Copnor Primary School
Being a Computer User

Copnor Primary School's high-quality computing curriculum is planned as a 7-year journey across the Primary School and equips our pupils to use computational thinking and creativity to understand and change the world. Computing has deep links with mathematics, science and design and technology, and provides insights into both natural and artificial systems. The core of computing is computer science, in which our pupils are taught the principles of information and computation, how digital systems work and how to put this knowledge to use through programming. Building on this knowledge and understanding, our pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that our pupils become digitally literate. This means that they are able to use, express themselves and develop their ideas through information and communication technology. This is at a level suitable for the future workplace and as active participants in a digital world.

By the end of Key Stage 1, our pupils will have developed the core skills, knowledge and understanding of computing science, information technology skills and digital literacy to enable them to access the teaching and learning that they will experience in Key Stage 2.

Our pupils are taught to:
• 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

By the end of Key Stage 2, our pupils will build upon the skills, matters and processes that they have learned in Key Stage 1 and develop further skills, knowledge and understanding of computing science, information technology skills and digital literacy to enable them to access the teaching and learning that they will experience in Key Stage 3.

Our pupils are taught to:
• 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
• 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

'Greater Depth' is achieved through a focus on **ACE** – tasks enable pupils to **A**pply, **C**onnect and **E**xplain (or **E**xplore) & **E**valuate

Apply	Pupils have a curiosity to apply computing skills, knowledge and understanding from their current and previous learning. They do so independently and in new or unfamiliar technologies, analytically solving problems and suggesting new ideas.
Connect	Pupils make clear, strong and appropriate connections between their computing skills, knowledge and understanding and use this in a variety of contexts: inquisitive to know more.
Explain & **E**valuate	Pupils are able to explore and combine the taught skills to create individual, innovative and more complex outcomes. They can explain the processes to others and critically evaluate the results of their independent work to assess how effective it is.

	Year 1	Year 2	Year 3
E-Safety	• I can use technology safely • I can identify where to go for help and support when I have concerns about content or contact on the internet or other online technologies • I can recognise acceptable/unacceptable behaviour online • I can understand the importance of communicating safely and respectfully online • I can understand the need for keeping personal information private	• I can keep personal information private • I can use technology respectfully and responsibly • I can identify a range of ways to report concerns about contact • I can understand the importance of communicating safely and respectfully online • I can describe why I need to keep personal information private • I can demonstrate use of computers safely and responsibly • I can describe a range of ways to report concerns	• I can make sensible decisions if content is inappropriate or upsetting • I can explain how the internet contains fact, fiction and opinion • I can explain why we must keep personal information and passwords private when communicating online • I can understand that anyone can create a user account, showing any age or gender • I can create a personal profile • I can tell you how to deal with unpleasant communications via mobile, text, chat rooms • I can describe why you should only befriend people you know and trust never to meet up with "friends" you know only online • I can explain the importance of copyright issues and plagiarism
Computers and networks	• I can recognise obvious uses of IT in and beyond school • I can, with support, save and retrieve my work	• I can understand some of the things that people do with computers at work and at home. I can understand that most computers, tablets and phones are connected to the internet • I can recognise that a range of digital devices can be considered a computer • I can log on to a computer network • I can save and retrieve my work from a shared drive	• I can describe how the internet is a collection of computers (servers) joined together across the world • I can describe the differences between the internet and the world wide web • I can save my work to a variety of locations on the school network, online and locally to a device • I can discuss the reasons for saving in different places
Programming (coding)	• I can give instructions to, and respond to instructions from, other children involving movement around the room • I can describe what I expect to happen while programming a robot • I can talk about how the order is important • I can execute a program and observe the results • I can start to write programs to create movement on-screen	• I can give precise instructions to, and respond to instructions from, other children involving movement around the room • I can describe what actions are needed for a particular task and begin to use the word algorithm • I can understand that a number of different algorithms will often all solve the same problem • I can predict what will happen in an algorithm or program	• I can work with a partner to design, write and de-bug programs that accomplish specific goals • I can begin to solve problems by decomposing them into smaller parts • I can use a sequence in programs • I can begin to work with variables • I can work with various forms of input and output with support • I can begin to use logical reasoning to explain how some simple algorithms work

		• I can understand why algorithms are useful for solving a wide range of problems and that we use algorithms every day • I can describe clearly what I expect to happen while programming a robot • I can execute a program, observe the results carefully spot errors and debug them. I can understand that programs respond to inputs to carry out actions. • I can write programs successfully to create movement on-screen • I can use different kinds of inputs in programming (key press, mouse click tap on a sprite, automated start condition etc.)	

