target audience using a wiki tool. • I can develop collaboration skills. • I can develop proofreading skills. <p>Year A Summer 1</p> <ul style="list-style-type: none"> • I can create a repeating percussion rhythm. • I can play music using virtual instruments. • I can compose or edit tunes using the piano roll (pitch and duration) tool. • I can perform electronic music using pre-recorded loops, and create their own loops. • I can create a multi-track composition or performance using multiple instruments. • I can give feedback to others on their compositions and performances. 	<p>Year A Spring 1</p> <ul style="list-style-type: none"> • I know how to plan a non-linear presentation. • I can create text as part of a presentation. • I can add and edit images in a presentation. • I can use hyperlinks for navigation between the slides of a presentation. • I can record and add audio narration to a presentation. • I can use commenting tools to give feedback on a presentation. <p>Year A Summer 2</p> <ul style="list-style-type: none"> • I can explore real-world and imagined locations in VR. • I can create 360° photosphere images. • I can link physical objects to digital content using QR codes. • I can create my own VR scene. • I can program objects and interactions in VR. <p>Year B Summer 2</p> <ul style="list-style-type: none"> • I can manage or contribute to large collaborative projects, facilitated using online tools. • I can write and review content. • I can source digital media while demonstrating safe, respectful and responsible use. • I can design and produce a high-quality print document. <p>Year A Summer 1</p> <ul style="list-style-type: none"> • I can think critically about how video is used to promote a cause. • I can storyboard an effective advert for a cause. • I can work collaboratively to shoot original footage and source additional content. • I can acknowledge intellectual property rights. • I can work collaboratively to edit the assembled content to make an effective advert.
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Data		<p>Year A Summer 2</p> <ul style="list-style-type: none"> • I know how data can be structured as records with fields for information. • I know how data can be organised into groups and subgroups. • I know how data can be structured as a tree. • I know how data can be organised into a table. • I know how data in a table can be filtered and searched. <p>Year B Summer 2</p> <ul style="list-style-type: none"> • I can sort and classify a group of items by answering questions. • I can collect data using tick or tally charts. • I can take, edit and enhance photographs. • I can use Google Sheets or Microsoft Excel to produce basic charts. • I can record information on a digital map. • I can summarise what they have learned in a presentation. 	<p>Year A Summer 2</p> <ul style="list-style-type: none"> • I understand some elements of survey design. • I understand some ethical and legal aspects of online data collection. • I can use the Internet to facilitate data collection. • I can gain skills in using charts to analyse data. • I can gain skills in interpreting results. <p>Year B Autumn 1</p> <ul style="list-style-type: none"> • I understand different measurement techniques for weather – both analogue and digital. • I can use computer-based data logging to automate the recording of some weather data. • I can use spreadsheets to create charts. • I can analyse data, explore inconsistencies in data and make predictions. • I can practise using presentation and video software. 		
Vocabulary threading through our Computing curriculum strands					
<i>Strand</i>	Nursery	Reception	Year 1 Year 2	Year 3 Year 4	Year 5 Year 6
Coding		iPad program Beebot instructions	abstraction algorithm bug code computer debug event input logical reasoning output parallel processing program robot repetition Scratch sprite	abstraction algorithm bug code debug decomposition event iterative development output parallel processing program repetition Scratch sequence sprite storyboard input output	algorithm background bug code debug iterative development logical reasoning program Scratch sprite accelerometer Bluetooth Controller Decomposition Edge connector Embedded System Input LED

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				repeat loop variable accelerometer Bluetooth If/else Javascript LED MakeCode Micro:bit Object code Runtime Simulator Source code Variable	Make Code Micro:bit Microprocessor Output Simulator System artificial intelligence classifier decision tree image recognition label layer machine learning model natural language processing neural network node sentiment analysis spectrogram speech recognition test data training data Watson
Computational Thinking			abstraction algorithm audio computational thinking decomposition edit frame narration pattern storyboard video camera input output parallel processing pattern recognition remix repetition Scratch source code Sprite	Abstraction Algorithm Bug Code Debug Event Input Logical Reasoning Output Parellel processing Program Repetition Scratch Sequence Sprite Variable	Cipher Codes Cryptanalysis Cryptography Decrypt Encode Encrypt Message Morse Code Semaphore Transmit Abstraction Algorithm Binary Search Decomposition Graph Greedy algorithm Linear search Quicksort Search Selection sort
Creativity			Analogue Bitmap Digital Effect		

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			Layer Pixel Stylus Transform Undo Zoom		
Online Safety			Audio Clip Art Creative Commons eBook Filter Images Multimedia Safe Search Speech synthesis Voice dictation Bing Creative Commons DuckDuckGo Filter Google Google custom search Mind map presentation safe search search engine Wikipedia	Comments Creative Commons Data Centre Outline Personal Information Hyperlinks Hypertext mark-up language (HTML) Internet Uniform Resource Locator (URL) Web Server	Creative Commons Hyperlinks Hypertext mark-up language (HTML) Hypertext transfer protocol (HTTP) Internet Internet Protocol (IP) addresses Network Switch Packets of data Protocol Tag Uniform Resource Locator (URL) Web Server Web Browser Anchor tag bias Blog Fake news Hyperlink Neutral point of view Online bullying Plausible Reliable Social media Source
Media			Audio Digital Message Microphone MIDI Piano roll Repetition Sample Sequencer Speaker Sprite Track Virtual adjustment camera roll colour value crop filter	Algorithm Beat sequencer Camera Roll Colour Value Creative Commons Debug Five pillars Green Screen Hyperlinks Hypertext mark-up language (HTML) 'Ken Burns' Live loops MIDI Piano roll Pixel Resolution Rushes Sample	Computer-aided Design (CAD) Creative Commons Photorealistic Render Abstraction Colour Value Hyperlink MP3 Pixel Safe search Accelerometer Augmented reality (AR) Global Positioning System (GPS) Google Cardboard Photosphere QR code Share code Stereographic

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			iCloud JPEG pixel Rule of thirds Sensor animation background character frame flipbook animation media assets onion-skinning prop soundtrack stage stop motion storyboard	Search Engine Stave Touch instruments Tracks Velocity Voice Wiki Wikipedia	Virtual Reality (VR) Creative Commons Desktop publishing (DTP) eBook ePub Folder Image Portable document format (PDF) Text Export Final cut Rough cut Rushes storyboard
Data			database dataset field filter form leaf record sort table tree binary binary tree branching database classification key data geolocation data Global Positioning System pixels tally charts	data data centre data protection digital footprint filter personal information survey analogue dataset digital field form input interface record sensor table	