



Intent for the Year – GCSE Computer Science Curriculum 2020-2021

In Computer Science, we aim to provide an inspirational experience for every student in a safe and purposeful learning environment that is relevant, exciting and reflective in order for every student to be confident in their use of technology and equip them for future learning and careers in technology.

Implementation:

Students experience opportunities to all increase their understanding of how computers work, the changes in modern technology, as well as develop an understanding of the importance of a qualification in Computing as a gateway to future learning and improved life chances. Students will see how a computer works and be able to explain all components of a computer system, to investigate a network and explore aspects of how a network functions. Students will also learn how to program in python and become increasingly independent in programming and logical thinking.

| Term | Enquiry/Topic/Unit: <i>What is going to be taught?</i> | Key Outcomes: <i>What will students have achieved by completing this scheme of learning?</i> | Character Education: <i>How does this topic link to a sense of Self, Others and the World, in terms of Character Education?</i> | Assessment: <i>Will there be formative and/or summative testing? What role will interleaving play?</i> | Vocabulary: <i>What are the key words for this topic/unit that students must know?</i> | Home-Learning: <i>What homework will be set and why (e.g. consolidate/extend)?</i> |
|-------------|---|--|--|--|--|---|
| 1a | Algorithms Boolean Logic Programming concepts | Drawing flow charts Sequence / selection / iteration Writing pseudocode Searching and Sorting algorithms Logic Gates – AND/OR/NOT Truth tables Print Variables / constants Indentation If/elif/else Cast datatypes | Resilient Confident Curious Reflective | Homework sheets checking on understanding / practising algorithms for coding. Mini test on algorithms Mini test on Logic Yr 10 January Assessment | Sequence Selection Iteration Decomposition Abstraction Computational Thinking Pseudocode Variable Cast And Or Not Print Input If Else Elif | Homework sheets alternately checking on understanding of theory and practising algorithms for coding. |
| 1b | Systems Architecture | Purpose of CPU Identify & explain components of CPU | Resilient Confident | Homework sheets checking on understanding / practising algorithms for coding. | CPU CU ALU | Homework sheets alternately checking on understanding of |



Haygrove School Department Curriculum Overview 2020-2021

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| | <p>Memory</p> <p>Programming concepts</p> | <p>Explain in detail fetch-decode-execute cycle Explain Embedded Systems</p> <p>Explain what is RAM/ROM Understand differences of RAM/ROM Analyse impact of ROM Explain virtual memory and its effects Explain flash memory inc cache</p> <p>To be confident in using iteration – For / While Use nested iteration Become confident in pseudocode</p> | <p>Curious</p> <p>Reflective</p> | <p>Mini test on systems architecture</p> <p>Mini test on Memory</p> <p>Yr 10 January Assessment</p> | <p>MAR/ MDR Registers Fetch Decode Execute RAM ROM Cache Virtual memory Computational Thinking Pseudocode For While Nested loops</p> | <p>theory and practising algorithms for coding.</p> <p>Revision activities for January assessment.</p> |
| 2a | <p>Secondary Storage</p> <p>Programming concepts</p> | <p>Identify, explain and understand what is meant by secondary storage. Explain why secondary storage is needed. Identify and describe the three types of secondary storage Describe characteristics of the above including advantages and disadvantages Estimate data capacity for different file type</p> <p>Set up and use arrays up to 2 dimensions Find the length of an array, resize or copy arrays Concatenate arrays</p> | <p>Resilient</p> <p>Confident</p> <p>Curious</p> <p>Reflective</p> | <p>Homework sheets checking on understanding / practising algorithms for coding.</p> <p>Mini test on secondary storage</p> | <p>Solid state Optical Magnetic Portability Capacity Durability Robustness Battery life Computational Thinking Pseudocode Array Concatenate Cast</p> | <p>Homework sheets alternately checking on understanding of theory and practising algorithms for coding.</p> |



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| <p>2b</p> | <p>Data representation</p> <p>Programming concepts</p> | <p>Identify all units eg bit, nibble, byte... Know why a computer uses binary Convert positive numbers to and from binary and hexadecimal Calculate binary shifts Explain the use of a check digit Describe and use character sets Show how images and sound are digitalised. Describe metadata Explain sound sampling and its effects.</p> <p>Use arrays up to 2 dimensions Find the length of an array, resize or copy arrays Concatenate arrays</p> | <p>Resilient</p> <p>Confident</p> <p>Curious</p> <p>Reflective</p> | <p>Homework sheets checking on understanding / practising algorithms for coding.</p> <p>Mini test on data representation</p> | <p>Bit Byte Nibble Kilobyte Megabyte Gigabyte Terabyte Transistor Denary Binary Hexadecimal Sample Interval Metadata Character set / ASCII/Unicode Amplitude Computational Thinking Pseudocode Array Concatenate Cast</p> | <p>Homework sheets alternately checking on understanding of theory and practising algorithms for coding.</p> |
| <p>3ab</p> | <p>Wired and Wireless and Virtual networks</p> <p>Network Topologies, Protocols and Layers</p> | <p>Why a network? Identify and explain LAN, WAN, virtual networks, peer-peer, client-server Explain structure of the above Identify components needed for above Explain factors that affect performance Explain the role of the DNS, hosting, cloud</p> <p>Identify and explain 4 main types of topology, including</p> | <p>Resilient</p> <p>Confident</p> <p>Curious</p> <p>Reflective</p> | <p>Homework sheets checking on understanding / practising algorithms for coding.</p> <p>Mini test on Wired and Wireless and Virtual networks</p> <p>Mini test on Network Topologies, Protocols and Layers</p> | <p>LAN WAN VAN PAN VLAN Network Peer-to-peer Client- server DNS Cloud VPN Host Topology Ring Star</p> | <p>Homework sheets alternately checking on understanding of theory and practising algorithms for coding.</p> <p>Revision activities for June assessment.</p> |



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| | Programming concepts | <p>advantages and disadvantages</p> <p>Explain differences between wi-fi and Ethernet</p> <p>Explain encryption</p> <p>Explain IP, MAC addresses and protocols</p> <p>Understand and name protocols and layers</p> <p>Explain concept of packet switching</p> <p>To break down programs into subprograms such as functions and procedures.</p> <p>Create, run and test functions and procedures.</p> <p>Open, read, write and close external files as part of a bigger main program.</p> | | | <p>Bus</p> <p>Mesh</p> <p>Ethernet</p> <p>Wi-fi</p> <p>Encryption</p> <p>Cipher</p> <p>Layer</p> <p>Protocol</p> <p>Packet switching</p> <p>Function</p> <p>Procedure</p> <p>External file</p> | |
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Impact:

GCSE – to focus on students understanding topics for GCSE exam and understanding changes in technology relevant to their life choices and future careers.