

## Subject: Computer Science

### What students are learning through Year 10 and Year 11:

	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Year 10	<p><b><u>1: Systems Architecture</u></b></p> <p><b>1.1.1</b> The CPU's Purpose CPU Components Von Neumann Architecture</p> <p><b><u>1: Algorithms</u></b></p> <p><b>2.1.1</b> Computational Thinking: Abstraction, Decomposition, Algorithmic Thinking</p> <p><b>2.1.2</b> Identify: Inputs Processes Outputs Create: Pseudocode Flow Charts</p>	<p><b><u>2: Memory &amp; Storage</u></b></p> <p><b>1.2.1</b> Primary Storage RAM, ROM Virtual</p> <p><b>1.2.2</b> Secondary Storage Common Types Devices Advantages Disadvantages</p> <p><b>1.2.5</b> Compression: Lossy &amp; Lossless</p> <p><b><u>2: Programming Fundamentals</u></b></p> <p><b><u>Composite</u></b></p> <p><b>2.2.1</b> Seq – Sel – Iterate Variables Constants Inputs Outputs Assignments Arithmetic Ops Boolean Ops Comparison Ops</p> <p><b>2.2.2</b> Data Types: Integer Real / Float Boolean Character String Casting</p>	<p><b><u>3: Networks &amp; 4: Security</u></b></p> <p><b>1.3.1</b> Types of Networks LAN &amp; WAN Performance Client Server Peer to Peer LAN Hardware The Internet Topologies</p> <p><b>1.4.1</b> Forms of attack Malware Social Engineering Brute Force DOS, SQL</p> <p><b><u>3: Producing Robust Programs</u></b></p> <p><b>2.3.1</b> Defensive Design Misuse Authentication Input Validation Maintainability Comments Naming, Indents</p>	<p><b><u>5: System Software</u></b></p> <p><b>1.5.1</b> Operating Systems Purpose &amp; Functionality User management File management</p> <p><b><u>4: Boolean Logic</u></b></p> <p><b><u>Composite</u></b></p> <p><b>2.4.1</b> Logic Operators: AND OR NOT Truth Tables Combine operators. AND – OR NOT – AND etc. Using operators in truth tables to solve problems.</p>	<p><b><u>6: Ethical, Legal, Cultural</u></b></p> <p><b>1.6.1 (part 1)</b> Impacts of digital technology: <b><u>Issues</u></b> Ethical Legal Cultural Environmental Privacy</p> <p><b><u>5: Programming Languages IDE</u></b></p> <p><b>2.5.1</b> Languages High-level Low-level Translators Compilers Interpreters</p>	<p><b><u>1: System Architecture</u></b></p> <p><b>Recap: 1.1.1</b></p> <p><b>1.1.2</b> CPU Performance Clock Speed Cache Size Number of cores</p> <p><b>1.1.3</b> Embedded Systems Purpose Characteristics Examples</p> <p><b><u>1: Algorithms</u></b></p> <p><b><u>Composite</u></b></p> <p><b>Recap 2.1.1, 2.1.2</b></p> <p><b>2.1.2</b> Identify: Common errors Create: Trace tables</p> <p><b>2.1.3</b> Search Algorithms Binary and Linear Sort Algorithms: Bubble, Merge and Insertion</p>

<p>Year 11</p>	<p><b>2: Memory &amp; Storage</b>  <b>Recap: 1.2.1, 1.2.2, 1.2.5</b>  <b>1.2.3</b>  Units of data storage: bits to PB  Data capacity  <b>1.2.4</b>  Binary Numbers  Conversion  Addition  Hexadecimal  Shifts  Binary Characters: ASCII &amp; Unicode  Binary Images: pixels, colour depth  Binary Sound: quality and size</p> <p><b>2: Programming Fundamentals Composite</b>  <b>Recap 2.2.1, 2.2.2</b>  <b>2.2.3</b>  String Manipulation  File Handling:  Open  Write  Read  Close  Records &amp; SQL  Arrays: 1D &amp; 2D  Sub programs:  Functions  Procedures  Random Generator</p>	<p><b>3: Networks &amp; 4: Security</b>  <b>Recap: 1.3.1, 1.4.1</b>  <b>1.3.2</b>  Wired and Wireless  Encryption  Addressing  Protocols  Layers  <b>1.4.2</b>  Prevention</p> <p><b>3: Producing Robust Programs Composite</b>  <b>Recap: 2.3.1</b>  <b>2.3.2</b>  Testing  Iterative &amp; Final  Syntax Errors  Logic Errors  Test Data:  Normal  Boundary  Erroneous / Invalid  Refining Algorithms</p>	<p><b>5: System Software</b>  <b>Recap: 1.5.1</b>  <b>1.5.2</b>  Utility Software  Encryption  Defragmentation  Data Compression</p> <p><b>4: Boolean Logic</b>  <b>Recap 2.4.1</b>  <b>EXTENDED:</b>  A LEVEL  Boolean Operators:  AND  OR  NOT  <b>NAND</b>  <b>NOR</b>  <b>XOR</b>  Combining operators  Truth Tables</p>	<p><b>6: Ethical, Legal, Cultural</b>  <b>Recap 1.6.1 (part 1)</b>  <b>1.6.1 (part 2)</b>  Legislation  - Data Protection Act 2008  - Computer Misuse Act 1990  - Copyright, Designs and Patents Act 1988  - Software licenses: open source vs proprietary</p> <p><b>5: Programming Languages / IDE</b>  <b>Recap 2.5.1</b>  <b>2.5.2</b>  The Integrated Development Environment (IDE)  Common tools and facilities  Editor's  Error diagnostics  Run-time environment  Translators</p>	<p><b>Programming Project</b>  20 Hours:  OCR to release brief, will be done without internet aid to solve a problem using Python IDE.</p> <p><b>Exam</b></p>	
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