# BBG Academy Curriculum 2025-2026 – Computer Science

This document contains details of how the subject is sequenced over the years of delivery. Included are assessment points and the prior learning that will be included in these assessments. It also includes where topics are revisited to maximise student retrieval and retention. Along with curriculum content, opportunities to develop links with careers are also identified in order to bring the relevance of the curriculum into the wider life context.

## Curriculum Intent Statement

The Computing department offers a varied curriculum providing students with lots of opportunities to develop both academically and personally. We deliver valuable academic rigour across all courses whilst providing students with opportunities to gain and enhance vital employability skills. By allowing students to actively engage in a variety of learning experiences, we hope to support all students to develop into well rounded individuals ready for the next step of their academic and career journey.

## Year 10/11

## GCSE assessment dates

Assessment week 1 – 06.10.2025

Assessment week 2 – 12.01.2026

Assessment week 3 – 23.03.2026 (In class)

| Term | Content | Sequencing | Assessment | Careers links & Experiences | Vocabulary | Misconceptions |
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| **Term X June – July (3 weeks)** | 1.1 Introduction lesson – About the course<br>· Understand the course structure and appreciate how you will be taught and assessed in this subject.<br>· Understand the importance of the flipped classroom approach.<br>SLR 1.1 – Lesson 1, Architecture of the CPU<br>· Understand what the CPU of a computer does.<br>· Know what the registers in a CPU are.<br>· Know the stages of the fetch, execute cycle.<br>· Know about other components of the CPU. | **Previous topics built on in this topic:**<br>Year 9 Content where applicable | **Formative Assessments:**<br><br>SLR 1.1 Unit Test | AI Careers<br>ICT Technician | CPU<br>Architecture<br>Embedded Systems<br>Registers<br>ALU<br>CU<br>MDR<br>MAR<br>Accumulator<br>PC | Thinking the CPU only executes programs rather than fetching and decoding them<br><br>Confusing the role of MAR and MDR |

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| | KEY QUESTION:<br>What is the “architecture” of a CPU?<br>SLR 1.1 – Lesson 2, Architecture of the CPU<br>· Describe the von Neumann architecture.<br>· Know the components of the von Neumann architecture.<br>· Understand what a keyword is.<br>KEY QUESTION:<br>What is the “architecture” of a CPU?<br>SLR 1.1 – Lesson 3, How common characteristics of CPUs affect their performance<br>· Understand three ways in which the speed of a CPU – and therefore, the speed of a computer – can be increased.<br>· Begin learning how to program.<br>KEY QUESTION:<br>What factors affect CPU performance?<br>SLR 1.1 – Lesson 4, Embedded systems<br>· Understand what is meant by the term embedded system.<br>· Know several examples of embedded systems.<br>· Understand how to program.<br>KEY QUESTION:<br>What are embedded systems, and what are their characteristics?<br><br>Independent programming<br>Gain experience in practical programming | | | | | |
| **Autumn 1 Aug to Sep (4 weeks)** | SLR 1.2 – Lesson 1, RAM and ROM· Understand the need for primary storage<br>· Know the difference between RAM and ROM. | **Previous topics built on in this topic:**<br>Year 9 Content where applicable | **Formative assessment:** | ICT Technician | RAM, ROM, Virtual Memory Secondary Storage | Confusing RAM and ROM roles<br><br>Thinking RAM stores data permanently |

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| | · Know the purpose of ROM in a computer system.<br>· Know the purpose of RAM in a computer system.<br>· Understand how to program.<br>KEY QUESTION:<br>Why do computers have primary storage?<br>SLR 1.2 – Lesson 2, Virtual memory· Understand the need for virtual memory.<br>· Understand how to program.<br>KEY QUESTION:<br>How does virtual memory work?<br><br>SLR 1.2 – Lesson 3, Common types of storage· Understand the need for secondary storage.<br>· Know the common types of storage.<br>· Know the characteristics of storage devices.<br>· Understand how to program.<br>KEY QUESTION:<br>Why do computers have secondary storage?<br>SLR 1.2 – Lesson 4, Common types of storage· Know the characteristics of storage devices.<br>· Understand how to program.<br>KEY QUESTION:<br>What are the differences between secondary storage devices?<br><br>SLR 1.2 – Lesson 5, Application storage<br>· Understand the suitability of storage devices for given applications. | | Interleaving Quizzes<br><br>Mock 1: 06.10.2026 | | | Believing ROM can be written to during normal operation<br><br>Believing virtual memory is an extra form of RAM<br><br>Assuming virtual memory increases processing power<br><br>Confusing virtual memory with virtual reality<br><br>Thinking secondary storage is only used when primary storage is full<br><br>Assuming SSDs never fail<br><br>Confusing storage type with memory<br><br>Believing the cheapest device is always best<br><br>Assuming capacity is the only factor in choosing a device |

