**Curriculum Content Map**

**Year group: 8**

**Subject: Computer Science**

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|  | **Term 1** | | | | **Term 2** | | | **Term 3** | | | |
| Month | **September** | **October** | **November** | **December** | **January** | **February** | **March** | **April** | **May** | **June** | **July** |
| Virtue | **Friendliness & Civility** | **Justice & Truthfulness** | **Courage** | **Generosity** | **Gratitude** | **Good Speech** | **Good Temper & Humour** | **Self-Mastery** | | **Compassion** | **Good Sense** |
| Skill | **Listening** | **Leadership** | **Problem-Solving** | **Creativity** | **Staying Positive** | **Speaking** | **Staying Positive** | **Aiming High** | | **Speaking** | **Teamwork** |
| Curriculum Content | 8.1 E-Safety  8.2 Intermediate Binary | | 8.3 Website Development | | 8.4 Python Basics | | 8.5 My Party | 8.6 Hardware and Software | | 8.7 Logic Gates | |
| National Curriculum area | KS3.9 – Using technology safely  KS3.6 Data representation | | KS3.7 Creative Projects | | KS3.3 Textual programming language | | KS3.7 Analysis of data | KS3.5 Understanding hardware and software. | | KS3.4 Boolean Logic | |
| Link to Virtue | Friendliness and civility – safe and respectful online communication. | Students explore the truth about how computers store images. | Students demonstrate courage while writing HTML code. | Students demonstrate generosity by creating websites which are easy to use. | Students demonstrate gratitude for apps by understanding how they are developed. | Students demonstrate good speech while giving effective feedback. | Students demonstrate good humour while developing hypothetical life scenarios. | Students demonstrate self-mastery by exploring how to build a computer. | | Students demonstrate compassion by developing systems which meet user needs. | Students demonstrate good sense while making effective decisions through the use of logic gates. |
| Link to Skill | Students learn binary as a method of listening to computers. | Students demonstrate leadership while working in groups to convert an image into binary. | Students test their websites and problem-solve any issues with these. | Students demonstrate creativity by developing a website. | Students stay positive while debugging logic and syntax errors. | Students demonstrate good speech while giving effective feedback. | Students stay positive while writing and testing Excel formulae. | Students aim high by designing computer systems. | | Students are able to articulate the decisions made while developing logic gates. | Students develop logic circuits as part of teams. |
| Sequencing  Image result for skills icon | Builds Upon  Students explore staying safe on social media in 7.1. This lesson explores cyber bullying. | Builds Upon  In 7.1, students focus on binary/denary conversions and character sets.  This unit includes binary addition and image representation. | Builds Upon  Unit 7.5 (Apps 4 Good) focuses on AI design. This builds these skills further by developing websites. | | Builds Upon  Unit 7.4 (Kodu) teaches students how to develop games in a block editor format. These skills are developed further through text-based coding. | | Builds Upon  KS2.6 focuses on the collection and analysis of data, which may include the use of basic spreadsheet formulae (e.g. addition) | Builds Upon  KS2.6 focuses on selection of suitable software. This unit builds on this to include the choice of hardware. | | Builds Upon  This unit is a practical working of binary, bringing together the concept of binary (topics 7.1 and 8.1) and hardware (topic 8.6) | |
| Is further developed in  In 9.1, students focus on developing their online brand. | Is further developed in  In 9.2, students focus on Sound representation and compression. | Is further developed in  In 9.6, students bring together their skills of AI design with spreadsheet analysis to develop their projects. | | Is further developed in  Unit 9.4 develops their programming skills further, to include lists and procedures. | | Is further developed in  Unit 9.5 focuses on creating data dashboards, in preparation for BTEC IT. | Is further developed in  Hardware and software links to topics 1.1 to 1.5 of the OCR GCSE Computer Science specification. | | Is further developed in  Boolean logic is developed further in topic 2.4 of the OCR GCSE Computer Science specification. | |
