



Captain Webb Knowledge Document

Teach Computing Curriculum – Progression

This document outlines the declarative and procedural knowledge linked to the [Teach Computing Units](#) to show the progression through the year group units.

Note that the Teach Computing curriculum is updated regularly and, ergo, this progression document may need to be altered to reflect these changes.

The full Learning Graphs can be accessed for each unit on the Teaching Resources sections of the Teaching Computing website.

The document is split into declarative and procedural knowledge.

Declarative knowledge (sometimes known as conceptual knowledge) refers to rules, facts or principles and the relationship between them. Can be described as ‘knowing that.’

Procedural knowledge is the knowledge of methods or processes that can be performed, often described as ‘knowing how.’

The document also highlights key vocabulary for each unit. Please see full vocabulary lists on the [Teach Computing Curriculum](#) page.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computing					
Computer Systems and Networks					
Technology Around Us	IT Around Us	Connecting Computers	The Internet	Systems and Searching	Communication and Collaboration
<p>I know how technology helps us. I know that a computer is an example of technology. I understand that choices are made with technology, and this is why rules are important.</p> <p>I can choose a piece of technology to do a job, recognising that technology can be used in different ways. I can identify and use parts (including a mouse and keyboard) of a computer. I can show how to use technology safely and responsibly.</p>	<p>I know the different types of computers used in school. I know that a computer is part of Information Technology. I understand the term Information Technology and know different forms of IT. I know the uses and rules of different forms of IT. I know the benefits of using IT</p> <p>I can describe uses of IT I can identify IT in school and beyond. I can show others how to use IT safely and responsibly</p>	<p>I understand the terms 'input and output' linked to computers and how they are linked to the process. I understand how devices in a network are connected to one another. I understand how information is passed through multiple connections on a network. I know the benefits of computer networks.</p> <p>I can identify input and output devices and explain the processes they do. I can identify network devices around me and how they connect to one another. I can explain how switches, servers and wireless access points can be used in a network to share information.</p>	<p>I understand how networks connect and communicate with each other and that together, the global interconnection of networks make up the Internet. I know that the World Wide Web (WWW) is a collection of websites and web pages, and that the Internet enables us to view these. I understand that WWW content can be created by anyone and shared with everyone. I understand the limitations, reliability and benefit of the World Wide Web and its content.</p> <p>I can describe what the Internet is, and how devices physically connect. I can explain what the World Wide Web is, and the difference between it and the Internet. I can explain the different types of content that can be created for the WWW and evaluate its reliability, the usefulness of content created, and the consequences of unreliable content</p>	<p>I understand that a computer system is a collection of inputs, processes and outputs, and how they play a role in our lives. I understand that there are a number of search engines (a type of system) and I know how search results are found, ordered and 'ranked.' I understand why the order of results is important, and to whom, and understand some of the limitations of search engines.</p> <p>I can compare different search engines and explain why search results might be different, when searching for the same thing. I can evaluate the results of search terms and identify that results from search engines can include adverts, and that the adverts can be targeted at specific audiences.</p>	<p>I understand that computers have protocols and rules to follow, so that information can be shared over the internet, using 'packets' of information. I can understand the benefits of computer systems in our lives and how they enable collaborative projects. I can define 'communication' and discuss the opportunities that technology offers for communication.</p> <p>I can identify different ways to communicate using technology and evaluate different methods of online communication effectively. I can identify what you should and should not share online.</p>
Key Vocabulary: technology, computer, mouse, trackpad, keyboard, screen, double-click, typing.	Key Vocabulary: Information technology (IT), computer, barcode, scanner/scan	Key Vocabulary: Network, data, server, wireless access points (WAPs), network switch, router, input, process, output, Wi-Fi, Bluetooth.	Key Vocabulary: Network, data, World Wide Web, Internet, web page, website, content, media, copywrite.	Key Vocabulary: Address bar, search box, World Wide Web, search engine, web crawler, page rank, ranking, communication, search terms.	Key Vocabulary: communication, protocol, data, address, Internet Protocol (IP), Domain Name Server (DNS), packet, header, data payload, chat, explore, slide deck, reuse, remix, collaboration, internet, public, private, oneway, two-way, one-to-one, one-to-many.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computing					