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| | · Understand the advantages and disadvantages of devices based on their characteristics.<br>· Understand how to program.<br>KEY QUESTION:<br>What features of secondary storage make devices suitable for different situations?<br><br>Independent programming<br>Gain experience in practical programming | | | | | |
| **Autumn1 Sep – Oct (4 weeks)** | SLR 1.2 – Lesson 6, Units· Understand what is meant by the terms bit, nibble, byte, kilobyte, megabyte, gigabyte, terabyte and petabyte.<br>· Understand how to represent the capacity of data storage using these units and convert between them.<br>· Understand that data needs to be converted into a binary format to be processed by a computer.<br>KEY QUESTION:<br>Why is data stored in binary?<br>SLR 1.2 – Lesson 7, Data capacity and calculation of requirements<br>· Know what data capacity means.<br>· Understand how to calculate data capacity requirements.<br>· Understand how to program.<br>KEY QUESTION:<br>How do you calculate data capacity?<br>SLR 1.2 – Lesson 8, Binary conversion and addition<br>· Know how to convert positive denary whole numbers (0 – 255) to 8-bit binary and vice versa.<br>· Know how to add two 8-bit binary integers. | **Previous topics built on in this topic:**<br>Year 9 Content where applicable (Networking)<br><br>Year 7 content for binary conversion, character sets, | **Consolidation/Summative assessment:**<br><br>SLR 1.2 Test<br>SLR 1.3 Test<br>Interleaving<br>Quizzes | Programming<br>Technical<br>Positions<br>Networking | Bit<br>Byte<br>Capacity<br>Nibble<br>KB – PB<br>Denary<br>Binary<br>Hexadecimal<br>Metadata<br>Colour Depth<br>Resolution<br>Pixel<br>Bit Depth<br>Sample Rate<br>Compression | Confusing 1000 with 1024 for conversion<br>Thinking MB and MiB are the same<br>Believing 'nibble' is outdated or unused |

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| | · Understand the terms most/least significant bit.<br>· Understand how overflow errors occur.<br>KEY QUESTION:<br>What can happen to the most significant bit when you add two binary numbers together?<br>SLR 1.2 – Lesson 9, Binary shift and hexadecimal<br>· Know how to perform a left and right binary shift.<br>· Understand what a binary shift achieves.<br>· Know how to convert positive denary whole numbers (0 – 255) into 2-digit hexadecimal and vice versa.<br>· Know how to convert from binary to hexadecimal equivalents and vice versa.<br>KEY QUESTION:<br>What is the relationship between denary, binary and hexadecimal?<br>KEY QUESTION:<br>How do computers store and use numbers?<br><br>SLR 1.3 – Lesson 1, Types of networks<br>· Know what is meant by 'stand-alone' computers.<br>· Know the different types of networks: LAN and WAN.<br>· Understand the advantages of networking.<br>· Understand the implications of networking.<br>· Understand how to program.<br>KEY QUESTION:<br>What are the characteristics of LANs and WANs?<br>SLR 1.3 – Lesson 2, Factors that affect the performance of networks<br>· Know what factors affect the performance of networks. | | | | | Confusing LAN and WAN based on size only<br><br>Thinking peer-to-peer is the same as client-server<br><br>Assuming the internet is a single large LAN<br><br>Confusing switches and hubs<br><br>Assuming all hardware is required for every network |

