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| **Computing Progression Map** |
|  | **Foundation Stage** | **Year 1** | **Year 2** | **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Computer Science** | ~ To know what an algorithm is. ~ To recognise different algorithms on different coding systems (beebot, Code.org, Purple Mash). ~ To create simple algorithms using coding systems. ~ To draw physical algorithms and plan how to program devices. ~ To predict where physical coding systems will move and program them correctly (beebots). | 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. | 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. |
| ~ Explain that an algorithm is a set of instructions. (1.4, 1.5)~ A computer program turns an algorithm into code that the computer can understand. (1.4, 1.7)~ Work out what is wrong when the steps are out of order in instructions. (1.4, 1.5)~ Fix a code if it isn’t working properly. (1.7)~ Make good guesses of what is going to happen in a program. (1.5, 1.7) | ~ Explain an algorithm is a set of instructions to complete a task. (2.1)~ Carefully plan an algorithm so it will work when it is made into code. (2.1)~ Design a simple program using 2Code that achieves a purpose. (2.1)~ Find and correct some errors in a program. (2.1)~ Say what will happen in a Program. (2.1)~ Spot something in a program that has an action or effect (does something). (2.1) | ~ Base a written algorithm for a program upon a real-life situation. (3.1)~ Design an algorithm carefully, thinking about what the program needs to do and how I could turn my algorithm into code. (3.1)~ Design a program thinking logically about the sequence of steps required. (3.1 Coding)~ Experiment with timers in my programs. (3.1)~ Experiment with the effect of using repeat commands. (3.1)~ Identify the difference in using the effect of a timer or repeat command in my code. (3.1)~ Identify an error in my program and fix it. (3.1)~ Read programs with several steps and predict what it will do. (3.1)~ Identify different ways that the Internet can be used for communication. (3.5)~ Use email such as 2Email to respond to others appropriately and attach files. (3.5) | ~ Turn a real-life situation to solve into an algorithm, using a design that shows how to accomplish this in code. (4.1, 4.5)~ Use repetition in my code. For example, using a loop that continues until a condition is met such as the correct answer being entered. (4.1)~ Use timers within my program designs more accurately to create repetition effects. (4.1)~ Use selection (decision) in my programming. For example, using an ‘if statement’ for a question being asked and the program takes one of two paths. (4.1)~ Use variables within my program and know how to change the value of variables. (4.1)~ Use the user inputs and output features within my program, such as ‘Print to screen’. (4.1)~ Identify errors in my code by using different methods, such as stepping through lines of code and fixing them. (4.1)~ Read programs that contain several steps and predict the outcomes with increasing accuracy. (4.1, 4.5)~ Recognise the main component parts of hardware which allow computers to join and form a network. (4.8)~ Understand that network and communication components can be found in many different devices which allow them to join the internet. (4.2, 4.7, 4.8) | ~ Make more complex real-life problems into algorithms for a program. (5.1)~ Test and debug my programs as I work. (5.1, 5.5)~ Convert (translate) algorithms that contain sequence, selection and repetition into code that works. (5.1)~ Use sequence, selection, repetition, and some other coding structures in my code. (5.1)~ Organise my code carefully for example, naming variables and using tabs, this will help me debug more efficiently. (5.1)~ Use logical methods to identify the cause of any bug with support to identify the specific line of code. (5.1)~ Learn the importance of computer networks and how they help solve problems and enhance communication. (5.2)~ Recognise the main dangers that can be perpetuated via computer networks. (5.2)~ Explain what personal information is and know strategies for keeping this safe. (5.2)~ Use the most appropriate form of online communication according to the digital content. For example, use 2Email, 2Blog and Display Boards. (5.2 & others) | ~ Turn a complex programming task into an algorithm. (6.1)~ Identify the important aspects of a programming task (abstraction). (6.1)~ Decompose important aspects of a programming task in a logical way, identifying appropriate coding structures that would work. (6.1)~ Test and debug my program as I work on it and use logical methods to identify a cause of a bug. (6.1)~ Identify a specific line of code that is causing a problem in my program and attempt a fix. (6.1)~ Translate algorithms that include sequence, selection and repetition into code and nest these structures within each other. (6.1)~ Use inputs and outputs within my coded programs such as sound, movement and buttons and represent the state of an object. (6.1, 6.7)~ Interpret (understand) a program in parts and can make logical attempts to put the separate parts together in an algorithm to explain the program as a whole. (6.1)~ Explain the difference between the Internet and the World Wide Web. (6.2, 6.4,6.6)~ Explain what a WAN and LAN is and describe the process of how access to the internet in school is possible. (6.2,6.6) |
