**National Curriculum Subject: Computing**

**Progression Map**

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| **Purpose of Study**  A high-quality computing education equips 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 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, pupils are equipped to use information technology to create programs, systems and a range of content. Computing also ensures that pupils become digitally literate – able to use, and express themselves and develop their ideas through, information and communication technology – at a level suitable for the future workplace and as active participants in a digital world. | | | |
|  | **Aims** | | |
|  | **Computer Science**  Understand what algorithms are and how they are implemented on digital devices using precise & unambiguous instructions.  Design, write & debug programs that accomplish specific goals, including controlling or simulating physical systems, solve problems by decomposing them into smaller parts.  Use logical reasoning to predict and explain how some simple algorithms work and detect and correct errors in algorithms & programs  Use sequence, selection and repetition in programs; work with variables and various forms of input and output.  Understand computer networks including the internet; how they can provide multiple services such as the World Wide Web.  Appreciate how search results are selected and ranked. | **Information Technology**  Use technology purposefully to create, organise, store, manipulate and retrieve digital content.  Use search technology effectively  Select, use and combine a variety of software on a range of digital services to design & create a range of programs, systems & content that accomplish given goals, including collecting analysing, evaluating and presenting data and information | **Digital Literacy**  Recognise common uses of information technology beyond school.  Use technology safely and respectfully, keeping personal information private.  Recognise acceptable/unacceptable behaviour  Identify where to go for help & support when they have concerns  Identify a range of ways to report concerns about content and contact |
| **YR**  **30-50** |  |  | I can show an interest in technological toys with knobs or pulleys, or real objects such as cameras or mobile phones.  I can show skill in making toys work by pressing parts or lifting flaps to achieve effects such as sound, movements or new images.  I know that information can be retrieved from computers.  I know how to operate simple equipment, e.g. turn on CD player and uses remote control. |
| **YR**  **40-60** |  | I can complete a simple program on a computer.  I can use ICT hardware to interact with age-appropriate computer software. |  |
| **YR**  **ELG** |  | I can select and use technology for particular purposes. | I can recognise that a range of technology is used in places such as homes and schools. |
| **1** | I can talk about existing storyboards of everyday activities  I can recognise that many everyday devices respond to signals and instruction  I can make programmable toys carry out instructions  I can tell if a program runs correctly or has an error  I can explain the steps in a simple algorithm  I can follow an algorithm without a computer  I can run a program  I can use a program to solve a problem  I know what problems are best solved by a computer program or a human  I know what an algorithm is  I know what a computer program is  I know that I have to press buttons to make a programmable toy work  I know that if the toy doesn’t do what I want it to; it is my fault  I know what to do if the toy doesn’t go where I want it to | I can explain why it can be useful to use a computer  I can use a computer to create a file  I can list jobs done by a computer in school  I can create something useful on a computer  I can print my work  I know what a file is  I know what a computer is  I know some of the jobs that computer can do  **Data Handling**  I know that information can be presented in different forms | I can list some of the dangers of using the Internet  I can explain why it is important to be safe online  I can use a computer safely  I can follow e-safety guidelines  I know who is a responsible adult  I know to tell a responsible adult if I am worried about something |
| **2** | I can order a collection of pictures into the correct sequence  I can draw my own storyboard of everyday activities  I can plan and give direct commands to make things happen e.g. playing robots  I can plan a linear sequence of instructions  I can explain the steps in a simple algorithm  I can explain how a computer follows an algorithm  I can predict how a computer program will behave  I can find a bug in a program and debug it  I can spot an error in an algorithm  I can explain why debugging is useful  I can compare algorithms in terms of speed and how easy they are to follow  I can write an algorithm on paper  I can write a simple program  I can break a problem down into smaller steps  I know what it means to run a program  I know what a ‘bug’ is  I know what it means to debug a program  I know that algorithms are a linear sequence of instructions  I know that we use algorithms in our everyday life e.g. getting dressed  I know how to break a problem down into smaller steps e.g. breakfast = making teas, making toast etc. | **General ICT Skills**  I can open work on a computer  I can edit my work on a computer  I can save my work on a computer using an appropriate file name  I can organise my files on a computer  I can list jobs done by a computer outside school  I can say when it is better to use a computer and when its better not to  I know it is important to give appropriate file names so that I can retrieve the work  I know that editing on the computer is acceptable  **Word Processing**  I can navigate a word document using arrow keys and a mouse  I can use the backspace button and the delete button to remove text  I can use the shift button to create capital letters  I can change the font, size and colour of text  I can use bold, italic and underline  I know how to use MS Word efficiently to create well formatted documents  **Spreadsheet Skills**  **I** can create a new spreadsheet document  I can organise data in a spreadsheet  I can create a bar graph from a spreadsheet  I know what data is  I know that a spreadsheet will show information figuratively or pictorially  **Web Research Skills**  I can search for something online  I can understand the order of results returned in a search  I know that the Internet contains information on many subjects and that a search engine helps to order it  **Internet Skills**  I can accurately enter a website address  I can use hyperlinks to move around a website  I can use the ‘back’ and ‘forwards’ buttons efficiently  I know what communication is  I know what software is  I know what searching the Internet means | I can describe what information should be kept private  I can use the Internet without giving away private information  I can send a message using a computer without upsetting anyone  I can recognise something online as bad or wrong  I can recognise something online as good or helpful  I can say how my family could be safer online  I can tell people what they can do if they see anything bad online  I can identify computer peripherals and describe their purpose  I can describe how I use IT at school and home  I know some parts of a computer  I know how a computer is used at home and at school  I know what private information is  I know the difference between private and public  I know who to tell if I come across something ‘bad’ online |
| **3** | I can recognise similarities between storyboards of everyday activities  I can give some examples of what algorithms can be used for  I can explain why computer are sometimes used to control things  I can follow a sequence of instructions  I can use a program to control a gadget  I can develop and improve programs  I can tell when an algorithm has worked or not  I can run a program  I can debug a program to fix a problem  I can explain the strengths and weaknesses of using a simulation compared to the real thing  I can write my own algorithm  I know what an algorithm is  I know what debugging is  I know what computer control means  I know what algorithms can be used for  I know how to control a programmable toy  I know that simulations help us to do, for example, potentially dangerous things, safely e.g. flying simulator  I know that simulations are not real | **General ICT Skills**  I can explain what the Internet can be used for  I can use software to create work for a given purpose  I can create my own piece of work  I can resize windows  I can take screen shots  I can cut and paste effectively  I know computer shortcuts to format work  **Word Processing**  I can use a spellchecker  I can use undo and redo  I can align text left, right, centre and justify  I can insert Clipart or Wordart and manipulate it  I can save work as a pdf file  I know how to ‘layout’ processed work to the best effect  I know how to edit my work effectively  **Web Research Skills**  I can search for information on the Internet  I can open multiple web pages without leaving the search  I can copy text from an internet page to an office document  I can copy images from an internet page  I know the Internet contains text and images  I know not all Internet content is correct  I know that I cannot use all Internet content (copyright) | I can explain what respectful means  I can explain what responsible means  I can explain what safe means  I can explain how to report unacceptable uses of technology  I can create something that tells people how to stay safe  I know some important people and events in the history of computing  I know how to ‘behave’ online  I know who to tell about problems online |
| **4** | I can explain why computer are sometimes used to simulate things  I can present a simple algorithm diagrammatically  I can explain how an algorithm works  I can spot when a program goes wrong  I can fix an error in an algorithm  I can explain why programs need to be tested and debugged  I can repeat something a certain number of times  I know that programs sometimes go wrong  I know why it is imperative to test a program  I know how to create regular shapes using the ‘repeat’ command | **General ICT Skills**  I can explain the difference between data and information  I can choose which program to use to make a piece of work  I can explain how the Internet lets people communicate  I can use the Internet to communicate with other people  I know how useful the Internet is to communicate with other people  I know the most suitable program to use for different tasks e.g. MS Publisher for a booklet  **Presentation Skills**  I can create a new presentation document  I can save and retrieve a presentation  I can insert text into a presentation slide  I can insert photos/clipart into a slide  I can arrange components of a page  I can add new slides to a presentation  I can present my work to others using a computer/device  I can add animations to a slide  I know some of the skills needed to present my work to others e.g. pace, not reading the information, look at audience etc  I know some of the skills required to ‘layout’ my presentation effectively and for a given audience e.g. background, font, balance of text and images  I know that I should give my presentation a unique name when saving  **Web Research Skills**  I can use Google synonym search  I can use Google dictionary definition  I can find physical places with Google maps and Google Streetview  I know when web research is the appropriate tool to use  I know that not all information on the Internet is reliable  I know how to use Google Maps and Streetview to get directions  **Internet Skills**  I can add a page to my favourites  I know that using ‘favourites’ helps me to retrieve websites quickly  **eSafety Skills**  I can be responsible for keeping passwords safe  I can understand the risks of sending messages to other people online  I know that passwords should never be written down  I know never to tell someone a password | I can explain how and why the use of computers varies between home and school  I can explain the difference between acceptable and unacceptable behaviour when using technology  I can explain why people need to be safe online  I can explain why people should be responsible online  I can understand why people should be respectful online  I can create something that tells people how to use technology responsibly  I can create something that tells people how to use technology respectfully  I know the dangers of communicating with people over the Internet  I know how to report unacceptable Internet use  I know how to use ICT to inform people of how to use the Internet safely.  **Email Skills**  I can send an email  I can reply to an email  I can forward an email  I can add an attachment to an email  I can email a link  I know how an email is sent over the Internet  I know email etiquette  I know the importance of using an effective title on my email |
