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| **Substantive knowledge Computing Curriculum**  Kensington Junior Academy |

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| **Autumn** | | | |
| **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Coding** | **Coding** | **Coding** | **Coding** |
| * Knows what a flowchart is and how flowcharts are used in computer programming. * Knows how to use a flowchart to create a computer program. * Knows that there are different types of timers used in coding environments such as 2Code. * Knows which timer should be used for a given purpose. * Know what a repeat command is and how to use the repeat command. * Know how to create a range of programs using coding knowledge. * Know how to run, test and debug their own programs. * Know what nesting is and that this should be considered when debugging. * Know how to change attributes/properties of any objects in a program they have made. | * Begin to know what selection is in computer programming. * Know how an IF statement works. * Know how to interpret an IF statement and therefore know how to create a program that includes an IF statement. * Know how to use co-ordinates in computer programming. * Know what the ‘repeat until’ command is. * Know how an IF/ELSE statement works. * Know what a variable is in programming. * Know how to use variables within their programs. * To know how to create a playable game using a block coding environment. | * Begin to know how to simplify code in order to make own programming more efficient. * Know how to create a simple simulation using 2Code. For example, a traffic light sequence. * Know what decomposition and abstraction are in computer science. * Know the need to start coding at a basic level of abstraction to remove superfluous details from own programs. * Know how to use decomposition to make a plan of a real-life situation. * Know what a function is in coding and know how to use a function in own program to make it more efficient. * Know what different variable types are. * Know what strings are and how to use them. * Know how to set and change variable values in code. * Know some of the common ways that text variables can be used in programming. | * Know how to implement a game which includes timers and a score. * Know what the launch command is. * Build on knowledge of functions. * Know how to use multiple functions in own program. * Know how to arrange code in multiple tabs. * Know how to develop creativity when coding to generate novel effects. * Know the different options of generating user input in 2Code. * Know how to attribute variables to user input. * Know the need to code for all possibilities when using user inputs. Know how 2Code can be used to make a text-based adventure game. * Know with improving understanding of how they can alter existing programs to reflect their own ideas. * Building on existing knowledge of debugging, children know how to debug more effectively. |
| **Online Safety** | **Online Safety** | **Online Safety** | **Online Safety** |
| * Knows what makes a safe password and how to keep it safe. * Knows the main outcomes of not keeping passwords safe. * Knows all the common ways the Internet enables people to effectively communicate. * Know that a blog can be used to help communicate with a wider audience. Know how to contribute to a blog with clear and appropriate messages. * Know that some information held on websites may not be accurate or true. * Beginning to know how to search the Internet and how to think critically about the results returned. * Know why there are age restrictions on digital media and devices. * Know where to turn to for help if they see inappropriate content or have inappropriate contact from others. | * Know that information put online leaves a digital footprint or trail and can expand on prior years’ scope of this fact. Know some of the ways children can protect themselves from online identity theft. * Know that information put online by users could be used for identity theft. * Know the main risks and benefits of installing software and applications. * Know that copying work of others and presenting it as their own is plagiarism. Knows the consequences of plagiarism. * Knows appropriate behaviour when participating or contributing to collaborative online projects for learning. * Know some of the main positive and negative influences technology has on health and the environment. * Knows the importance of balancing screen time with non-screen time | * Know in more detail from prior learning of the impact that sharing digital content can have. * Know how to think critically about information they share online. * Know responsibilities they have for themselves and others regarding online behaviour. * Know and have developed knowledge from prior years about maintaining secure passwords. * Know about image manipulation using software and the advantages or disadvantages of this when shared online. * Know what is meant by appropriate and inappropriate text, photographs and videos. * Know about the impact of sharing media such as photographs and videos online. * Know about the importance of citing content online from others and know how to do this. * Know how to select keywords and search techniques to find relevant information to increase reliability. | * Know the benefits and risks of mobile devices broadcasting the location of the user/device, e.g., apps accessing location. * Know what secure sites are. * Know that secure sites will have industry standard seals of approval. Build on knowledge of Digital Footprints. For example, know how and why people use their information. * Build on knowledge of appropriate online behaviours and how this can protect themselves and others from possible online dangers. For example, the dangers of promoting inappropriate content online. * Have greater knowledge of how to make more informed choices of how free time is used. * Know the effects on individual health when having too much screen time. |
