CAPTAIN WEBB PRIMARY SCHOOL

Computing Curriculum – Key Knowledge and Skills

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computing					
Computer Systems and Networks					
Knowledge **I know that technology is something that is man-made that can help us.** I know what a mouse and keyboard are and what they do. I know that a mouse can be clicked and dragged across a screen. I know how technology can be used inside of school. Skills I can use a mouse to drag and drop an object on screen. I can click and drag a mouse across a screen to create an image. I can type my name and other words into a Text Box using a keyboard. I can type sentences into more than one text box. .	Knowledge **I know that information technology is anything that is a computer, has a computer inside or works with a computer.** I know how information technology is used in different ways in the local area and in the home. I know that a barcode contains a code that can be read very quickly by a computer. Skills . I can use a barcode to look up the price of different items in a shop. I can list ways to take a digital photograph safely and responsibly.	Knowledge **I know that digital devices involve an input, process and output.** I know the main inputs and outputs for a range of common digital devices. I know that computer networks can be used to share information. **I know the role of a switch, server, and wireless access point in a network.** I know which network devices are around me in school and at home. Skills I can follow an input, process, output process. I can demonstrate how information can be passed between devices on a wireless network. I can demonstrate how devices in a network are connected with one another	Knowledge **I know that the internet is a network of networks.** **I know that the World Wide Web is part of the internet that contains websites and web pages.** **I know that websites on the World Wide Web are accessed by using a Browser.** I know that anyone can add content to the World Wide Web. Skills I can use a tracerouter tool to find out the route a webpage travels when I access it. I can create media which can be added to a website on the World Wide Web.	Knowledge: **I know the five main parts of a computer system.** I know how the main parts of a computer system work together to achieve tasks. **I know that internet protocols such as IP address and packets can be used to transfer data in large computer systems.** I know that connected digital devices can allow us to access shared files stored online. Skills I can describe how the parts of a computer system for a shopping locker work together. I can send information over the internet in different ways when working collaboratively. I can compare working online with working offline.	Knowledge **I know that search terms are used in search engines to find specific information on the internet.** **I know that search engines use bots to index the World Wide Web.** **I know that search engines use 'selection' and 'page rank' to order search results.** I know that that there are a variety of ways of communicating effectively and responsibly over the internet. Skills I can refine a web search and compare results from different search engines. I can relate a search term to the search engine's index. I can explain how search engines make money.
Technology, click, drag, object, text, text box.	Information technology, computer, data, digital information	Input, process, output, network, switch, server, wireless access point (WAP)	Internet, network, World Wide Web (WWW), web page, browser	Computer system, Input, Processing, Storage, Output, internet protocol, IP address, packets	Search term, search engine, bot, crawler, index, selection, page rank

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Computing Curriculum – Key Knowledge and Skills

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computing					
Creating Media – Digital Images					
Knowledge **I know that paint tools make marks and draw lines.** I know the function of the shape and line tools. I know that colour, size and thickness of a paint tool can be changed. Skills I can use paint tools to draw a picture. I can use shape and line tools to recreate Mondrian's artwork. I can select from a variety of tools to recreate Matisse's artwork. I can identify the differences between digital images and non-digital images. .	Knowledge **I know how that a range of devices can be used to capture a digital image.** I know that format, composition and light can be used to effect of a digital photograph. . **I know that a digital image can be changed using simple software tools such as cropping and filters..** Skills . I can use a digital device to take a photograph. I can take digital photos in both portrait and landscape formats, experiment with object composition and use different light sources. I can use simple digital tools such as cropping and filters to manipulate a digital photograph. I can identify photographs that have been digitally altered.	Knowledge I know that digital animations are made with a sequence of still digital images. I know that small changes between frames are needed for a stop frame animation. I know that a stop frame animation can be organised in sequence using a storyboard. I know that media and effects (such as music and text) can be used to improve a digital stop frame animation. Skills I can use onion skinning to make small changes between frames. I can create an effective 2D stop-frame animation using digital images. I can add digital audio and digital text into a stop frame animation.	Knowledge I know some reason why digital images are changed or edited. **I know how some digital images can be changed or edited using composition tools, colour tools and light tools.** **I know that parts of two different images can be combined to make a fake image using the clone stamp tool.** I know that adding other elements to an image can improve my work. Skills I can change the composition of an image by selecting parts of it. I can choose effects to make my image fit a scenario. I can choose appropriate tools to retouch an image using the clone stamp tool. I can combine parts of two different images to create new images using the clone stamp tool.	Knowledge **I know that vector drawings do not lose resolution when scaled and are made using lines and shapes.** I know that each element added to a vector drawing is an 'object'. I know that each added object creates a new layer in a vector drawing. . I know parts of a vector drawing can be copied by grouping and duplicating several objects. Skills I can move, resize, colour, rotate and copy objects to create a vector drawing. I can change the order of layers in a vector drawing. I can group objects to create a single vector drawing.	Knowledge **I know how computer software can be used to model 3D shapes from the real world.** I know that a digital 3D object can be modified by resizing, lifting or changing colour. I know where the rotate, position and duplicate tools are and how to use them to manipulate 3D objects. I know that a placeholder shape can be used to create a hole in a 3D object. Skills I can select, move, and delete a digital 3D shape. I can rotate position and duplicate 3D objects in relation to each other. I can use 3D shapes as placeholders. I can use software to create a digital 3D model of a photo frame that fits a given design criteria.
Brush, pen, shape tool, line tool, paint tool, fill tool	Digital photograph, portrait, landscape, crop, filter	Animation, stop motion, frame, onion-skinning	Crop, rotate, flip, filter, colour balance, hue, saturation, sepia, vignette, clone stamp	Vector, scaling, resolution, grouping, duplicating	Digital model, resize, lift, rotate, position, duplicate, placeholder

