

## Year 10 Computer Science Curriculum Map

|  | Autumn Term  | Spring Term  | Summer Term   |
|--|--|--|---|
| Unit Length  | 15 weeks   | 12 weeks   | 13 weeks  |
| Links to the National curriculum/Assessment Objectives                               | <ul style="list-style-type: none"> <li>• AO1: Understand how to calculate between Binary, Hexadecimal and Denary</li> <li>• AO2: Know each unit of measurement up to petabyte</li> <li>• AO3: Understand how to add Binary representation</li> <li>• AO4: Character encoding a given set of characters</li> <li>• AO5: Calculate the file size from a given image</li> <li>• AO6: Understand how sound is converted into digital representation</li> <li>• AO7: Character encoding a given set of characters</li> <li>• AO8: Understand Huffman trees and RLE Compression</li> </ul>   | <ul style="list-style-type: none"> <li>• AO1: Understand data types and why they are used</li> <li>• AO2: Arithmetic understanding of common operators</li> <li>• AO3: Apply relational and Boolean operators within programming</li> <li>• AO4: Trace and construct data structures</li> <li>• AO5: Use input and output functions within programming</li> <li>• AO6: Know how to manipulate strings</li> <li>• AO7: Use subroutines within different programming concepts</li> </ul>   | <p>AO1: Construct truth tables for AND, OR and NOT.<br/>           AO2: Create, modify and interpret simple logic circuit diagrams.<br/>           AO3: Explain what is meant by:</p> <ul style="list-style-type: none"> <li>• system software</li> <li>• application software.</li> </ul> <p>AO4: Explain the effect of the following on the performance of the CPU<br/>           AO6: Understand and explain the Fetch-Execute cycle.<br/>           AO7: Understand the differences between main memory and secondary storage<br/>           AO8: Understand why secondary storage is required<br/>           AO9: Be aware of different types of secondary storage (solid state, optical and magnetic)</p> |
| Description of the topic and key learning outcomes (key knowledge and understanding) | <p><b>Module 1: Data Representation</b><br/> <b>Binary representation of data within all digital devices and networks.</b></p> <p>The topics areas covered are:</p> <ol style="list-style-type: none"> <li>1. Number bases</li> <li>2. Converting between number bases</li> <li>3. Units of measurement</li> <li>4. Binary Arithmetic</li> <li>5. Character Encoding</li> <li>6. Representing Images</li> <li>7. Representing Sound</li> <li>8. Data Compression</li> </ol> <p><b>Module 2: Programming</b></p> <ol style="list-style-type: none"> <li>9. Representing Algorithms</li> <li>10. Data Types</li> <li>11. Programming Concepts               <ul style="list-style-type: none"> <li>* Variables</li> <li>* Selection</li> </ul> </li> </ol> | <p><b>Module 2: Programming</b><br/> <b>Covering the basic concepts of variables, iteration, arrays, input/Output, strings and subroutines.</b></p> <p>The topic areas covered are:</p> <ol style="list-style-type: none"> <li>1. Arithmetic Operations in a programming language</li> <li>2. Relational Operations in a programming language</li> <li>3. Boolean operations within a programming language</li> <li>4. Data Structures</li> <li>5. String handling Operations</li> <li>6. Subroutines</li> <li>7. Binary &amp; Linear Search</li> <li>8. Bubble Sort &amp; Merge Sort</li> </ol> | <p><b>Module 5: Computer Systems</b><br/> <b>Boolean logic in the form of diagrams and truth table and different aspects of systems architecture</b></p> <p>The topic areas covered are:</p> <ol style="list-style-type: none"> <li>9. Boolean logic diagrams and truth tables</li> <li>10. System software an Application software</li> <li>11. CPU performance</li> <li>12. FDE Cycle</li> <li>13. Memory and secondary storage</li> <li>14. Solid state, Optical and Magnetic</li> </ol>   |