| **Information Technology** |  | Use technology purposefully to create, organise, store, manipulate and retrieve digital content. | Use search technologies effectively, appreciate how results are selected and ranked, and be discerning in evaluating digital content.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. |
| ~ To identify the technology used in school. ~ To give examples of technology they have at home. ~ To take photos using iPads/tablets. ~ To create pictures using shapes on paint.~ With help, can use buttons to play back sound or video on a computer, tablet or a sound player.~ Begin to use a computer keyboard using single fingers, developing a familiarity with letters, numbers, backspace, arrow keys and spacebar. | ~ Sort sound, pictures and text. (1.2)~ Add sound, pictures and text to a program such as 2Create a Story. (1.6)~ Change content on a file such as text, sound and images. (1.3, 1.6, 1.7, 1.8)~ Name my work. (1.2, 1.3, 1.6, 1.7, 1.8)~ Save my work. (1.2, 1.3, 1.6, 1.7, 1.8) ~ Find my work. (1.2, 1.3, 1.6, 1.7, 1.8) | ~ Organise data – for example, using a database such as 2Investigate. (2.3, 2.4)~ Find data using specific searches – for example, using 2Investigate. (2.4, 2.5)~ Use several programs to organise information – for example, using binary trees such as 2Question or spreadsheets such as 2Calculate. (2.4, 2.8)~ Edit digital data such as data in music composition software like 2Sequence. (2.7 and most units)~ Name, save and find my work. (2.3, 2.4, 2.6, 2.7, 2.8 & most units)~ Include photos, text and sound in my creations. (2.8, 2.6) | ~ Carry out searches to find digital content on a range of online systems, such as within Purple Mash or on an Internet search engine. ~ Collect data and input it into software. (3.3, 3.6, 3.8)~ Analyse data using features within software to help such as, formula in 2Calculate (spreadsheets). (3.3, 3.6, 3.8)~ Present data and information using different software such as 2Question (branching database) or 2Graph (graphing tool). (3.3, 3.6, 3.8,3.9)~ Consider what the most appropriate software to use when given a task by my teacher. (Across units)~ Create purposeful (appropriate) content and attach this to emails. (3.3, 3.5, 3.6, 3.7, 3.8, 3.9) | ~ Understand the purpose of a search engine and the main features within it. (4.7)~ Look at information on a webpage and make predictions about the accuracy of information contained within it. (4.7)~ Create and improve my solutions to a problem based on feedback. For example, create a program using 2Code. (4.1, 4.2)~ Review solutions that others have created, using a checklist of criteria. (4.1, 4.2)~ Work collaboratively to create content and solutions. (4.1, 4.3, 4.4,48)~ Share digital content using a variety of applications such as: 2Blog, 2Email and Display Boards. (Across units) | ~ Search precisely when using a search engine. For example, add additional words or removes words to help find better results. (5.2)~ Explain in detail how accurate, safe and reliable the content is on a webpage. (5.2)~ Make appropriate improvements to digital work I have created. (Across units)~ Comment on how successful a digital solution is that I have created. ~ Work collaboratively with others creating solutions to problems using appropriate software such as 2Code. (Across units)~ Use collaborative modes such as within 2Connect to work with others and share it. (5.7) | ~ Use filters when searching for digital content. (6.2,6.9)~ Explain in detail how accurate and reliable a webpage and its content are. (6.2)~ Compare a range of digital content sources and rate them in terms of content quality and accuracy. (6.1, 6.3, 6.4, 6.5, 6.7,6.9)~ Consider the intended audience carefully when I design and make digital content. (6.1, 6.3, 6.4, 6.5, 6.7,6.9)~ Design and create my own online blogs. (6.4)~ Use criteria to evaluate the quality of my own and others digital solutions, suggesting refinements. (6.1, 6.3, 6.4, 6.5, 6.7,6.9) |
| **Digital Literacy** |  | 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. | Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concern about content and contact. |