Information Technology (multimedia)	• I can use a painting app to create a picture to communicate ideas • I can use a camera/camcorder to take a picture or record my work • I can begin to edit digital photographs • I can talk about how some apps will enable images to be animated • I can talk about my use of a painting app and my choice of tools in the app	• I can use brush and pen tools, create lines and textures and use the flood fill spray and stamp tools • I can use IT to source, generate and amend ideas for my art work • I can demonstrate good control when using still and video cameras • I can create a sequence of images which together form a short animation • I can describe how an animation is a sequence of still images • I can begin to discuss the quality of my image and make decisions (e.g. deleting a blurred image)	I can use different font effects, layout, format, graphics and illustrations I can use editing tools I can log on to an email account or forum I can recognise key features of different layouts (e.g. poster, newspaper, menu) I can select areas of a painting, copy and paste to make repeating patterns. I am developing greater control over the digital stills video camera and use the enhanced tools I can discuss and evaluate the quality of my captured images and make decisions I can create a short animated sequence I can capture "footage" from different devices into simple movie editing software. I can add simple titles and credits, music and narration.
Information Technology (data handling)	• I can enter text into a search engine to find specific given web sites • I can understand that the internet gives rapid access to a wide variety of information and resources • I can talk about my use of the internet and compare with other ways of finding information • I can talk about how my information can be used to answer specific questions • I can develop simple classification skills by carrying out simple sorting activities (probably away from the computer) • I can sort and classify a group of items by asking simple yes / no questions • I can talk about the different ways technology can be used to collect information (e.g. camera, microscope or sound recorder) • I can begin to interpret simple graphs, discuss the information they contain and answer simple questions about them	• I can use appropriate buttons, menus and hyperlinks to navigate web sites for stored information I can locate specific sites by typing a website address (URL) into the address bar in a web browse • I can understand that different forms of information (text, images, sound, multimodal) exist and that some are more useful than others for specific purposes • I can begin to develop key questions to help find information • I can be responsible when using the internet • I can use simple graphing programs to produce pictograms and other simple graphs I can use graphing software to change the way a graph type (eg pictogram to bar chart) I understand that IT can be used to sort items and information I understand that IT can be used to create, display and change graphs quite easily I am beginning to understand that if data has not been entered accurately it cannot be used to provide correct answers to questions	• I can begin to develop key questions and key words to search for specific information • I can use information with increasing purpose to complete specific tasks • I can use search engines • I can describe how a website has a unique address • I can explain that some information found through searching is more relevant than others • I can collect appropriate information, enter it into a database or spreadsheet • I can generate and compare different charts and graphs I can begin to explain how different graphs are used for different purposes • I can organise, present, analyse and interpret the data in tables, tally charts, charts / graphs • I can begin to develop skills to identify what data needs to be collected • I can change the contents of cells in a spreadsheet • I can use a spreadsheet to record data • I can use a spreadsheet to explore simple patterns

	Year 4	Year 5	Year 6
E-Safety	• I can evaluate my decisions if content is inappropriate or upsetting • I can explain how the internet contains fact, fiction and opinion and begin to distinguish between these. • I can describe online marketing and begin to develop strategies to deal with it • I can explain in detail why we must keep personal information and passwords private when communicating online • I can explain that online communication is not always confidential and that it can be monitored • I can explain how anyone can create a user account, showing any age or gender • I can make decisions about when an email should not be opened or a message ignored. I can tell you how to deal with unpleasant communications • I can explain how taking text or images from some sites may be stealing other people's work	• I can explain how some internet material is age related I can demonstrate safe practice when selecting images or content for uploading to a personal profile • I can explain how some malicious adults use the internet to make contact and groom young children. • I can explain how to report any suspicions (CEOP report abuse page) • I can explain the differences between public social networking sites and closed learning environments • I can explain the purpose of passwords and that passwords should never be shared • I can explain the importance of appropriate online behaviour and that online bullying is unacceptable • I can explain why it is important to create a positive "digital footprint"	• I can explain how some internet material is age related and the implications for ignoring such guidance. • I can demonstrate safe practice when selecting images or content for uploading to a personal profile • I can explain how some malicious adults use the internet and how to report • I can explain the differences between public social networking sites and closed learning environments • I can discuss the purpose of passwords and that passwords should never be shared • I can explain why online bullying is unacceptable. • I can explain why it is important to create a positive "digital footprint" • I can check for copyright when downloading content from the internet
Computers and networks	• I can describe the basic structure of the school network (printers, internet etc.) • I can understand the function of different externally visible parts of a computer (and peripherals) • I can classify devices as an input or an output device	• I can describe the different services internet provides (e.g. email, www) • I can describe how information is passed around the internet. • I can describe the functions of and terminology around web browsers and search engines • I can describe the difference between physical, wireless and mobile networks	• I can explain the different services internet provides (e.g. • email, www, file transfer, video conferencing etc.) • I can explain how information is passed around the internet • I can explain how search results are selected and ranked by search engines • I can describe the function of an operating system and be able to name some. I can explain the difference between physical, wireless and mobile networks • I can describe how data is stored (e.g. binary code)