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| | · Understand how to program.<br>KEY QUESTION:<br>What can affect the performance of a network?<br>SLR 1.3 – Lesson 3, Client-server and peer-to-peer<br>· Know what a client-server model is.<br>· Know what a peer-to-peer model is.<br>· Understand the different roles computers have in each model.<br>KEY QUESTION:<br>What are the differences between peer-to-peer and client-server networks?<br>SLR 1.3 – Lesson 4, Hardware for a LAN<br>· Know the hardware needed to connect a LAN.<br>· Understand the purpose of each piece of hardware.<br>KEY QUESTION:<br>How do you set up a LAN?<br>SLR 1.3 – Lesson 5, the internet<br>· Understand what the internet is.<br>· Understand the term DNS (Domain Name Server).<br>· Understand what is meant by the term hosting.<br>· Understand what is meant by the term cloud.<br>· Understand what is meant by the terms web server and client.<br>KEY QUESTION:<br>How does the internet work?<br>SLR 1.3 – Lesson 6, Catch up lesson<br>· Complete any outstanding work to this point.<br>KEY QUESTION: | | | | | Thinking WAP and router are the same<br><br>Believing the internet and the web are the same<br><br>Thinking DNS is only for websites<br><br>Assuming cloud services store data “in the sky”<br><br>Thinking mesh networks are always faster<br><br>Assuming every device connects to every other in practice<br><br>Forgetting that most mesh networks are partial<br><br>Thinking wired is always better<br><br>Confusing Wi-Fi with the internet<br><br>Assuming Bluetooth can replace Wi-Fi<br><br>Thinking MAC and IP addresses are interchangeable<br><br>Believing encryption makes data unreadable forever |

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| | How does the internet work?<br>SLR 1.3 – Lesson 7, Star and mesh network topologies<br>· Know what a star network is.<br>· Know what a mesh network is.<br>· Understand the internet is an example of a partial mesh network.<br>· Know the advantages and disadvantages of star and mesh networks.<br>· Understand how to program.<br>KEY QUESTION:<br>Why is a mesh network better than a star network?<br>SLR 1.3 – Lesson 8, Modes of connection<br>· Understand that Ethernet is a wired method of connection.<br>· Understand that Wi-Fi and Bluetooth and wireless method of connection.<br>· Understand the benefits and drawbacks of wired versus wireless connections.<br>· Be able to commend a connection type for a given scenario.<br>KEY QUESTION:<br>Which is better, a wired or wireless network?<br>SLR 1.3 – Lesson 9, Wi-Fi encryption· Know the basics of how cryptography can work with a simple key.<br>· Know how wireless devices authenticate with each other before communicating data.<br>· Understand the difference between a private key and public keys.<br>· Understand why private (master) keys are never shared.<br>· Understand how to program.<br>KEY QUESTION: | | | | LAN<br>WAN<br>Performance<br>Topology<br>Star<br>Mesh<br>Client Server<br>Peer to Peer<br>Switch<br>Hub<br>Router<br>Wireless Access Point<br>DNS<br>IP Address<br>MAC Address | Confusing IP version differences with speed<br><br>Believing one protocol handles everything<br><br>Thinking the OSI and TCP/IP models are the same<br><br>Assuming protocols don't affect performance<br><br>Confusing LAN and WAN based on size only<br><br>Thinking peer-to-peer is the same as client-server<br><br>Assuming the internet is a single large LAN<br><br>Confusing switches and hubs<br><br>Assuming all hardware is required for every network<br><br>Thinking WAP and router are the same<br><br>Believing the internet and the web are the same<br><br>Thinking DNS is only for websites<br><br>Assuming cloud services store data "in the sky" |

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| | What is the purpose of encryption?<br>SLR 1.3 – Lesson 10, IP and MAC addressing<br>•Understand the uses of MAC and IP addressing.<br>•Understand the difference between IPv4 and IPv6.<br>•Understand the need for IPv6.<br>•Understand how to program.<br>KEY QUESTION:<br>What are the differences between the three types of network device address?<br>SLR 1.3 – Lesson 11, Standards and common protocols<br>•Understand the need for standards in computing.<br>•Understand the 7 common protocols and what they are used for.<br>•Understand how to program.<br>KEY QUESTION:<br>What are standards and protocols?<br>SLR 1.3 – Lesson 12, The concept of layers<br>•Know why protocols are layered.<br>•Understand how to program.<br>KEY QUESTION:<br>What are the benefits of layering protocols? | | | | | Thinking mesh networks are always faster<br><br>Assuming every device connects to every other in practice<br><br>Forgetting that most mesh networks are partial<br><br>Thinking wired is always better<br><br>Confusing Wi-Fi with the internet<br><br>Assuming Bluetooth can replace Wi-Fi<br><br>Thinking MAC and IP addresses are interchangeable<br><br>Believing encryption makes data unreadable forever<br><br>Confusing IP version differences with speed<br><br>Believing one protocol handles everything<br><br>Thinking the OSI and TCP/IP models are the same<br><br>Assuming protocols don't affect performance |