| ~ Know how people communicated before computers, laptops and i-pads.~ Collect information, e.g. by taking photographs or collecting objects. ~ Begin to sort, sequence or group various objects on a screen or interactive whiteboard. ~ Produce simple digital pictograms with adult support. ~ Explore simple digital simulations and games and find out ‘what happens. | ~ Say what technology is. (1.9)~ Say what examples of technology are in school. (1.9)~ Say what examples of technology are at home. (1.9)~ Know that a smart phone uses new technology. (1.9)~ Keep my login information safe. (1.1 and most units)~ Save my work in a safe place such as ‘My Work’ folder. (1.1 and most units) | ~ Find information I need using a search engine. (2.5)~ Know the consequences of not searching online safely. (2.2, 2.5)~ Share work and communicate electronically – for example using 2Email or the display boards. (2.2 and others)~ Report unkind behaviour and things that upset me online, to a trusted adult. (2.2)~ See where technology is used at school such as in the office or canteen. (2.2)~ Understand that my creations such as programs in 2Code, need similar skills to the adult world. e.g., The program used for collecting money for school trips. (2.1) | ~ Create a secure password. (3.2)~ Explain the importance of having a secure password and not sharing it with others. (3.2, 3.5)~ Explain the negative consequences of not keeping passwords safe and secure. (3.2, 3.5)~ Understand the importance of keeping safe online and behaving respectfully. (3.2)~ Use communication tools such as 2Email respectfully and use good etiquette. (3.2, 3.5)~ Report unacceptable content online in more than one way to a trusted adult. (3.2) | ~ Understanding of the online safety rules we learn at school. (4.2 & across curriculum)~ Demonstrate how to use different online technologies safely. (4.2 & across curriculum)~ Demonstrate how to use a few different online services safely. (4.2 & across curriculum)~ Know that they have a right to privacy both on and offline. (4.2 & across curriculum)~ Recognise that my wellbeing can be affected by how I use technology. (4.2 & across curriculum)~ Report with ease any concerns with content and contact online and know immediate strategies to keep safe. (4.2 & across curriculum) | ~ Secure knowledge of online safety rules taught at school. (5.2 & across units)~ Demonstrate the safe and respectful use of different online technologies and online services. (5.2 & across units)~ Relate appropriate online behaviour to my right to have personal privacy. (5.2 & across units)~ Know how to not let my mental wellbeing or others be affected by use of online technologies and services. (5.2 & across units) | ~ Demonstrate safe and respectful use of a range of different technologies and online services. (6.2, 6.4)~ Identify more discrete inappropriate behaviours online. (6.2)~ Use critical thinking to help me stay safe online. (6.2)~ Know the value of protecting my privacy and others online. (6.2, 6.4) |
| **Online Safety** | ~ Understand what information is safe and unsafe online. ~ Understand how to communicate safely online. ~ Know what personal information they need to keep safe.~ Understand where to go for help and support when I have concerns about content on the internet. | ~ Demonstrate an understanding of the importance of online safety, using their own private usernames and passwords for Purple Mash (Unit 1.1 Lesson 1. Point 6). ~ Demonstrate an understanding of the reasons for keeping their password private including talking about the meaning of ‘private information’ (Lesson 1) and actively demonstrate this in lessons. (Throughout all lessons in Unit 1.1). ~ Take ownership of their work and will be able to save their work, using a memorable file name, to their own personal space on Purple Mash and understand that this can be retrieved later Unit 1.1 Lesson 1 Point 18.~ Add their name to their picture in lesson 1. ~ Explain that their teacher was able to connect with them online to leave a message in Purple Mash.~ Give a simple explanation of the way to word comments online. ~ Contribute their ideas about communicating appropriately and relate online and off-line appropriate behaviour. ~ Open Purple Mash and use the search bar within Purple Mash to find resources (lesson 2). ~ Suggest appropriate words to search with to find the results that they are looking for. | ~ Understand how to use the Purple Mash search bar and know the implications of inappropriate searches (Unit 2.2 Lesson 1. Point 1). ~ Explain what a digital footprint is, that it is permanent and their online behaviour influences what it shows (lesson 3). ~ Give reasons for keeping their password safe that include protecting their personal information.~ Express the good and bad sides of digital technology. They can give examples of positive effects on life as well as negative. ~ Pupils add their name to work but show a differentiation between full name and first name only when information is to be shared online. ~ Share their work to a display board (lesson 1). ~ Begin to understand how things are shared electronically (Unit 2.2 Lesson 1. Point 16). ~ Open and respond to simulated emails in 2Email (lesson 2) ~ Open and send email responses to simulated emails in 2Email (Unit 2.2 Lesson 2 Point 4). Furthermore, using 2Respond activities the pupils develop an understanding of how to use email safely and responsibly (Unit 2.2 Lesson 2. Point 4). ~ Know how to report inappropriate content to their teacher.~ Relate their digital footprint to their search history and make contributions to the class discussion about this in relation to online safety. ~ Know that many search engine companies collect and sell information about users. | ~ Understand the importance of a secure password and not sharing this with anyone else (Unit 3.2 Lesson 1 Point 1). Furthermore, pupils understand the negative implications of failure to keep passwords safe and secure and can suggest examples of good and poor passwords (Unit 3.2 Lesson 1 Point 1). ~ When using the internet, pupils can appraise the accuracy of the information on a website and make decisions on whether it is a trustworthy source of information (Unit 3.2 Lesson 2 Point 2). ~ Understand that it is not acceptable to use the work of others or post images of others without consent.