Creating Media A					
Digital Painting	Digital Photography	Stop Frame Animation	Audio Production	Video Production	Web Page Creation
<p>I know that computer can be used to create art.</p> <p>I know what the different freehand tools do on the chosen application.</p> <p>I understand how to adjust a tool to suit my needs, deciding on the appropriate tool for use and considering the impact of my choices.</p> <p>I understand the differences between painting on a computer to using brushes.</p> <p>I can create a picture using freehand tools, shape and line.</p> <p>I can use a range of paint colours and use the fill tool when needed.</p> <p>I can use the undo button to correct a mistake.</p>	<p>I know that some digital devices can capture images using a camera.</p> <p>I know how to take and save/store a photograph for future viewing.</p> <p>I know the features of a good photograph and how one could be improved.</p> <p>I understand how light can affect a photograph.</p> <p>I know that some photos are not accurate.</p> <p>I can capture a digital image, in either landscape or portrait mode.</p> <p>I can use the zoom on the camera to change the composition of the photos and consider the use of light before taking my photo.</p> <p>I can use filters to edit the appearance of the photo.</p>	<p>I know that an animation is made up of a sequence of images.</p> <p>I know that different apps/software can be used to create animation.</p> <p>I understand that devices used to create animations must be in a fixed position.</p> <p>I know that smaller movements in image placements creates smoother animations.</p> <p>I understand the term 'onion skinning' and how this can help to produce successful animations.</p> <p>I understand the term 'export' and know how animations can be exported to be viewed.</p> <p>I can plan, record and edit an animation.</p> <p>I can use a range of tools such as onion skinning, reviewing and deleting scenes to improve an animation.</p> <p>I can add further media to enhance an animation such as titles, background music and effects.</p>	<p>I know that sound can be recorded digitally and stored as a file, and can demonstrate ways to do this.</p> <p>I know that digital audio can be edited and altered, and can demonstrate some ways to do this.</p> <p>I know the range of editing choices available, and understand their effects on finished media and its intended audience.</p> <p>I can use Audacity to record sound digitally, using a device with a microphone and save it as an audio file, and locate the file again.</p> <p>I can use Audacity to play back, select, edit and alter an audio file, and understand what layering sound means.</p> <p>I can explain how my audio file is different and explain why I have changed it in that way.</p>	<p>I know the key concepts of video composition.</p> <p>I understand why I need to plan and create a video storyboard, capture video according to my plan, and edit my finished product.</p> <p>I know the options of improvements to my video, and understand the effect of editing choices made.</p> <p>I can use a video recording device to carry out the following functions: recording, panning, focussing, zooming and editing specific recording effects (e.g. filters).</p> <p>I can locate, playback and transfer/export video I have recorded.</p> <p>I can edit video using the following functions, justifying my choices: selecting specific sections, applying effects, deleting sections, splitting sections, cropping sections of video.</p>	<p>I understand that a website is a set of hyperlinked web pages and understand the relationship between HTML and what appears on the webpage.</p> <p>I know that web pages can contain different media types.</p> <p>I understand that web pages are written by people</p> <p>I can consider the ownership and use of images (copyright) on a website.</p> <p>I understand the need for a navigation pathway in webpage design.</p> <p>I can review an existing website (navigation bars, header)</p> <p>I can create a new blank web page and add further web pages</p> <p>I can change the appearance a web page by adding text, media and selecting styles.</p> <p>I can preview a web page on different screen sizes.</p> <p>I can insert hyperlinks between pages and other sites.</p>
<p>Key Vocabulary: paint program, tool, paintbrush, erase, fill, undo, shape tools, line tool, fill tool, undo tool, colour, brush style, brush size</p>	<p>Key Vocabulary: device, camera, photograph, capture, image, digital, landscape, portrait, framing, subject, compose, light sources, flash, focus, background, editing, filter, format, framing, lighting</p>	<p>Key Vocabulary: animation, flip book, stopframe, frame, image, onion skinning, media, import, transition.</p>	<p>Key Vocabulary: Audio file, digitally, microphone, select, input, output, volume, Audacity, podcast</p>	<p>Key Vocabulary: Storyboard, panning, zooming, editing, filters, cropping, exporting.</p>	<p>Key Vocabulary: website, web page, browser, media, Hypertext Markup Language (HTML), layout, header, media, purpose, copyright, fair use, home page, preview, device, Google Sites, breadcrumb trail, navigation, hyperlink, subpage, implication, external link, embed.</p>