| **Spread sheets** | **Spreadsheets** | **Spreadsheets** | **Spreadsheets** |
| * Know how to create tables of data within a spreadsheet. * Know how to use a spreadsheet program to automatically create charts and graphs from data. * Know how to use various features within a spreadsheet to support solutions to calculations. For example, ‘more than’, ‘less than’, and ‘equals’. Know how to describe a cell location in a spreadsheet. * Know how to find specified locations in a spreadsheet. | * Know what cell formatting is. * Know how to format cells as currency, percentage, decimal or fraction. * Know how to use formula wizard tools. * Know how to combine spreadsheet tools to create a purposeful spreadsheet e.g. a timed times table test. * Know how to use a spreadsheet to model a reallife situation e.g. budget planner. * Know how to add a formula to a cell in order to create automatic calculations. | * Know how to use formulae within a spreadsheet to convert measurements of length and distance. * Know how to use more advanced formulae effectively. For example, to use formulae to calculate area and perimeter of shapes. * Know how to create formulae that use text variables. * Know how to use tools within a spreadsheet e.g. 2Calculate and the count tool to answer hypotheses. For example, to answer hypotheses about common letters in use. | * Know how to create a spreadsheet to help answer a mathematical question relating to probability. * Know how to take ‘copy’ and ‘paste’ shortcuts. * Know how to problem solve during mathematical investigations when using spreadsheets by using tools such as the ‘Count tool’. * Know how to create a spreadsheet to produce computational models. For example, creating a spreadsheet that works out discounts and final price sales. * Children will know how to use advanced formula to assist with this. * Know how to use a spreadsheet to help plan actions. For example, create a * spreadsheet to plan how to spend pocket money and the effect of saving. |

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| **Spring** | | | |
| **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Touch typing** | **Writing for Different Audiences** | **Databases** | **Blogging** |
| * Know typing terminology including names of fingers. * Know the home, top and bottom row sections on a keyboard. * Knows the keys typed with left hand. Knows the keys typed with right hand. Knows the correct way to sit at a keyboard. | * Know how font size and style can affect the impact of a text. * Know how to use a simulated scenario to produce a news report and campaign using technology. | * Know how to search for * information within a database. * Know the different ways to search for information in a database. * Know how to add information into a shared database. * Know how to create own database. * Know how to create new records. * Know what fields are and * know how to correctly add information. * Know how to phrase questions so they can be correctly answered using a search of database. | * Know the purpose of writing a blog. Know the features of successful blog writing. * Know how to plan a blog. * Know how to write a blog. * Know how to write a blog post. * Know that the way information is presented within a blog has an impact upon the audience. * Know how to contribute to others’ blogs. * Know the importance of having an approval process when creating blog content or modifying it. * Know from Online Safety knowledge that content within blogs applies. For example, children know the issues surrounding inappropriate posts and cyberbullying. |
| **Email** | **Logo (coding)** | **Game Creator** | **Text Adventures** |
| * Know the different methods of communication and know the strengths and weaknesses of his form. Know how to open and responding to email. * Know how to use an address book to write an email. | * Know the structure of the coding language of Logo. * Know how to input simple instructions in Logo language environment. * Know how to create letter shapes using Logo. * Know what the repeat function in Logo is and its usefulness. * Use it to create shapes such as squares. Know what procedures are and use this knowledge to build procedures in Logo. | * Know what some of the main elements are that make a successful game. * Know how to plan a playable game. * Know how to incorporate media such as sound and images. * Know how to manipulate media including adding animation. * Know how to successfully evaluate games. | * Know what a text based adventure is. * Know how to convert a simple story with 2 or 3 levels of decision making into a logical design. * Know how to use the functionality of 2Create a Story Adventure mode to create, test and debug using plans. * Know the difference between a map-based game and a sequential story-based game. * Know how to use written plans to code a map-based adventure using 2Code. * Know how to recall existing knowledge to support coding a map-based adventure game. For example, using functions, two-way selection (IF/ELSE statements) and repetition. |