| Programming (coding) | • I can design, write and debug programs that accomplish specific goals
• I can solve problems by decomposing them into smaller parts
• I can confidently use a sequence in programs
• I can use repetition in programs
• I can work with variables
• I can confidently work with various forms of input and output
• I can use logical reasoning to explain how some simple algorithms work and to detect and correct errors in algorithms and programs | • I can begin to explain and program each of the steps in my algorithm
• I can review and amend the original algorithm while programming
• I can deconstruct a problem into smaller steps, recognising similarities to solutions used before
• I can recognise when a variable is needed to achieve a required result
• I can program a sprite to add to the score on a certain action
• I can use different inputs (including sensors) to control a device or onscreen action and predict what will happen
• I can begin to evaluate the effectiveness and efficiency of an algorithm, continually testing the programming of that algorithm
• I can recognise there are different algorithms for the same problem
• I can write programs that include a variable (e.g. a scoring system in a game)
• I can designs algorithms and programs that use repetition | • I can explain and program each of the steps in my algorithm
• I can carefully review and amend the original algorithm while programming
• I can talk about how a computer model can provide information about a physical system
• I can decompose a problem into smaller parts to design an algorithm for a specific outcome and use this to write a program for a device or onscreen activity I can evaluate the deconstruction of a problem into smaller steps to seek solutions to a problem
• I can investigate more blocks – make a block to create more commands for actions that repeat in a program
• I can recognise when a variable is needed to achieve a required result.
• I can confidently program a sprite to add to the score on a certain action
• I can use different inputs (including sensors) to control a device or onscreen action and predict, with confidence, what will happen
• I can use logical thinking, imagination and creativity to extend a program
• I can evaluate the effectiveness and efficiency of an algorithm, continually testing the programming of that algorithm
• I can link errors in a program to a problem in the algorithm on which it is based
• I can write programs that include multiple variables (e.g. a scoring system in a game)
• I can suggest tasks best completed by humans and those for computers |

| Information Technology (multimedia) | • I can use different font effects, layout, format, graphics and illustrations to communicate for a given audience
• I can use appropriate editing tools to ensure my work is clear and error free I can log onto an email account or forum
• I can open emails, create and send appropriate replies and use attachments
• I can recognise key features of different layouts and consider how to meet the needs of the audience (e.g. poster, newspaper, menu)
• I can select areas of a painting and copy and paste to make repeating patterns
• I can resize elements
• I can investigate reflection tools
• I can develop greater control over the digital stills video camera and use the enhanced tools
• I can discuss and evaluate the quality of my own and others' captured images and make decisions
• I can create a short-animated sequence from captured images
• I can capture "footage" from different devices into simple movie editing software
• I can add simple titles and credits, music and narration I can use IT to select and record voice and sounds
• I can select, import and edit existing sound files
• I can use music software or an app to experiment with capturing, repeating and reordering sound patterns
• I can use music software / app to create a simple multipart percussion composition
• I can use IT to begin to create and perform sounds or music that would otherwise not be possible live e.g. playing a multi-part piece or a very fast piece | • I can format and edit work to improve clarity and mood
• I can, with increasing independence, create, send and respond to email, blogs and forums
• I can produce formal or informal e-messages appropriate to a task or to solve problems
• I can begin to develop my use of hyperlinks to produce more effective interactive, nonlinear presentations
• I can, with some support, select and import sounds from my own recording, create my own effects and music and import from other sources
• I can create images using an increasing range of techniques
• I can make decisions to capture, store, retrieve and edit digital images for a particular purpose
• I can, with some support, plan and create a short-animated sequence to communicate a specific idea, using a storyboard and timeline with some support
• I can, with some support, combine stills, video and sound, using a video editing package
• I can make use of transitions and special effects when editing films and understand the effect they will have on the audience
• I can develop skills in manipulating sounds
• I can independently select and use a variety of appropriate devices to record musical and non - musical sounds
• I can create my own sounds and compositions to add to my work
• I can use IT to perform sounds or music that would otherwise not be possible live
• I can use IT to produce music for a specific purpose, considering the impact on the audience | • I can confidently format and edit work to improve clarity and mood
• I can independently create, send and respond to email, blogs and forums
• I can produce a range of formal or informal e-messages appropriate to a task or to solve problems
• I can talk about different forms of electronic communication, their appropriateness to tasks, advantages and disadvantages
• I can explain how pages are linked together and recognise the need for clarity
• I can develop my use of hyperlinks to produce more effective interactive, nonlinear presentations
• I can make effective use of transitions and animations and consider the effect on the audience and appropriateness
• I can select and import sounds from my own recording, create my own effects and music and import from other sources
• I can create images using a range of techniques
• I can make confident decisions to capture, store, retrieve and edit digital images
• I can explain the difference between object based graphic packages and paint packages
• I can independently plan and create a short-animated sequence to communicate a specific idea, using a storyboard and timeline.
• I can combine stills, video and sound using a video editing package
• I can independently make use of transitions and special effects when editing films and understand the effect they will have on the audience
• I can make images and movies in a variety of formats, understanding some of the differences, and share on the internet (with due regard for safety) |