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computing					
Programming A					
Moving A Robot	Robot Algorithms	Sequencing Sounds	Repetition in Shapes	Selection in Physical Computing	Variables in Games
<p>I understand that a program is a set of commands that a computer can run.</p> <p>I know that a command produces an outcome.</p> <p>I understand that a series of instructions can be issued before they can be enacted.</p> <p>I can predict and then run my command on a floor robot.</p> <p>I can choose a series of commands that can be run as a program.</p> <p>I can build a sequence of commands that can be run as a program on a device</p>	<p>I know that a sequence is a series of instructions (commands).</p> <p>I know that a program is a sequence that can be run (executed).</p> <p>I understand that there is a different outcome when the order of the instructions is changed.</p> <p>I know that outcomes can be predicted before running (executing) a program.</p> <p>I can predict and run a command on a given device.</p> <p>I can list commands, giving commands for a given purpose.</p> <p>I can choose a series of commands that can be run as a program, building a sequence of commands in steps.</p> <p>I can run a program on a device.</p>	<p>I know that a program includes sequences of commands.</p> <p>I understand that the order of commands can affect a program's output.</p> <p>I know that different sequences can achieve different outputs, or the same output.</p> <p>I can build a sequence of commands.</p> <p>I can combine and order commands in a program.</p> <p>I can create a sequence of commands to produce a given outcome.</p>	<p>I can understand and identify 'loops' of repeated code within programs as repeating sets of instructions.</p> <p>I know that looped code within programs can run for an indefinite amount of time, or for a specified number of times.</p> <p>I know and understand when to use a looped instruction in my program and justify its use.</p> <p>I can use a count-controlled loop or an infinite (forever) loop to produce a specified output.</p> <p>I can plan a program that includes loops to produce a given outcome.</p> <p>I can create two or more sequences that can run at the same time.</p>	<p>I understand that a conditional statement can either be true or false.</p> <p>I know the difference between a count-controlled loop and a condition-controlled loop</p> <p>I understand that selection can be used to branch the flow of a program</p> <p>I understand that a forever (infinite) loop can be used to repeatedly check whether a condition has been met.</p> <p>I can create a condition-controlled loop.</p> <p>I can use a condition in an 'if...then...(else)' statement to start an action (produce an outcome)</p>	<p>I know that a variable is something that can be used and changed in a program.</p> <p>I can identify examples of variables and recognise that variable can be numbers or letters.</p> <p>I know that variables have specific names and its value can be used by programs to change outcomes.</p> <p>To recognise a variable can hold only one value at any one time and you cannot access the previous value.</p> <p>I recognise a variable can be set as constant (have a fixed value)</p> <p>To explain that the name of a variable needs to be unique and is meaningless to a computer</p> <p>I can identify variables in existing programs and experiment with changing them.</p> <p>I can decide where in a program to set a variable and use an event or input to update it.</p> <p>I can use a variable in a conditional statement to control the flow of a program.</p> <p>I can use the same variable in more than one location in program.</p>
<p>Key Vocabulary: Bee-Bot, forwards, backwards, turn, clear, go, commands, instructions, directions, left, right, route, plan, algorithm, program.</p>	<p>Key Vocabulary: Bee-Bot, forwards, backwards, turn, clear, go, commands, instructions, directions, left, right, route, plan, algorithm, program.</p>	<p>Key Vocabulary: Debug, sequence, decompose, selection, repetition, variables, input, output, algorithms, programs, code, block-based coding, Scratch, sprite, staging area, code block, run, event block, control blocks</p>	<p>Key Vocabulary: Loops, count-controlled loops, infinite loops, repetition, algorithms, logo, input, output.</p>	<p>Key Vocabulary: Crumble controller, algorithm, sequence, selection (if...then...statements), repetition, loop, count-controlled or infinite loop, conditional statement, LED, sparkle, debug.</p>	<p>Key Vocabulary: variable, change, name, value, set, event, declare</p>