~ Recognise the PEGI ratings and can give examples of why content is rated and how this protects them (lesson 3). ~ Contribute to a class collaborative file about the effects of inappropriate content with useful suggestions (lesson 3). ~ Demonstrate that they are developing their understanding of the features of online communication. In lesson 1, their blog posts and comments are appropriate. ~ Pupils can express the need to tell a trusted adult if they are upset by anything online.~ Pupils will be able to use Purple Mash as a platform for collaboration. ~ Pupils can create a spoof website for other pupils to read and share on a class display board (Unit 3.2 Lesson 2). In lesson 2, most pupils can use suitable keywords when trying to verify sources.~ Pupils understand the importance of staying safe (Unit 3.5 Lesson 3. Point 2) when using email. ~ Pupils apply their knowledge of email safety through the creation of a quiz on staying safe when emailing (Unit 3.5 Lesson 4. Point 3). ~ Pupils communicate appropriately online. ~ Pupils’ email messages illustrate that they have taken on board messages about appropriate communication with a regard for their audience.  | ~ Decide upon the most important online safety messages to communicate and share these ideas in their Top Tips for Online Safety publication (lesson 2, point 5 and onwards). ~ Put this knowledge into action in their own online activity. ~ Explore key concepts relating to online safety. (Unit 4.2 Lesson 1. Point 3). ~ They help others to understand the importance of online safety (Unit 4.2 Lesson 2. Point 3) ~ Apply their knowledge through the creation of online safety resources which are then used as part of presentation to parents (Unit 4.2 Lesson 1. Point 7). ~ Give some examples of things to look out for in an email to ensure that it from a valid source and is not a phishing scam email. ~ Explain what can be learnt by looking at the padlock details for a website (lesson 1) ~ Reflect upon positive and negative aspects of a digital footprint and can give examples of the care they would take when sharing online in relation to their and others’ digital footprint (lesson 1). ~ Give reasons for taking care when installing apps or software. ~ Know what Malware is and the possible impact of computer viruses and can give recommendations for how best to ensure that they only install valid software.~ Give reasons for limiting screen time that include the effect on physical and mental health. ~ Begin to make informed decisions about when to limit their own screen time.~ Explain how plagiarism is stealing. (lesson 3) ~ Include actions for reporting cyberbullying or inappropriate content in their screen time study document. ~ Save both online and locally to a device and are able to explain the differences between the two storage types. ~ Identify key messages that should be shared with other pupils and parents about online safety, including identification of reliable content from websites found via common search engines (Unit 4.2 Lessons 1 & 2).~ Analyse the contents of a web page for obvious clues about the credibility of the information. (Unit 4.7, Lesson 3). | ~ Demonstrate an understanding of their responsibility to others as well as to themselves when communicating and sharing content online. ~ Demonstrate a clear understanding of what the SMART rules are and how they should be applied to using technology safely and respectfully. (Unit 5.1 Lesson 1). ~ Demonstrate that they are developing critical thinking skills in their online experience and know what sorts of inappropriate content should be reported.~ Apply their knowledge in the creation of a comic strip to teach other pupils about online safety (Unit 5.2 Lesson 2). ~ See both the positive and negative consequences of technological developments including altering images both in terms of impact upon themselves and impact upon others. ~ Explain why citations must be considered when using the work of others. They know that there is a convention for recording citations and can put this into practice in their work. ~ Demonstrate a growing awareness of the context of communication and an ability to view the communication from the intended audience’s point-of view. ~ Understand what is meant by reliable and can build on their ability to identify reliable content. ~ Recognise that it is not a good idea to rely upon only 1 source for information, for example, the Pacific Tree Octopus example. | ~ Knowledge of the benefits and risks to working collaboratively. ~ Can navigate networks within Purple Mash (Work folders, class folders and group folders), the local network (school) and the Internet (using as a source for research or leisure time). They use these networks to collaborate using Purple Mash tools such as 2Write, 2Connect and 2Blog and can use a variety of networked devices such as webcams, online tools, printers, and tablets in a connected way for their educational benefit. ~ Use search tools and routinely try to verify the validity and reliability of their sources. They look for corroborating sources for information and enter keywords that help them to choose the best results. ~ Demonstrate an understanding of their responsibility to others as well as to themselves when communicating and sharing content online. ~ Identify a variety of risks and benefits of technology.