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Computing Curriculum – Key Knowledge and Skills

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computing					
Creating Media – Audio / Video / Desk Top Publishing					
Digital Typing Knowledge **I know the function of the letter keys and some of the non-letter keys on a keyboard.** **I know that letters can be changed to capital letters, bold, italic and underlined using the keyboard and toolbar.** I know that text can be selected in different ways. I know that the undo tool goes back a step in the word processing tools I have used. Skills I can type text into a word processor and use the cursor backspace and space keys. I can use the key board and toolbar to change the letters I have typed. I can double click, and click and drag, to select text. I can use the undo tool when I have made a mistake.	Digital Audio Knowledge **I know that digital tools can be used to create musical rhythms in sequence.** **I know that I can change the pitch and duration of a sound with digital tools.** I know that a computer can be used to make a musical pattern of notes. I know that computers can be used to combine rhythms and melodies. Skills I can use digital tools to create a sequence of rhythmical beats. . I can use a computer to compose a sequence of notes. I can use a computer to compose a piece of music that represents an animal.	Desktop Publishing Knowledge I know how digital text and images are used to communicate clearly. **I know how the 'return' 'shift' keys are used to add line breaks and punctuation to text.** **I know what a placeholder is and why it is important.** **I know that content can be added to a placeholder.** **I know that different publishing layouts and style choices have different effects on the audience.** I know some uses of desktop publishing in the real world. Skills I can create line breaks and type punctuation using the 'Return' and 'Shift' keys. I can change font style, size and colour for a given purpose. I can create a template for a particular purpose using placeholders.	Podcasting Knowledge **I know that there are input and output devices that can play audio, record sound, or do both in digital formats.** **I know that computer software can be used to record and save digital audio.** **I know that digital audio can be changed through editing, by changing the volume or fading it in and out.** **I know that different types of audio can be combined together and played together.** I know that digital recordings need to be exported so they can be listened to on a range of digital devices. Skills I can plan, record and arrange the elements of audio in a podcast. I can edit sections of an audio recording. I can export an audio file.	Digital Video Knowledge I know that digital video is a visual media format and recognise some production and editing techniques. I know a range of different digital filming techniques for different purposes. **I know that video can be imported into video editing software so that it can be edited using, split, trim. Clip and edit tools.** I know that video clips can be reordered in video editing software. Skills I can capture digital video using a range of filming techniques. I can select the correct tools to make effective edits to digital video. .	Web Publishing Knowledge **I know that websites are written in HTML.** **I know the common features of a webpage.** I know that a preview will show me what my webpage will look like when it is published. **I know what a navigation path is.** **I know what a hyperlink is and the implication of linking content owned by other people to my website.** Skills I can plan a webpage layout that suits my purpose. I can add content to my own web page. I can make multiple web pages and link them using hyperlinks. I can create hyperlinks to link to other peoples' work.
Cursor, key, backspace, space, toolbar, bold, italic, underline, undo, double click, click and drag, select	Sequence, pattern, digital manipulation	Desktop publishing, return, shift, line break, font style, font size, placeholder	Podcast, audio, microphone, speaker, volume, fade	Close up, mid-range, long shot, static, zoom, pan, tilt, split, trim, clip	HTML, logo, layout, header,, breadcrumb trail, hyperlink, subpage