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computing					
Data and Information					
Grouping Data	Pictograms	Branching Databases	Data Logging	Flat-file Databases	Introduction to Spreadsheets
<p>I know that objects can be counted.</p> <p>I understand that information can be presented in different ways.</p> <p>I can collect simple data and show that collected data can be counted.</p> <p>I can group objects to answer questions, understanding that objects can be grouped by similarities (attribute).</p> <p>I can describe a group of objects (based on commonality).</p>	<p>I know a tally chart is used to collect data</p> <p>I know that data can be grouped by their attributes and then compared.</p> <p>I know that tally charts and pictograms need headings which relate to the data.</p> <p>I know that information can be presented in different ways using a computer.</p> <p>I understand why some data (or information when in context) should not be shared.</p> <p>I can enter and view data on a computer.</p> <p>I recognise that people, animals and objects can be described by attributes.</p> <p>I can use a computer to answer single-attribute and comparison questions.</p>	<p>I understand that a branching database is an identification tool and know how it works.</p> <p>I know attributes can be identified by asking yes/no questions.</p> <p>I know that a well-structured branching database will enable you to identify objects using fewer questions.</p> <p>I know real-world applications for branching databases.</p> <p>I can create questions with yes/no answers.</p> <p>I can choose questions that will divide objects into evenly-sized smaller groups.</p> <p>I can identify an object using a branching database and retrieve information from different levels of the database.</p>	<p>I know that sensors can be used to gather data to answer a specific question.</p> <p>I understand what type of data to collect in order to answer a specific question.</p> <p>I know that a data logger captures data from specific points in time, using an appropriate environmental sensor.</p> <p>I know and can explain where to place a sensor to collect specific data to answer a question.</p> <p>I can identify a time frame and appropriate sensor to use, in order to capture data to answer a specific question.</p> <p>I can collect, analyse, evaluate and present data, in order to answer a specific question.</p>	<p>I know that a computer program can be used to organise data.</p> <p>I understand how operands (questions) can be used to filter data, and outline how 'AND' and 'OR' can be used to refine data selection.</p> <p>I understand that we present information to communicate a message and that computer programs can be used to compare data visually.</p> <p>I can choose different ways to view data, and choose which attribute and value to search by, to answer a given question (operand).</p> <p>I can choose multiple criteria to search data, in order to answer a given question (AND and OR).</p> <p>I can select an appropriate graph to visually compare data, and choose suitable ways to present data to other people.</p>	<p>I can explain what data is, and that it needs a context.</p> <p>I know a range of the different types of software tools that deal with and organise data.</p> <p>I know that formulas can be used to produce calculated data</p> <p>I know why data should be organised in a spreadsheet</p> <p>I know that cells can be linked and understand that a cell's value automatically updates when the value in a linked cell is changed.</p> <p>I can give examples of data types and contexts in which they may be used.</p> <p>I can identify and use data handling software and input, present and evaluate data.</p> <p>I can apply formulas to data and functions to create new data.</p> <p>I can explain how my data presentation represents the answer to a specific question.</p>
Key Vocabulary: object, label, group, search, image, property, colour, size, shape, value, data set, more, less, most, fewest, least, the same	Key Vocabulary: more than, less than, most, least, common, popular, organise, data, object, tally chart, votes, total, pictogram, enter, data, compare, objects, count, explain, attribute, group, same, different, conclusion, block diagram, sharing	Key Vocabulary: Branching database, Attribute / property, Yes/no questions, data, information.	Key Vocabulary: Sensor, data, information, data logger, time-frame, input, output	Key Vocabulary: Operand, data, information, selection, field, parameter, flat-file database.	Key Vocabulary: data, collecting, table, structure, spreadsheet, cell, cell reference, data item, format, formula, calculation, spreadsheet, input, output, operation, range, duplicate, sigma, propose, question, data set, organised, chart, evaluate, results, sum, comparison, software, tools.