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| | | | | | | Cloud Storage is magic.<br><br>Most meshes are partial meshes.<br><br>Most meshes are now wireless.<br><br>IP and MAC addresses are the same. |
| **Autumn 1**<br>**Oct**<br>**(1 weeks)**<br><br>**(1 week)** | 2.1 – Lesson 1, Abstraction, Decomposition, Algorithms, Computational Thinking<br>•Know what is meant by the term 'abstraction'.<br>•Know some examples of abstraction.<br>KEY QUESTION:<br>What are the principles of computational thinking?<br>•Know what is meant by the term 'abstraction'.<br>•Know some examples of abstraction<br>KEY QUESTION:<br>What are the principles of computational thinking?<br>•Know what is meant by problem decomposition.<br>•Know the advantages of decomposition when applied to programming.<br>•Know an example of problem decomposition.<br>•Know how to produce a structure diagram to aid in decomposing a problem.<br>KEY QUESTION:<br>What is the purpose of decomposition, and how can producing structure diagrams help?<br>•Understand how to solve computational problems by applying algorithmic thinking.<br>KEY QUESTION:<br>What do we mean by "thinking algorithmically"?<br>SLR 2.1 – Lesson 5, Algorithmic thinking<br>Add a recap of the programming constructs from Year 9 (Sequence, Selection, Iteration)<br><br>Revision Time 1.1 – 1.3, Part 2.1 and 2.2 | **Previous topics built on in this topic:**<br><br>Intro to Programming<br>1 & 2 markers to cover all previous topics. | Assessment week 1 – 06.10.2025<br><br>Sixaday Interleaving Interleaving Questions through quizzing | Programming | 2.1 Part One<br>Computational Thinking<br>Algorithm<br>Abstraction<br>Decomposition<br>Sequence<br>Selection<br>Iteration | Confusion between terms |

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| **Autumn 2**<br>**Nov -Dec**<br>**(6 weeks)** | SLR 1.4 – Lesson 1, Forms of attack<br>•Understand the different forms of attack carried out on computer systems.<br>KEY QUESTION:<br>What are the threats to devices and computers?<br>SLR 1.4 – Lesson 2, Threats posed to networks (malware)<br>•Understand the threat of malware.<br>•Understand how to identify and protect against malware.<br>KEY QUESTION:<br>What effect do different malware attacks have on your computer?<br>SLR 1.4 – Lesson 3, Threats posed to networks (phishing) 1<br>•Understand phishing.<br>•Understand how to identify and protect against phishing.<br>KEY QUESTION:<br>What does a phishing attack set out to achieve?<br>SLR 1.4 – Lesson 4, Threats posed to networks (phishing) 2<br>•Understand phishing.<br>•Understand how to identify and protect against phishing.<br>KEY QUESTION:<br>What does a phishing attack set out to achieve?<br>SLR 1.4 – Lesson 5, Threats posed to networks (brute force attack)<br>•Understand brute force attacks.<br>•Understand how to identify and protect against brute force attacks.<br>KEY QUESTION:<br>How does a brute force attack work? | **Previous topics built on in this topic:**<br>Year 9 Networking Threats<br><br>Previous Programming Tasks | **Consolidation/Summative assessment:**<br><br>Mock 2: 12.01.2026<br><br>SLR 1.4 Test<br><br>SLR 1.5 Test<br><br>SLR 1.6 Test<br>SLR 2.2 Test<br><br>Sixaday Interleaving Interleaving Questions | Networking<br>Cyber Security | Malware<br>Virus<br>Worm<br>Trojan<br>Phishing<br>Social Engineering<br>Denial of Service<br>Firewall<br>Anti Malware<br>Penetration Testing<br>Network Forensics<br>Ethernet<br>Bluetooth<br>Encryption<br>Protocols<br>HTTP<br>FTP<br>POP<br>IMAP | Thinking all malware is a virus<br><br>Believing phishing is always easy to spot<br><br>Confusing brute force with hacking skill<br><br>Underestimating the human element in threats<br><br>Assuming antivirus protects from all attacks<br><br>Believing firewalls block hackers completely<br><br>Confusing passwords with encryption<br><br>Thinking the OS is just the desktop background<br><br>Assuming defragmentation speeds up SSDs<br><br>Confusing utilities with apps<br><br>Thinking ethical issues are only about legality<br><br>Confusing open source with public domain<br><br>Believing legal issues only apply to businesses |