| **5** | I can explain the difference between input and output  I can write my own programs  I can ‘think through’ an algorithm and predict an output  I can decompose a problem into its sub problems and use notation to represent it e.g. lighthouse mimic in Flowol  I can analyse and represent symbolically a sequence of events  I can create algorithms using selection and repetition  I can recognise similarities between simple problems and the commonality in algorithms used to solve them  I know the difference between a physical system and a simulation  I know what a network is  I know the importance of planning an algorithm and how to predict its outcome  I know what symbols to use when creating a pictorial algorithm  I know what selection and repetition means  I know that some algorithms maybe used in many programs e.g. algorithm for heat sensor | **General ICT Skills**  I can explain how the Internet lets people collaborate  I can use a computer to collect data  I can use a computer to analyse data to show something useful  I know computers are more efficient at collating data in comparison to paper based system  I know that collaborating over the Internet is an efficient way of communicating over distances  **Presentation Skills**  I can change the background colour of a slide  I can apply transitions between slides in a slideshow  I know how to improve my presentation by using transition  **Web Research Skills**  I can use Google to fill in the blanks in a search  I can use Google to exclude words from a search  I can use more advanced search options in Google  I can ignore information on the Internet that isn’t relevant  I can work out which search result is the most relevant  I can create advice for others on how to search effectively on line.  I know the importance of narrowing a search on Google  I know that some of the information posted online may not be relevant  I know that the suffix on a web address will indicate its origin e.g. .gov, .sch  I know that looking at the suffix on a website will give some indication of reliability.  I know how to advise people on searching the Internet effectively | I can describe some important people and events in the history of computing  I can classify devices in terms of input and output  I can use technology safely  I can use technology in a responsible way  I can use technology in a respectful way  I can report unacceptable uses of technology  I know that computers are used in lots of everyday devices  I know that special devices and services are required to connect to the internet  I know how to use the Internet and email in a responsible manner  I know how and who to report any unacceptable use of technology to. |
| **6** | I can write a program that controls a gadget  I can use a variable to keep track of something (e.g. counting)  I can make a decision based on a selection instruction  I can compare two different algorithms that do the same thing in different ways  I can reflect critically on my programs in order to make improvements in subsequent programming tasks  I can make a simulation of a physical system  I know what a variable is  I know how to use algorithms to create complex programs  I know how to use algorithms from one program in another program e.g. traffic light in Flowol  I know how a simulation can help when working out ‘bugs’ in a program | **General ICT Skills**  I can explain why some search results appear higher than others on a search engine  I can use the Internet to collaborate with other people  I can describe what can go wrong when using the Internet to communicate or collaborate  I can explain the advantages and disadvantages of using the Internet to communicate  I know how to use the Internet as a collaboration tool  I know how search engines work  I know how to ‘search’ effectively online  **Spreadsheet Skills**  I can create a line graph from a spreadsheet  I can use the ‘formula’ button to create totals  I can use the ‘formula button to add, multiply and find averages.  I can format information in a spreadsheet  I know how useful a spreadsheet is when working out large columns of figures  I know some of the business uses of a spreadsheet  I know the value and reason for creating formula in a spreadsheet  I know how to format a spreadsheet so it can be read and used effectively  **Presentation Skills**  I can add sound to a presentation  I can add a video to a presentation  I can change the running order and slide timings  I can talk alongside a presentation  I can print a presentation as a handout  I know how to make my presentation relevant to an audience  I know how to make notes to help me talk alongside my presentation  I know how to import sound and video into my presentation from other sources  **Web Research Skills**  I can name my sources  I can use Google documents  I can recognise bias and question website authority  I know about plagiarism  I know how to reference my sources in a bibliography  I know how to use online storage to help in collaboration with others  **eSafety Skills**  I can understand about the nature of cyber-bullying and cyber-friendship  I know how any of my data is being used and/or stored  I know what collaboration is | I can identify internal and external components within a computer system and describe their purpose  I can identify benefits and limitations of using IT both inside and outside school  I can make links between people and events in the history of computing  I can spot acceptable and unacceptable behaviour when using technology  I can evaluate how safe someone’s behaviour is when using technology  I can evaluate how responsible someone’s behaviour is when using technology  I know the similarities and differences between computerised everyday devices  I know how computers connect to the internet  I know the components of a desktop computer  I know the main pioneers and innovators of computing history  I know how to report unacceptable behaviour online to outside agencies e.g. childline and CEOP  I know how to keep my personal data safe  I know how to use social media safely  I know where the privacy settings are on social media |