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computing					
Creating Media B					
Digital Writing	Digital Music	Desktop Publishing	Photo Editing	Introduction to Vector Graphics	3D Modelling
<p>I understand that a keyboard enters text and changes the output of a key. I know that text can be edited and changed. I can consider the impact of choices made.</p> <p>I can use a keyboard to enter or remove text, including letters, numbers or special characters. I can select and change the position of text in a document. I can choose options to achieve a desired effect including changing the appearance of text.</p>	<p>I know that computers can be used to create sounds of different instruments that may be represented as patterns.</p> <p>I can experiment with musical sounds and patterns on a computer. I can use a computer to create a pattern, rhythm, and a melody on a theme. I can evaluate and improve music composed on a computer</p>	<p>I understand how text and images can be structured, using placeholders, to convey information. I know how different document layouts can suit different purposes. I understand the benefits and reasons why I might use a DTP application.</p> <p>I can add, delete, resize and rotate images to and from placeholders in a document. I can add, edit and change text, applying appropriate fonts, sizing and styles to suit the purpose of the document. I can reorientate a page, organising placeholders to suit the purpose, and review my document, making changes where necessary.</p>	<p>I understand that images can be changed for different purposes. I know that not all images are real, and that they can be manipulated. I understand the impact of the changes made on the quality of the image. I know the range of tools available for editing and understand their purpose.</p> <p>I can change the composition of images, including arranging images, cropping images and editing out a part of an image. I can apply changes to the whole image or part of it, including adjusting colours, adding filters, adding effects, retouching. I can add to an image, including drawing, add text, add an element (e.g.: borders, etc.)</p>	<p>I understand what a vector drawing is, and that different tools can be used to modify them. I know that objects can be layered and grouped, or sent backwards / forwards and how to do this. I know that vector images can be modified in a variety of ways, without impacting on quality, and can demonstrate this.</p> <p>I can describe a vector drawing and create it as a 2D drawing on a screen. I can group and layer objects on a screen and evaluate the impact of my choices. I can use a variety of modifying tools to change a vector drawing, by selecting, rotating, dragging, repositioning, adding, recolouring, resizing and grouping objects.</p>	<p>I can recognise that a 3D environment can be viewed from different perspectives. I can show how placeholders can create holes in 3D objects. I can recognise that artefacts can be broken down into a collection of 3D objects.</p> <p>I can position 3D shapes and use digital tools to modify 3D objects. I can use digital tools to accurately size 3D objects and combine them to create a 3D digital artefact. I can construct a 3D model which reflects a real world object.</p>
Key Vocabulary: word processor, keyboard, keys, type, space, backspace, text cursor, toolbar, bold, italic, underline, mouse, select, font, undo, redo, format, compare, typing	Key Vocabulary: quiet, loud, pattern, rhythm, pulse, pitch, tempo, rhythm, notes, beat, instrument, open, edit.	Key Vocabulary: Layout, landscape, portrait, placeholders, font, style, edit, right click, left click, group/ungroup.	Key Vocabulary: Image, filters, cropping, editing, composition, select, group, clone	Key Vocabulary: Vector drawing, layer, group, modify, 2D object.	Key Vocabulary: TinkerCAD, 2D, 3D, shapes, select, move, perspective, view, handles, resize, lift, lower, recolour, rotate, duplicate, group, placeholder, hollow, construct

Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Computing					
Programming B					
Programming Animations	Programming Quizzes	Events and Actions in Programs	Repetition in Games	Selection in Quizzes	Sensing Movement
<p>I understand that a program is a set of commands that a computer can run.</p> <p>I know that a command produces an outcome.</p> <p>I understand that a series of instructions can be issued before they can be enacted.</p> <p>I know a list of step-by-step commands is a sequence.</p> <p>I can choose a series of commands that can be run as a program.</p> <p>I can build a sequence of commands that can be run as a program on a device</p>	<p>I know that a sequence is a series of instructions (commands).</p> <p>I know that a program is a sequence that can be run (executed).</p> <p>I understand that there is a different outcome when the order of the instructions is changed.</p> <p>I know that outcomes can be predicted before running (executing) a program.</p> <p>I can predict and run a command on a given device.</p> <p>I can list commands, giving commands for a given purpose.</p> <p>I can choose a series of commands that can be run as a program, building a sequence of commands in steps.</p> <p>I can run and debug a program on a device</p>	<p>I know what an action and an event is.</p> <p>I know what program extensions are and how to use them.</p> <p>I know what a pen block is and how it can be used.</p> <p>I can use program extensions to set up my program.</p> <p>I can build more sequences of commands to make my program design work.</p> <p>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.</p>	<p>I understand that a loop command can be used to repeat instructions in a program.</p> <p>I understand that you can program a loop to stop after a specific number of times.</p> <p>I understand the importance of instructional order in a loop, and understand when to use a loop and when not to.</p> <p>I know the difference between a count-controlled and Infinite (forever) loop.</p> <p>I can use an infinite (Forever) loop in a program, to produce a given outcome.</p> <p>I can use a count-controlled loop (e.g.repeat x10) in a program, to produce a given outcome.</p> <p>I can create two or more sequences of code in a program, that run at the same time.</p>	<p>I understand that a conditional statement can either be true or false.</p> <p>I know the difference between a count-controlled loop and a condition-controlled loop</p> <p>I understand that selection can be used to branch the flow of a program</p> <p>I understand that a forever (infinite) loop can be used to repeatedly check whether a condition has been met.</p> <p>I can choose and condition and create a condition-controlled loop.</p> <p>I can use a condition in an 'if...then...(else)' statement to start an action (produce an outcome)</p>	<p>I know that a variable is something that can be used and changed in a program.</p> <p>I can identify examples of variables and recognise that variable scan be numbers or letters.</p> <p>I know that variables have specific names and its value can be used by programs to change outcomes.</p> <p>To recognise a variable can hold only one value at any one time and you cannot access the previous value.</p> <p>I recognise a variable can be set as constant (have a fixed value)</p> <p>To explain that the name of a variable needs to be unique and is meaningless to a computer</p> <p>I can identify variables in existing programs and experiment with changing them.</p> <p>I can decide where in a program to set a variable and use an event or input to update it.</p> <p>I can use a variable in a conditional statement to control the flow of a program.</p> <p>I can use the same variable in more than one location in. program.</p>
Key Vocabulary: ScratchJr, command, sprite, compare, programming, area, block, joining run, program, background, delete, reset, algorithm, predict,value, instructions	Key Vocabulary: sequence, command, program, run, start, outcome, predict, blocks, design, actions, sprite, project, modify, change, algorithm, build, match, compare, debug.	Key Vocabulary: Sequence, sprite, event, action, program, pen, stage, algorithms, selection, repetition, code, debug, output	Key Vocabulary: Repetition, loop, infinite, count-controlled, sequence, algorithm, sprite, debug.	Key Vocabulary: Algorithm, sequence, repetition, selection, loop, condition, count- controlled loop, condition-controlled loop.	Key Vocabulary: Micro:bit, MakeCode, input, process, output, flashing, USB, trace, selection, condition, if then else, variable, random, sensing, accelerometer, value, compass, direction,

					navigation, algorithm, step counter, test, debug.
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