**Subject Year Curriculum Overview – A Level Computer Science (Year 2)**

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|  | **Autumn** | | **Spring** | | **Summer** | |
|  | **Learning Cycle 1** | **Learning Cycle 2** | **Learning Cycle 3** | **Learning Cycle 4** | **Learning Cycle 5** | **Learning Cycle 6** |
| **Topic** | **Theory:**  1.4.3 Boolean Algebra  2.1.1 Thinking abstractly  2.1.2 Thinking ahead  **Practical:**  NEA project | **Theory:**  2.1.3 Thinking procedurally  2.1.4 Thinking logically  2.1.5 Thinking concurrently  **Practical:**  NEA project | **Theory:**  2.2.1 Programming techniques  2.2.2 Computational methods  2.3.1 Algorithms  **Practical:**  NEA project | **Theory:**  1.5.1 Computing related legislation | **Theory:**  1.5.2 Moral and ethical issues | Revisit of topics |
| **Critical Prior Knowledge** | Computational thinking and logic gates | Identify the components of a problem. | Programming constructs: sequence, iteration, branching. | That there are a variety of laws relating to computing. | What morals and ethics are? | Overview from each topic |
| **Overall Intent**  **(Big ideas and key concepts)** | How abstraction can be used to help solve a problem.  That computers are made of digital circuits. | Understand the benefits of applying computational thinking to solving a wide variety of problems | How computers can be used to solve problems and programs can be written to solve them. | What the role of the different laws are and the part they play within society. | The individual moral, social, ethical and cultural opportunities and risks of digital technology | Review the links between each of the topics. |
| **Essential**  **Knowledge milestones**  **(What students must master)** | The different logic gates and associated truth tables.  Boolean laws and identities. | Determine the order of the steps needed to solve a problem.  Determine the parts of a problem that can be tackled at the same time. | Use of an IDE to develop/debug a program. | (a) The Data Protection Act 1998. (b) The Computer Misuse Act 1990. (c) The Copyright Design and Patents Act 1988. (d) The Regulation of Investigatory Powers Act 2000. | How the topic effects the following:  Computers in the workforce.  Censorship and the Internet. Piracy and offensive communications. | Developing knowledge and application. |
| **Cultural Capital** | Many real-world objects and situations are represented in computer systems. Using abstraction correctly will help identify and remove the unnecessary detail to solve a problem. | Links to programming project and other options for ways of thinking within solving any problem. | How these techniques have been used to make programs and solve problems | How these laws fit into society. Real case studies | Case studies of real effects within the world. | How what they know relates to many areas outside of the subject. |
| **Assessment Points** | Problem solving using abstraction. | Using the techniques outline to solve a variety of different problems. Programming project. | Using the techniques outline to solve a variety of different problems. Programming project | Quizzes and essay based questions. | Quizzes and essay based questions. | Quizzes and exam based questions. |
| **ECC Student Characteristics** | H&S = Healthy and safe  **R =** **Resilient learners including activities beyond the classroom**  **Car = Careers and aspirations**  R&B = Respect and good behaviours  **CCS = Confidence and communication skills (including literacy, numeracy, extended writing, reading and listening**  CED = Mutual tolerance and awareness of cultures, equality and diversity | H&S = Healthy and safe  R = **Resilient learners including activities beyond the classroom**  **Car = Careers and aspirations**  R&B = Respect and good behaviours  **CCS = Confidence and communication skills (including literacy, numeracy, extended writing, reading and listening**  CED = Mutual tolerance and awareness of cultures, equality and diversity | H&S = Healthy and safe  R = **Resilient learners including activities beyond the classroom**  **Car = Careers and aspirations**  R&B = Respect and good behaviours  **CCS = Confidence and communication skills (including literacy, numeracy, extended writing, reading and listening**  CED = Mutual tolerance and awareness of cultures, equality and diversity | H&S = **Healthy and safe**  R = **Resilient learners including activities beyond the classroom**  **Car = Careers and aspirations**  **R&B = Respect and good behaviours**  **CCS = Confidence and communication skills (including literacy, numeracy, extended writing, reading and listening**  **CED = Mutual tolerance and awareness of cultures, equality and diversity** | **H&S = Healthy and safe**  **R = Resilient learners including activities beyond the classroom**  **Car = Careers and aspirations**  **R&B = Respect and good behaviours**  **CCS = Confidence and communication skills (including literacy, numeracy, extended writing, reading and listening**  **CED = Mutual tolerance and awareness of cultures, equality and diversity** | H&S = Healthy and safe  R = **Resilient learners including activities beyond the classroom**  **Car = Careers and aspirations**  R&B = Respect and good behaviours  **CCS = Confidence and communication skills (including literacy, numeracy, extended writing, reading and listening**  **CED = Mutual tolerance and awareness of cultures, equality and diversity** |
| **Connection to future learning**  **(When is this developed / revisited)?** | Application to programming project | Application to programming project and the different ways of thinking to solve problems. | Application to all areas within the programming project and the different aspects of programming within the future cycles. | Linked to learning cycle 5 and revisited. | Links to cycle 6. |  |