	• I can understand that copyright exists on most recorded music	• I can explain why copyright should be respected when selecting music samples	• I can independently select, edit and combine sound files from internet sources to create a podcast file • I can develop skills in manipulating sounds I can independently select and use a variety of appropriate devices to record musical and non - musical sounds • I can upload and download projects to the virtual learning environment (VLE) • I can competently create my own sounds and compositions to add to my work • I can use IT to produce music for a specific purpose, considering the impact on different audiences • I can explain, with clear reasoning, why copyright should be respected when selecting music samples
Information Technology (data handling)	• I can develop key questions and key words to search for specific information • I can use information purposefully to complete specific tasks • I can understand the dynamics of search engines • I can use search engines with increasing efficiency • I can describe the process of finding specific information • I can collect appropriate information, enter it into a database or spreadsheet and use this to answer simple questions • I can generate and compare different charts and graphs using different applications • I can explain that different graphs are used for different purposes • I can organise, present, analyse and interpret the data in tables, tally charts, charts / graphs, using IT where appropriate • I can begin to identify what data needs to be collected and design a questionnaire or survey to aid its collection • I can change the contents of cells in a	• I can start to use strategies for finding information efficiently • I can consider the effectiveness of search results • I can skim and select information, checking for bias and different viewpoints • I can recognise the possible impact of using incorrect data • I can modify a search pattern in order to find specific information • I can check for accuracy by checking data, using different views, search tools, and graphing • I can identify and correct inaccuracies in my data/information • I can solve complex enquiries, involving selecting, processing, and presenting data • I can draw conclusions from the process • I can construct, refine and interpret frequency tables; bar charts with grouped discrete data; line graphs; and interpret pie charts	• I can use strategies for finding information • I can consider the effectiveness of search results and refine where necessary • I can skim and select information, evaluating its potential bias and different viewpoints • I can talk about validity, plausibility and appropriateness of information, especially on the internet • I recognise the impact of using incorrect information in my work • I can evaluate the possible impact of using incorrect data • I can use complex searches (and/or, is greater/less than) to search data when looking for relationships and patterns in data • I can evaluate a search pattern when finding specific information • I can check for accuracy by checking data, using different views, search tools, and graphing • I can identify and correct inaccuracies with increasing efficiency • I can solve complex enquiries involving selecting, processing, and presenting data and draw conclusions from the process

		I can begin to enter formulae into a spreadsheet and modify the data (simple calculations + - × ÷)	I can independently construct, refine and interpret frequency tables; bar charts with grouped discrete data; line graphs; and interpret pie charts
	spreadsheet to explore "What if …" questions • I can use a spreadsheet to record data and produce graphs • I can use a spreadsheet to explore simple patterns (e.g. in a number square) • I can recognise the need to structure information properly in a database or spreadsheet • I can understand and use the vocabulary file, record, field, data and information		• I can enter formulae into a spreadsheet and modify the data, (simple calculations + - × ÷) • I can make predictions and changes and check results

Glossary

Algorithms - a set of instructions to achieve a desired goal e.g. how to make a sandwich successfully or baking a cake by using a precise method.

Debugging - finding errors within a sequence of events or code and putting them right for a desired end, e.g. to make a computer-generated pen draw a square on the screen, the turns must be through right angles (90 degrees, not 45 or 60 etc.)

Decomposing - breaking a process or program down into smaller separate steps e.g. building a house is made up of different steps by laying the foundations, building the walls and putting on the roof etc.

Repetition - the repeating of a set of instructions over and over again, such as a daily routine which is repeated every day during the course of a school week. E.g. Wake up, get dressed, have breakfast, go to school, learn and come home etc.

Selection - an essential part of programming whereby a choice is made if something happens. E.g. If it rains, then you put on a raincoat.

Sequencing - putting a series of events in the correct order to ensure a desired outcome e.g. spreading butter on a slice of bread before adding the filling.

Sprite - a character within the 'Scratch' app.

Variables - 'containers' which are used to store information within a program e.g. the score box in a quiz.