| Retrieval C:\Users\meltynegate\Pictures\icons for booklet\cloud.png | Prior knowledge of staying safe online checked. | Prior knowledge of binary/denary conversions checked. | Prior knowledge of GUI design and user friendliness checked. | | Prior programming understanding (Scratch or Kodu) checked). | | Previous knowledge of spreadsheets from KS2 checked. | Previous knowledge of computer parts checked. | | Binary conversion skills checked. | |
| New Learning C:\Users\meltynegate\Pictures\icons for booklet\steps.png | L1 – The impacts of Cyber Bullying. | L1 – Binary/Denary conversions  L2 – Binary addition.  L3 – Data representation of images.  L4 – File sizes of images.  L5 – Image compression. | L1 – Basic HTML.  L2 – User Interface Design.  L3 – Navigation (on Serif WebPlus).  L4 – Adding content to a webpage.  L5 – Web forms.  L6 – Testing and evaluation. | | L1 – Print statements and syntax errors.  L2 – Selection.  L3 – Iteration (WHILE loops)  L4 – Iteration (FOR loops)  L5 – My Quiz  L6 – Categorisation (Akinator) | | L1 – Basic formulae (SUM, +, -, \*, /)  L2 – Researching costs.  L3 – Drop-down boxes and VLOOKUP.  L4 – Conditional formatting.  L5 – “What if” scenarios.  L6 – Testing and evaluation | L1 – Computer Systems (Input-Process-Output).  L2 – CPU  L3 – Storage  L4 – Memory  L5 – Networks  L6 – Building Systems | | L1 – AND/OR Gates  L2 – Multiple gates (to include NOT gate).  L3 – XOR gates | |
| Independent Practice | Students develop a set of ‘internet etiquette’ rules for being positive online. | L1 – Students convert between binary and denary.  L2 – Students practice the skill of binary addition.  L3 – Students create an image on a spreadsheet using binary and conditional formatting.  L4 – Students calculate the size of images.  L5 – Students practice RLE compression, calculating the effectiveness of compression. | L1 – Students create a basic webpage using basic HTML.  L2 – Students develop a User Interface using storyboard design.  L3 – Students create a website, linking pages together using a navigation bar.  L4 – Students populate their website with information and images.  L5 – Students add a web form to their website.  L6 – Students test their websites and evaluate the effectiveness of these. | | L1 – Students create a series of print statements. Students are expected to identify and debug errors with given code.  L2 – Students create code to make basic decisions (e.g. check a young person is the right age to attend youth club).  L3 – Students create an password strength checker using while loops.  L4 – Students create a series of small programs using for loops. These start as basic repetition but develop to use the counter variable.  L5 – Students create a multiple choice quiz including a score.  L6 – Students create a basic Akinator game to guess the animal. | | L1 – Students create a basic spreadsheet of costs for their party. Outcome is subtracted from income.  L2 – Students research costs for the party (e.g. different entertainment).  L3 – Students use drop-down boxes and VLOOKUPs to make decisions.  L4 – Conditional formatting is used to indicate if the party is over or under budget.  L5 – Students work through a series of scenarios (e.g. if only 50% of people will be coming, the budget goes down).  L6 – Students test and evaluate their spreadsheet. | L1 – Students are able to identify inputs, processes and outputs for given systems.  L2 – Students are able to identify and define clock speed and cores, calculating the maximum overall clock speed.  L3 – Students are able to choose suitable storage for given scenarios, taking into account capacity, price and robustness.  L4 – Students are able to explain the differences between ROM and RAM, and why ROM is more prominent in embedded systems.  L5 – Students are able to design a computer network including WAPs and WNICs.  L6 – Students will build a computer. | | L1 – Students will work through a series of written scenarios, drawing the logic circuits and writing the truth table for single-gate systems.  L2 – Students will work through a series of written scenarios, drawing the logic circuits and writing the truth table for multiple-gate systems.  L3 – Students will work through a series of written scenarios, drawing the logic circuits and writing the truth table for multiple-gate systems, including XOR gates. | |