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Computing Curriculum – Key Knowledge and Skills

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computing					
Data and Information					
Knowledge I know that objects can be put into groups. I know that grouping objects can help data be counted. **I know that an object can be labelled according to its properties.** **I know that similar objects can have more than one property that can be the same or different.** I know that comparing objects means finding what is the same and what is different. **I know that questions can be used to find groups of objects or objects within groups**. Skills I can describe a property of an object using a label. I can group similar objects in more than one way. I can decide how to group objects to answer a question	Knowledge I know that data can be used to make a pictogram on a computer. **I know what an attribute is.** **I know that a common attribute can be used to group objects.** **I know that it is important to choose a suitable attribute to compare things.** I know that computers can be used to present data in different ways. Skills I can add data on to a computer to make a pictogram. I can create a pictogram to arrange objects by an attribute. I can collect suitable data to answer a question. I can present data in different graphical formats using a computer.	Knowledge **I know that two groups of objects can be separated with a yes/no question.** **I know that attributes can be used to separate objects into branching groups.** **I know that objects can be put into a branching database using computer software.** I know that questions in a tree structure need to be carefully organised. I know that pictograms and branching databases show information in different ways. Skills I can group objects using my own yes/no questions. I can create yes/no questions using given attributes. I can use my branching database to answer questions. I can compare the differences between pictograms and branching databases	Knowledge I know that a data set can answer a given question. **I know that sensors on a data logger are devices that can input data.** **I know that a data logger can record different types of data.** **I know that data sets can be imported to a computer to view, analyse and organise.** I know that logged data can be interpreted to answer specific questions. Skills . I can use data from a sensor to answer a given question. I can set appropriate intervals on a data logger to collect data. I can draw conclusions from the data that I have collected using a data logger.	Knowledge: **I know that information can be recorded in fields.** **I know what a field and a record is in a database.** I know how information can be grouped to answer questions. **I know how 'AND' and 'OR' can be used to refine data selection.** I know that a chart can be refined by selecting a particular filter. I know that some questions will need more than one field to answer them. Skills I can create multiple questions about the same field e.g. true or false, more than or less than. I can choose which field and value are required to answer a given question. I can select an appropriate chart to visually compare data. I can refine a search in a real-world context.	Knowledge I know that a spreadsheet can be used to structure data. **I know that a cell in a spreadsheet can be formatted for different types of data.** **I know which data types can be used in calculations.** **I know that data can be calculated using different operations.** I know why data needs to be organised in a spreadsheet. I know the benefits of both tables and charts and can choose which is best for different scenarios. Skills I can choose an appropriate format for a cell in a spreadsheet. I can construct a formula in a spreadsheet. I can create a formula which includes a range of cells. I can apply a formula to calculate the data I need to answer questions. I can use a chart to show the answer to questions.
Object, group, properties, label	Data, , attribute, common attribute	Attribute, branching groups, branching database, tree structure	Data set, sensor, data logger, continuous data	Database, data, field, record, refine, value	Spreadsheet, data, format, cell, formula

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Computing Curriculum – Key Knowledge and Skills