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| | SLR 1.4 – Lesson 6, Threats posed to networks (denial of service)<br>•Understand denial-of-service attacks.<br>•Understand how to identify and protect against denial of service attacks.<br>KEY QUESTION:<br>What is the effect of a DDoS attack?<br>SLR 1.4 – Lesson 7, Threats posed to networks (data interception and theft)<br>•Understand data interception and theft as a security threat.<br>•Understand how to identify and protect against data interception.<br>KEY QUESTION:<br>What do we mean by "humans are a weak point"?<br>SLR 1.4 – Lesson 8, Threats posed to networks (SQL injection)<br>•Understand the concept of SQL injection.<br>•Understand how to protect against SQL injection.<br>KEY QUESTION:<br>How does a SQL injection hack work?<br>SLR 1.4 – Lesson 9, Identifying and preventing vulnerabilities<br>•Understand how people are a weak point in secure systems.<br>•Known how the following prevention methods help again the various forms of cyberattack:<br>oPenetration testing<br>oAnti-malware software<br>oFirewalls<br>oUser access levels<br>oPasswords<br>oEncryption | | | | | Confusing abstraction with simplifying everything<br><br>Assuming pseudocode must follow syntax<br><br>Believing all problems have one clear algorithm<br><br>Thinking assignment is comparison<br><br>Confusing selection with loops<br><br>Assuming all variables are global<br><br>Confusing validation with verification<br><br>Assuming a program that runs is error-free<br><br>Believing testing is only for errors, not improvement<br><br>Confusing logic gates with electrical circuits<br><br>Thinking truth tables are only theoretical<br><br>Mixing up binary 1s and 0s<br><br>Thinking compilers and interpreters do the same thing |

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| | oPhysical security<br>KEY QUESTION:<br>How can you protect yourself against hackers?<br>SLR 1.4 – Lesson 10, Identifying and preventing vulnerabilities<br>•Understand how people are a weak point in secure systems.<br>•Know how the following prevention methods help again the various forms of cyberattack:<br>oPenetration testing<br>oAnti-malware software<br>oFirewalls<br>oUser access levels<br>oPasswords<br>oEncryption<br>oPhysical security<br>KEY QUESTION:<br>How can you protect yourself against hackers?<br><br>SLR 1.5 – Lesson 1, The purpose and functionality of operating systems<br>•Know the purpose and functionality of operating systems.<br>•Know the different types of user interface and understand the features of each.<br>KEY QUESTION:<br>Why does your computer need an operating system?<br>SLR 1.5 – Lesson 2, Operating systems part 1<br>•Know what is meant by the term multi-tasking.<br>•Understand how the OS manages the memory.<br>•Understand the need for device drivers.<br>KEY QUESTION: | | | | Operating System<br>Multi-tasking<br>User Management<br>System Software] | Confusing high-level and low-level language<br><br>Believing assembly code and machine code are interchangeable<br><br>Thinking the OS is just the desktop background<br>Assuming defragmentation speeds up SSDs<br>Confusing utilities with apps |

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| | How does a computer manage having lots of programs open and running at the same time?<br>SLR 1.5 – Lesson 3, Operating systems part 2<br>•Understand what is meant by the term user management.<br>•Understand how the operating system manages files<br>KEY QUESTION:<br>What features does an operating system give users?<br>SLR 1.5 – Lesson 4, Utility system software<br>•Understand encryption utilities.<br>•Understand defragmentation utilities.<br>•Understand data compression utilities.<br>KEY QUESTION:<br>What is the purpose of utility software? | | | | Utility Software<br>Application Software<br>Defragmentation<br>Compression<br>Encryption<br>User Interface<br>Memory Management | |
| **Spring 1<br>Jan – Mar<br>8 weeks** | SLR 1.6 – Lesson 1, Ethical issues<br>•Know a range of things to consider beyond development when implementing new computer systems.<br>•Understand at least one ethical issue of computer technology.<br>KEY QUESTION:<br>What are the ethical issues of computing?<br>SLR 1.6 – Lesson 2, Privacy issues<br>•Understand at least one issue related to privacy and computer technologies.<br>KEY QUESTION:<br>What privacy issues does computing cause?<br>SLR 1.6 – Lesson 3, Legal issues<br>•Know the principles of the Acts of Parliament:<br>oData Protection Act 2018<br>oComputer Misuse Act 1990 | | | | Stakeholders<br>Ethical Issues<br>Environmental Issues<br>Cultural Issues<br>Privacy<br>Copyright<br>Patent<br>Data Protection<br>Computer Misuse<br>Open Source<br>Proprietary<br>Digital Divide | Thinking ethical issues are only about legality<br>Confusing open source with public domain<br>Believing legal issues only apply to businesses |