| Misconceptions | The misconception of ‘banter’ not being cyber bullying will be explored. | Binary conversion grid can be drawn the wrong way  (1 2 4 8…)  Students may struggle to comprehend the concept of bit depth. | Students may be familiar with ‘drag and drop’ website development tools, so may not understand the need for HTML or CSS. | | For loops – the terminating value is one lower than the number entered into the range.  Students will need to understand that >18 would mean integers 19 and over. | | Students may attempt to calculate totals instead of using formulae. The advantage of **automatic updates** to totals is given as a reason to use formulae. | WNICs may not be fully understood by students as they are often an integrated part of their devices. | | OR gates are often perceived as being either one or the other (it should include both), due to its use in the English language. This will be addressed using the example of a fire alarm system and multiple smoke sensors. | |
| Vocabulary and Comprehension | Cyber Bullying | Binary  Overflow  Pixel  File size  Compression | HTML  User Interface  Navigation  Website  Web form  Evaluation | | Print  Selection  Iteration  FOR loop  Variable  Categorisation | | SUM  Research  VLOOKUP  Conditional Formatting  Scenario  Testing | Input/Output  Processor  Storage  Memory  Network  Hardware | | Logic Gate  AND Gate  OR Gate  NOT Gate  XOR Gate | |
| C:\Users\meltynegate\Pictures\icons for booklet\glasses.pngLiteracy | 5 minutes of subject-specific reading time implemented into each lesson. | | | | | | | | | | |
| Image result for numeracy iconNumeracy |  | Binary to denary conversions requires multiplication and addition.  Binary addition requires use of addition skills. |  | | Number comparisons (> < etc.) are used in if statements and while loops. | | Mathematical operators used within formulae. | Multiplication to be used in calculating maximum overall clock speed. | | This links to mathematical function machines. | |
| Oracy | Students will be able to discuss what cyber bullying is as part of a group. |  | Students will be able to explain their design choices to their teacher and to their peers. | | Students will be able to explain syntax and logic errors seen in programs. | | Students will be able to explain their decisions while working through their “what if” scenarios. | Students to explain their choices of hardware. | |  | |
| Careers |  |  | Website design. | | Computer Programming. | | Accountancy | Systems design | |  | |
| Super Curricular Links |  |  |  | | Coding club | |  |  | |  | |
| British values  and SMSC | Social – safe and respectful online communication. | Cultural – an awareness of how computers work. | Social – Development of websites for meeting user needs. | |  | | Moral – the need for transparent accountancy. |  | |  | |
| Summative Assessment | Data representation and E-Safety. | | Web design, HTML, Data representation and E-Safety. | | Python, Web design, HTML, Data representation and E-Safety. | | | Hardware, Logic Gates, Python, Web design, HTML, Data representation and E-Safety. | | | |
| Scaffolding for LA | Structured guidance for developing online etiquette rules. | Conversion tables provided to support LA students. | Storyboard templates provided for LA students who need this additional structure. | | Syntax templates and examples provided for students. | | Support worksheets to guide students through using each skill provided. | LA students are provided a definitions list for each type of hardware to support their system design. | | Humour used to allow students to remember the diagrams (including a Toy Story reference). | |
| Challenge for HA  ✰ | Students will analyse ‘grey area’ online posts, concluding whether they class as cyber bullying. | GCSE questions as challenge.  Number of colours given instead of bit depth as challenge. | Students will be encouraged to aim towards the Distinction criteria for BTEC IT – fully annotated storyboards, multiple navigation methods, thorough testing and evaluation. | | Challenge tasks provided (to include projects from OCR GCSE Programming challenges). | | Students will be encouraged to format their spreadsheets well, with thorough testing and an evaluation which explores strengths and areas for further development. | HA students can explore cache (CPU) and will explore why the cores x clock speed calculation is not advertised as the clock speed. | | Multiple gate challenges from GCSE allow the HA students to be sufficiently stretched. | |