~ Have strategies to help them promote a positive online image of themselves in their digital footprint. ~ Pupils can identify location sharing as a risk to online safety and could relate this to work done on protecting their identifying private information. ~ Identify the padlock and https as aids to the online safety and could explain what these mean, referring to the work that they did on this in previous years’ online safety units. ~ Have a clear understanding of terms such as Computer virus, Location sharing, phishing scams, spam email, Malware and Identity theft. ~ Make sensible contributions to the question of what risks there are when installing an App and the possible risks hidden in the small print. ~ Understand the impact of a positive and negative digital footprint and how to take control of their own online virtual image. ~ Balance the positive impact of technology with the reasons for limiting screen time that include the effect on physical and mental health. ~ Reflect on their own screen time and collective class screen time and begin to make informed decisions about when to limit their own screen time.~ Pupils routinely include citations in their research work across subjects. They also take care to credit the artist when using images from the Internet. ~ Pupils explored the existence of metadata to track the source of images. ~ Know how to explore the rights and permissions associated with an image online. ~ Explain the difference between copyright and privacy and are mindful of both aspects when working with images. ~ Make informed choices when communicating online for example selecting the appropriate form of communication for its purpose and audience. ~ Discuss the use of instant messaging in social contexts, aware of the pros and cons of using such tools.~ Recognise the approval process that their posts go through and demonstrate an awareness of the issues surrounding inappropriate posts and cyberbullying (Unit 6.4 Lesson 4. Point 6). ~ Pupils become active contributors to a blog, carefully considering their responses to blog posts to ensure that they are always respectful (Unit 6.4 Lesson 4. Point 12). ~ Pupils understand the implications of inappropriate use of the blog. |
| **Core Skills** | **At EYFS:**~ Be able to use a mouse/trackpad to move and place items on a screen, with increasing accuracy. ~ Be able to interact purposefully with icons and buttons in age-appropriate software using mouse clicks or taps. ~ Shows developing mouse control through simple activities on-screen including click- and-drag, drag-and-drop. ~ Be able to use a variety of electronic toys in play situations, with the intention of finding out how it works. | **At Key Stage One:**~ Be able to log onto an account on a computer or program with support. ~ Can enter text using single fingers, beginning to use more than one hand. ~ Can use a mouse/trackpad to move and place items accurately on a screen. ~ Use double click or tap where needed (if appropriate). ~ Be able to use a range of methods of interacting with a program e.g. right click, drag and drop, long tap etc. ~ Be able to save and retrieve work with support. ~ Be able to shut down a program or device at the end of a session. ~ Can use basic keyboard keys e.g. backspace, space bar, return. | **At Lower Key Stage Two:**~ When using a mouse or trackpad, be able to use left/right/double click and scroll. ~ Able to use more than one hand to enter text, using the keyboard. ~ Can use cut, copy and paste tools by right clicking or using the edit toolbar. ~ Be able to save, name and retrieve work effectively. ~ With guidance, be able to navigate a folder system to find and open a specific file e.g. Shared Drive, iPad camera roll or Dropbox. ~ Know and use basic keyboard function keys e.g. shift, caps lock, space bar, return. ~ If appropriate, know how to print a document. | **At Upper Key Stage Two:**~ When using a mouse or trackpad, be able to use left/right/double click and scroll. ~ When typing, often holds two hands over different halves of the keyboard and can use more than two fingers to enter text. ~ Be able to save, name and retrieve work effectively to a suitable location. ~ If appropriate, knows how to change print properties to affect the appearance of a printed document. ~ Be able to navigate a folder system to find and open documents e.g. Shared Drive, iPad camera roll or Dropbox. ~ Be able to create suitably named folders to organise documents, using appropriate file paths. ~ Know and use more advanced keyboard function keys e.g. insert, delete, ctrl+c, ctrl+v, ctrl+z. |