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| **Feb - Mar** | oCopyright Designs and Patents Act 1988<br>KEY QUESTION:<br>What does the legislation for computing prohibit?<br>SLR 1.6 – Lesson 4, Cultural issues<br>•Understand some of the key cultural issues of computer science:<br>oThe impact of technology on our daily lives.<br>oThe 'digital divide'.<br>oGlobalisation.<br>KEY QUESTION:<br>How does computing impact on people?<br>SLR 1.6 – Lesson 5, Environmental issues<br>•Understand the environmental impact of computers in terms of:<br>oManufacturing<br>oUse<br>oDisposal<br>KEY QUESTION:<br>What is the environmental impact of computing?<br>SLR 1.6 – Lesson 6, How digital technology impacts society<br>•Know how to identify key stakeholders.<br>•Know how to consider a scenario from the perspective of the stakeholders.<br>•Understand at least one scenario of the impact of computer science.<br>KEY QUESTION:<br>How can digital technology have an impact on society at a local, national and international level?<br>SLR 1.6 – Lesson 7, Open source vs proprietary software | | | | | |

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| | •Know the difference between open source and proprietary software.<br>•Understand the implications of using open source and proprietary software.<br>KEY QUESTION:<br>What recommendations would you give to someone considering software for their PC?<br><br>SLR 2.2 – Lesson 1, Basic programming constructs<br>•Know what is meant by the following key terms:<br>oVariables<br>oConstants<br>oInput<br>oOutput<br>oAssignment<br>•Know the 3 basic programming constructs.<br>KEY QUESTION:<br>What terms are associated with programming?<br>SLR 2.2 – Lesson 2, Data types, operators and string manipulation<br>•Know the different variable data types.<br>•Understand the need for casting.<br>•Know the arithmetic operators.<br>•Know the Boolean operators.<br>•Know the comparison operators.<br>•Understand how to use computer-related mathematic operators.<br>•Understand basic string manipulation commands.<br>KEY QUESTION:<br>Why are numbers sometimes stored as strings?<br>SLR 2.2 – Lesson 3, File handling | | | | Algorithm<br>Variable<br>Constant<br>Input<br>Output<br>Assignment<br>Constructs<br>Sequence<br>Selection<br>Iteration<br>Array<br>Function<br>Loop<br>Procedure<br>SQL<br>Variable<br>Parameter<br>Argument<br>One Dimensional Array<br>Two Dimensional Array | Confusing abstraction with simplifying everything<br>Assuming pseudocode must follow syntax<br>Believing all problems have one clear algorithm |

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| | •Understand how to use basic file handling operations:<br>oOpen files<br>oRead from files<br>oWrite to files<br>oClose files<br>KEY QUESTION:<br>What are the steps to using data files with programs?<br>SLR 2.2 – Lesson 4, Records and SQL<br>•Understand the term 'record'.<br>•Understand the SQL commands:<br>oSELECT<br>oFROM<br>oWHERE (including the Boolean operators)<br>oLIKE<br>•Know the purpose of nested SELECTs.<br>KEY QUESTION:<br>How is SQL used to search for data?<br>SLR 2.2 – Lesson 5, Arrays and sub-problems<br>•Understand how an array or list can be used to store data.<br>•Understand that arrays can be oneor two-dimensional.<br>•Understand that programs can be structured using procedures and functions.<br>•Understand that parameters can be passed and returned from functions.<br>•Understand that variables can be global or local.<br>KEY QUESTION:<br>What does a two-dimensional array or list mean?<br>Why are sub-programs used?<br>SLR 2.2 – Lesson 6, Random number generation | | | | | |