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computing					
Programming A					
Knowledge **I know that an outcome is the result of a command.** **I know that commands need to be in order for them to have the right outcome.** I know that different sequences of commands can start from the same place. I know that a floor robot can be controlled with left, right, forwards and backwards commands. **I know that when a program does not work I have to debug it.** I know that more than one program can solve the same problem in different ways. Skills I can predict the outcome of a command on a device. I can experiment with turn and move commands to move a robot. I can choose the order of commands in a sequence. I can use two different programs to get to the same place with a floor robot.	Knowledge **I know that an algorithm is a set of commands in order.** I know that the same instructions can be used to make different algorithms. I know that predicting the outcome of an algorithm can help to make sure the instructions and sequence is accurate. I know that design in programming includes artefacts such as artwork as well as code and algorithms. **I know how to create an algorithm to meet a goal.** I know how to plan algorithms for different parts of a task. Skills I can use an algorithm to program a sequence using a floor robot. I can use my algorithm to create a program that achieves an outcome I have been given. I know how to plan algorithms for different parts of a task.	Knowledge I know the different objects in a Scratch project and their attributes. **I know that program design is used to plan algorithms.** I know that a program can be started in different ways. **I know what a sequence of commands is and why it is sometimes, but not always, important.** I know that a task description relates to the design of the algorithm. Skills I can create a program following a design. I can create a sequence of connected commands. I can apply the concept of design to write a program to create a digital musical instrument.	Knowledge I know that I can change the effect of a 'Forward' or 'Turn' command in Logo by changing its value. I know that Logo commands can be used to write algorithms. **I know that a count-controlled loop can be used to create shorter sections of a program.** **I know that tracing code is a way to predict the outcome of an algorithm.** **I know that a procedure is a small section of a program that performs a specific task.** I know that a program can be developed by debugging it. Skills I can write an algorithm using Logo commands to draw a letter. I can use a count-controlled loop to draw shapes using Logo. I can predict the outcome of a program containing a count-controlled loop by code-tracing. I can repeatedly call a procedure in a program to create a pattern using shapes. I can design, make and debug a program using Logo.	Knowledge: **I know what an infinite loop does in a program.** **I know that a count-controlled loop can be used to control a physical output (e.g. a motor)** **I know that a condition in a conditional loop is either true or false.** **I know that a condition being met in a 'if… then' statement' can start an action.** Skills I can program a microcontroller to make an LED switch on. I can design a conditional loop. I can use selection (an 'if…then…' statement) to direct the flow of a program. I can use selection to produce an intended outcome.	Knowledge **I know some examples of information that is variable.** **I know that a variable has a name and a value.** **I know that I can use an event in a program to set a variable.** **I know how to choose a name that identifies the role of a variable.** Skills I can use variables to create a simulation of a scoreboard in a computer game.
Outcome, command, order, sequence, debug	Algorithm, command, order, sequence, artefacts, task	Attribute, program design, algorithm, sequence, task description	Command, algorithm, count-controlled loop, code-tracing, procedure	Selection, infinite loop, count-controlled loop, conditional loop	Variable, name, value, event

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Computing Curriculum – Key Knowledge and Skills

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computing					
Programming B					
Knowledge **I know that commands can move an object.** **I know that more than one programming block can be joined together.** I know that some programming blocks have numbers. I know that I can add programming blocks to an algorithm Skills I can create an algorithm for more than one sprite in a project. .	Knowledge **I know that a program needs to be started for it to begin.** **I know that a sequence of commands has an outcome.** I know that I can predict the actions of a sprite by looking at an algorithm. Skills . I can change the outcome of a sequence of commands. I can predict the actions of a sprite in an algorithm. I can create an algorithm to create a quiz. I can debug my program.	Knowledge **I know what an action and an event is.** **I know what program extensions are and how to use them.** I know what a pen block is and how it can be used. Skills I can use program extensions to set up my program. I can build more sequences of commands to make my program design work. I can design and create my own project to move a sprite around a maze with a pen trail to show where it has been.	Knowledge I know what a count controlled loop is. I know what an infinite loop is. I know which parts of a loop can be changed. Skills I can create a snippet of code with a count-controlled loop. I can choose when to use a count-controlled and an infinite loop. I can use repetition to create a simple animation. I can use repetition when designing code for a computer game.	Knowledge: **I know how 'if… conditions' are used to control the flow of actions in a program.** **I know that an 'if… then… else….' statement can be used for selection.** **I know how the 'if… then... else…' structure can be used to identify two responses to a binary question (one with a 'yes or no' answer).** Skills I can modify a condition in a program. I can use an 'if… then… else….' statement in an infinite loop to check a condition. I can design the flow of a program which contains 'if… then... else…' I can use selection to control the outcomes in an interactive quiz.	Knowledge **I know some examples of conditions in the real world that can be used as a variable.** **I know that a condition can be used to change a variable.** **I know that the order of conditions in if, else, then statements affects the sequence of a programme.** Skills I can use a variable in an 'if, then, else' statement to select the flow of a program. I can use a condition to change a variable. I can use an operand (e.g. <>=) in an if, then statement. **I can write a program to control a micro:bit using sequence, repetition, selection and variables.**
Command, object, algorithm	Program, algorithm, sequence, outcome, debug	Action, event, program extension, sequence, command	Count-controlled loop, infinite loop, code snippet, repetition	Selection, condition, 'if' conditions, 'if… then… else' conditions, binary question	Sequence, repetition, selection, variables.