| **Branching Databases** | **Animation** | **Modelling** | **Networks** |
| * Know how to sort objects using just YES/NO. * Know how YES/NO questions are structured and answered. * Know how to complete a branching database. * Know how to edit and adapt a branching database. * Know how to create a branching database including debugging it. | * Know how animations are created by hand. * Know how animations are created using computers. * Know what onion skinning is when referring to animation. * Know that animations can be enhanced using features in software such as background and sounds. * Know what ‘stop motion’ animation is. | * Know what modelling software is and the skills of computer aided design. * Know the effect of moving points when designing. * Know how to design a 3D model to fit certain criteria. * Know how to refine and print a model. | * Know the difference between the World Wide Web and the Internet. * Know what a WAN and LAN is and the key differences between them. * Know how a school network accesses the Internet. Know the history of the Internet. * Know some of the major changes in technology which have taken place in their lifetime. |

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| **Summer** | | | |
| **Year 3** | **Year 4** | **Year 5** | **Year 6** |
| **Simulations** | **Effective searching** | **Concept Maps** | **Quizzing** |
| * Know that a computer simulation can represent real and imaginary situations. Know advantages and problems of using simulations. * Know how to use a simple simulation to try out different options and test predictions. * Begin to know how to evaluate simulations by comparing them with real simulations and considering their usefulness. | * Know how to find information from a search results page. * Know how to search effectively to find out information. * Know how to identify if an information source is true and reliable. | * Know the need for visual representations when generating and discussing complex ideas. Know the uses of a ‘concept map’. Know what is meant by ‘concept map’, ‘stage’, ‘nodes’ and ‘connections.’ * Know how to create a concept map using software such as 2Connect. * Know that concept maps can be used to retell stories and information. * Know how to present a concept map to an audience. | Know how to use create  activities for younger children  using software such as 2DIY.  • Know about different question  types within quizzing  software tools such as 2Quiz.  • Know how to give and  respond to feedback based on  quizzes made.  • Know how to create their own  grammar games.  • Know how to use multiple  pieces of software to enhance  a quiz. For example, creating a  quiz that requires children to  look up information on a  database |
| **Graphing** | **Hardware Investigators** | **Word Processing** | **Binary** |
| * Know how to set up a graph   with a given number of fields using graphing software (2Graph).   * Know how to enter data for a graph. * Know how to select the most appropriate chart type for their data and explain reasoning. * Know how to sort data in graphing software to enable easier analysis. | * Know there are key parts that make up a computer. * Know what each of the key parts is called and the function of them. | • Know what a word processing  tool is for.  • Know how to create a word  processing document.  • Know how to alter the look of  text and navigate around a  document.  • Know how to alter page layout  including heading and  columns.  • Know how to add and edit  images.  • Know how to add features to  enhance look and usability within a document. For example: textboxes, hyperlinks, contents pages.  • Know how to use tables to  present information. | Know that all data in a  computer is saved in the  computer memory in a binary  format.  • Know that binary uses only  the integers 0 and 1.  • Know that we can relate 0 as  an ‘off’ switch and 1 to an ‘on’  switch.  • Know how to count up from 0  in binary using visual aids if  required.  • Know that bits are related to  computer storage.  • Know how to convert  numbers to binary using the  division by two method.  • Know how to use a converter  tool to check binary  conversions. |
| **Presenting 3.9** | **Music Programming** |  |  |
| * Know what presentation is and how it can be used. * Know how to add pages/slides, text and shapes to pages, and also format them. * Know how to add media such as images, audio and videos. * Know how to use effects and * features such as animations and slide transitions. * Know how timings can help when presenting and know how to include them in presentations. * Know how to effectively present to an audience using presentation software | * Know the main elements of music. * Know what rhythm and tempo is and able to use this knowledge to experiment with it. * Know that computers can be used to create music compositions. * Know how to apply knowledge of music to create own composition using software. |  |  |