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| | •Understand how to use random number generation.<br><br>KEY QUESTION:<br>In what sort of problems might we need to generate a random number or sequence of random numbers?<br>SLR 2.2 – Lesson 7, Catch up lesson<br>•Catch up and complete any outstanding work from this unit.<br>KEY QUESTION:<br>What terms are associated with programming? | | | | | |
| **Spring 2 Mar--Apr (5 weeks)** | SLR 2.1 – Lesson 7, Linear search<br>•Understand the linear search algorithm.<br>•Understand it is not an efficient algorithm, but it is easier to program than alternatives and does not require the items to be in any order.<br>KEY QUESTION:<br>How does a linear search work?<br>SLR 2.1 – Lesson 8, Binary search<br>•Understand the binary search algorithm.<br>•Know the special condition of the list of items for the binary search to work.<br>•Understand which searching algorithm is quicker.<br>KEY QUESTION:<br>How does a binary search work?<br>SLR 2.1 – Lesson 9, Bubble sort<br>•Understand the bubble sort algorithm.<br>KEY QUESTION:<br>How does a bubble sort work?<br>SLR 2.1 – Lesson 10, Merge sort and insertion sort<br>•Understand the merge sort algorithm.<br>•Understand the insertion sort algorithm. | **Previous topics built on in this topic:**<br><br>1 & 2 markers to cover all previous topics. | Assessment week 3 – 23.03.2026<br><br>Mock 3<br><br>Summative assessment:<br>SLR 2.1 Test<br>SLR 2.2 Test<br>SLR 2.3Test<br>SLR 2.4Test<br><br>Sixaday Interleaving Interleaving Questions through quizzing | Programming | 2.1 Part 2<br>Binary Search<br>Flowchart<br>Linear Search,<br>Pseudocode<br>Sort<br>Bubble Sort<br>Insertion Sort<br>Merge Sort<br>Syntax Error<br>Logic Error | Thinking assignment is comparison<br><br>Confusing selection with loops<br><br>Assuming all variables are global<br><br>Believing bubble sort is always efficient. |

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| | KEY QUESTION:<br>How does a merge sort work?<br>How does an insertion sort work?<br>SLR 2.1 – Lesson 11, How to produce algorithms<br>•Know the flow diagram symbols.<br>•Know that flow diagrams are also called flowcharts.<br>•Know how to make a flow diagram.<br>•Understand how to construct a program from a flow diagram.<br>•Know what is meant by the term pseudocode.<br>•Understand how to write pseudocode.<br>•Understand the OCR reference language.<br>KEY QUESTION:<br>How can algorithms be described without ambiguity?<br>SLR 2.1 – Lesson 12, How to produce algorithms<br>•Know how to make a flow diagram.<br>•Understand how to write pseudocode.<br>•Understand how to write a program from a flow diagram and pseudocode.<br>•Understand the OCR reference language.<br>KEY QUESTION:<br>How can algorithms be described without ambiguity?<br>SLR 2.1 – Lesson 13, Interpret, correct or complete algorithms<br>•Understand how to interpret algorithms.<br>•Understand how to correct algorithms.<br>•Understand the OCR reference language.<br>KEY QUESTION:<br>How do you express algorithms using the exam board reference language?<br>SLR 2.1 – Lesson 14, How to produce algorithms<br>•Know how to make a flow diagram. | | | | | |

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| | •Understand how to write pseudocode.<br>•Understand how to write a program from a flow diagram and pseudocode.<br>•Understand the OCR reference language.<br>KEY QUESTION:<br>How can algorithms be described without ambiguity?<br>SLR 2.1 – Lesson 15, Identifying common errors and suggesting fixes<br>•Know what a syntax error is.<br>•Know what a logic error is.<br>•Know how identify simple syntax and logic errors in high-level code and the OCR reference language.<br>•Be able to suggest code fixes by spotting syntax and logic errors.<br>KEY QUESTION:<br>What are the different types of errors that can occur when programming?<br>SLR 2.1 – Lesson 16, Trace tables<br>•Know what a trace table is.<br>•Understand how and why trace tables can be useful for debugging.<br>•Know how to complete a trace table.<br>KEY QUESTION:<br>How and why do programmers use a trace table?<br><br>SLR 2.3 – Lesson 1, Input validation<br>•Know what is meant by the term "defensive design considerations" when writing programs.<br>•Understand why input validation is necessary.<br>•Know a range of validation techniques that can be used to write a robust program.<br>KEY QUESTION: | | | | Defensive Design<br>Validation<br>Verification<br>Robust Program<br>Authentication<br>Maintainability<br>Normal data | Confusing validation with verification<br>Assuming a program that runs is error-free<br>Believing testing is only for errors, not improvement |