|  |   |   |   |
|--|---|---|---|
|  | * Iteration Loops   |   |   |
| <b>Related Concepts (that are revisited)</b> | Binary representation / Hexadecimal representation/ Conversion between bases/ Sound measurement and digital representation / Image measurement and image representation/  | Variables, Selection, types of Iteration, / Use of different operators, arrays and string manipulation/ practical skills in error handling and evidencing work.   | Boolean logic, FDE cycle – facts and diagrammatic / Hardware circuit boards   |
| <b>Skills being taught</b>                   | Formula manipulation, displaying calculations, exam interpretation, Sound knowledge, Image Knowledge, Compression knowledge, Encoding.  | Error handling, construction of counter controlled loops, re-peat until, while loops and for-loops. Variable manipulation, using of different operators in different scenarios. Breakdown of a given problem and translating this into a solution.  | Memorising facts and relating the facts with diagrams.  |
| <b>Milestone assessments</b>                 | <ul style="list-style-type: none"> <li>• AO1: Understand how to calculate between Binary, Hexadecimal and Denary</li> <li>• AO3: Understand how to add Binary representation</li> </ul>   | <ul style="list-style-type: none"> <li>• AO4: Trace and construct data structures</li> <li>• AO5: Use input and output functions within</li> </ul>  | <p>AO1: Construct truth tables for AND, OR and NOT.<br/> AO2: Create, modify and interpret simple logic circuit diagrams.<br/> AO3: Explain what is meant by:</p> <ul style="list-style-type: none"> <li>• system software</li> <li>• application software.</li> </ul>  |
| <b>Wider reading</b>                         | <p style="text-align: center;"> <a href="https://www.bbc.co.uk/bitesize/examspecs/zkwsjhw">https://www.bbc.co.uk/bitesize/examspecs/zkwsjhw</a><br/> <a href="https://senecalearning.com/en-GB/blog/gcse-computer-science-revision/">https://senecalearning.com/en-GB/blog/gcse-computer-science-revision/</a> </p>                       |   |   |
| <b>Literacy programme</b>                    | <ul style="list-style-type: none"> <li>• Increase vocabulary with emphasis on keywords within Computer science.</li> <li>• Use tier 1, 2 and 3 words to increase their vocabulary knowledge</li> <li>• Embed deliberate practice questions within tasks. Use past exam papers as a guid to write deliberate practice questions</li> </ul> | <ul style="list-style-type: none"> <li>• Increase vocabulary with emphasis on keywords within Computer science.</li> <li>• Use tier 1, 2 and 3 words to increase their vocabulary knowledge</li> <li>• Embed deliberate practice questions within tasks. Use past exam papers as a guid to write deliberate practice questions</li> </ul> | <ul style="list-style-type: none"> <li>• Increase vocabulary with emphasis on keywords within Computer science.</li> <li>• Use tier 1, 2 and 3 words to increase their vocabulary knowledge</li> <li>• Embed deliberate practice questions within tasks. Use past exam papers as a guid to write deliberate practice questions</li> </ul> |

|  |   |  |   |
|--|---|--|---|
| <b>Homework / Independent Learning Tasks</b> | 1. Log into HAPS from the school website download the resources and start the deliberate practice questions   | 2. Use <a href="http://www.online-python.com">www.online-python.com</a> to run and execute your code. Practice the basic concepts.   | 3. Use Logic.ly to run and execute your logic gate design. Practice using AND, OR and NOT.  |
| <b>Oak Academy Links</b>                     | <a href="https://classroom.thenational.academy/units/data-representation-618b">https://classroom.thenational.academy/units/data-representation-618b</a> | <a href="#">Programming 1: Sequence - Oak National Academy (thenational.academy)</a><br><a href="#">Programming 2: Selection - Oak National Academy (thenational.academy)</a><br><a href="#">Programming 3: Iteration - Oak National Academy (thenational.academy)</a><br><a href="#">Programming 4: Subroutines - Oak National Academy (thenational.academy)</a><br><a href="#">Programming 5: Strings and lists - Oak National Academy (thenational.academy)</a> | <a href="https://classroom.thenational.academy/units/computer-systems-e17a">https://classroom.thenational.academy/units/computer-systems-e17a</a> |