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| | What issues should a programmer consider to ensure a program caters for all likely input values?<br>SLR 2.3 – Lesson 2, Defensive design consideration<br>•Know what is meant by the term "defensive design considerations" when writing programs.<br>•Know a range of potential problems that can occur when a program is running, especially if it requires communication to servers, peripherals, data in files and arithmetic.<br>•Understand some authentication techniques a programmer may choose to use to protect their program from misuse.<br>KEY QUESTION:<br>What issues should a programmer consider to ensure a program caters for all likely input values?<br>SLR 2.3 – Lesson 3, Maintainability and refining algorithms<br>•Know why creating easy to read code is important with large projects.<br>•Understand what programmers can do to make their code more readable.<br>•Understand how to refine algorithms to make them more robust.<br>KEY QUESTION:<br>What does code maintainability mean?<br>SLR 2.3 – Lesson 4, Types of testing and errors<br>•Know four reasons why a program should be tested.<br>•Know what iterative testing is.<br>•Know what final/terminal testing is.<br>•Know what a syntax error is.<br>•Know what a logic error is. | | | | Boundary data<br>Invalid data<br>Erroneous data | |

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| | KEY QUESTION:<br>What are the different types of errors that can occur in a program?<br>SLR 2.3 – Lesson 5, Suitable test data<br>•Understand that because a program works, it doesn't mean it works for all inputs.<br>•Understand that suitable test data for a program needs to include:<br>oNormal data<br>oBoundary data<br>oInvalid data<br>oErroneous data<br>KEY QUESTION:<br>What makes a good testing strategy?<br>SLR 2.3 – Lesson 6, Complete outstanding programs<br>•Understand how robust programs are made.<br>KEY QUESTION:<br>What makes a robust program?<br><br>SLR 2.4 – Lesson 1, Simple logic diagrams<br>•Know how to make simple logic diagrams from Boolean expressions using AND, OR, NOT.<br>KEY QUESTION:<br>What are the symbols used in logic diagrams?<br>SLR 2.4 – Lesson 2, Applying logic operators and truth tables to solve problems<br>•Understand how to complete truth tables from oneand two-level logic diagrams.<br>KEY QUESTION:<br>How do you complete a truth table?<br>SLR 2.4 – Lesson 3, Create, complete or edit logic diagrams and truth tables | | | | Logic Gate<br>AND<br>NOT<br>OR<br>Truth Table | Confusing logic gates with electrical circuits<br><br>Thinking truth tables are only theoretical |

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| | •Understand how to create, complete or edit logic diagrams and truth tables for given scenarios.<br>KEY QUESTION:<br>How do you create logic diagrams from truth tables?<br><br>SLR 2.5 – Lesson 1, Characteristics of languages<br>•Know the characteristics of high level and low-level programming languages.<br>•Understand the terms:<br>oSource code<br>oAssembly code<br>oMachine code<br><br>KEY QUESTION:<br>What are the differences between high and low-level languages?<br>SLR 2.5 – Lesson 2, Low level programming<br>•Understand how to write programs in a low-level language using assembly with Little Man Computer.<br>KEY QUESTION:<br>How do you write a program in assembly language?<br>SLR 2.5 – Lesson 3, Compilers and interpreters for translation<br>•Know what a translator does.<br>•Understand the differences between compilers and interpreters.<br>KEY QUESTION:<br>How does code a programmer writes become binary a computer can execute?<br>SLR 2.5 – Lesson 4, IDEs | | | | High Level Language<br>Low Level Language<br>Source Code<br>Assembly Code<br>Machine Code<br>Translator<br>Interpreter<br>Assembler<br>Integrated Development Environment<br>Run Time Environment | Low Level is easier to reach ie Human<br><br>Assembly Code and Machine Code are the same thing<br><br>Thinking compilers and interpreters do the same thing<br>Confusing high-level and low-level language<br>Believing assembly code and machine code are interchangeable |

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| | •Know a range of facilities provided by an integrated development environment (IDE) to assist the programmer in writing code.<br>KEY QUESTION:<br>Why do programmers use IDEs? | | | | | |
| **Summer 1 Apr – Jun (10 weeks)** | Revision | **Previous topics built on in this topic:**<br>All previous topics | **Consolidation/Summative assessment:**<br>Final Exams | | | |