Computer Science/IT

KS4 - LONG-TERM PLAN

Paper 1 and Paper 2 Theory Content

Name of unit	GLH	Unit Summary (Knowledge, Understanding and Skills)	Notes	Range of grades
Data Representation	11	**Units** • bit, nibble, byte, kilobyte, megabyte, gigabyte, terabyte, petabyte • how data needs to be converted into a binary format to be processed by a computer **Numbers** • how to convert positive denary whole numbers (0–255) into 8 bit binary numbers and vice versa • how to add two 8 bit binary integers and explain overflow errors which may occur • binary shifts • how to convert positive denary whole numbers (0–255) into 2 digit hexadecimal numbers and vice versa • how to convert from binary to hexadecimal equivalents and vice versa • check digits. **Characters** • the use of binary codes to represent characters • the term 'character-set' • the relationship between the number of bits per character in a character set and the number of characters which can be represented (for example ASCII, extended ASCII and Unicode). **Images** • how an image is represented as a series of pixels represented in binary	PAPER 2	

		- metadata included in the file - the effect of colour depth and resolution on the size of an image file. **Sound** - how sound can be sampled and stored in digital form - how sampling intervals and other factors affect the size of a sound file and the quality of its playback - sample size - bit rate - sampling frequency **Compression** - need for compression - types of compression: - lossy - lossless.		
System Architecture	3	T**he purpose of the CPU** **Von Neumann architecture:** - MAR (Memory Address Register) - MDR (Memory Data Register) - Program Counter - Accumulator **Common CPU components and their function** - ALU (Arithmetic Logic Unit) - CU (Control Unit) - Cache **The function of the CPU as fetch and execute instructions stored in memory** **how common characteristics of CPUs affect their** performance - clock speed - cache size - number of cores **Embedded systems**	PAPER 1	

		• purpose of embedded systems • examples of embedded systems.		
Memory	2	• the difference between RAM and ROM • the purpose of ROM in a computer system • the purpose of RAM in a computer system • the need for virtual memory • flash memory.	PAPER 1	
<td colspan="4" style="background:yellow">Mini programming assessment/Mini Project</td>
<td colspan="4" style="background:yellow">Summary Exam Questions</td>
Storage	2	**The need for secondary storage** **Data capacity and calculation of data capacity requirements** **Common types of storage** • Optical • Magnetic • solid state **Suitable storage devices and storage media for a given application, and the advantages and disadvantages of these, using characteristics**: • Capacity • Speed • Portability • Durability • Reliability • cost	PAPER 1	
Computational Logic	2	**Why data is represented in computer systems in binary form** **Simple logic diagrams using the operations AND, OR and NOT** **Truth tables** **Combining Boolean operators using AND, OR and NOT to two levels**	PAPER 2	

		Applying logical operators in appropriate truth tables to solve problems **Applying computing-related mathematics:** • + • − • / • * • Exponentiation (^) • MOD • DIV		
Wired and Wireless networks	4	**Types of networks** • LAN (Local Area Network) • WAN (Wide Area Network) **Factors that affect the performance of networks** **The different roles of computers in a client-server and a peer-to-peer network** **The hardware needed to connect stand-alone computers into a Local Area Network** • wireless access points • routers/switches • NIC (Network Interface Controller/Card) • transmission media **The internet as a worldwide collection of computer networks** • DNS (Domain Name Server) • Hosting • the cloud • the concept of virtual networks	PAPER 1	
Network Topologies and Layers	4	**Star and mesh network topologies** **Wifi** • frequency and channels • encryption **Ethernet**	PAPER 1	

		The uses of IP addressing, MAC addressing, and protocols including:		
		• TCP/IP (Transmission Control Protocol/Internet Protocol)		
		• HTTP (Hyper Text Transfer Protocol)		
		• HTTPS (Hyper Text Transfer Protocol Secure)		
		• FTP (File Transfer Protocol)		
		• POP (Post Office Protocol)		
		• IMAP (Internet Message Access Protocol)		
		• SMTP (Simple Mail Transfer Protocol)		
		The concept of layers		
		Packet switching		
Summary Exam Questions				
System Security	3	**Forms of attack** **Threats posed to networks**	PAPER 1	
		• malware		
		• phishing		
		• people as the 'weak point' in secure systems (social engineering)		
		• brute force attacks		
		• denial of service attacks		
		• data interception and theft		
		• the concept of SQL injection		
		• poor network policy		
		Identifying and preventing vulnerabilities		
		• penetration testing		
		• network forensics		
		• network policies		
		• anti-malware software		
		• firewalls		
		• user access levels		

		• passwords • Encryption		

System Software	2	**The purpose and functionality of systems software**
		Operating systems
		• user interface
		• memory management/multitasking
		• peripheral management and drivers
		• user management
		• file management
		Utility system software:
		• encryption software
		• defragmentation
		• data compression
		• **The role and methods of backup:**
		    o full
		    o incremental
			PAPER 1	

		Mock Exam **Programming Project**		
		Approximate Start of Y11		
Ethical, Legal, cultural and environmental issues	3	**How to investigate and discuss Computer Science technologies while considering**: • ethical issues • legal issues • cultural issues • environmental issues. • privacy issues. **How key stakeholders are affected by technologies** **Environmental impact of Computer Science**	PAPER 1 New Spec J277 incorporates GDPR on top of DPA	

		Cultural implications of Computer Science **Open source vs proprietary software** **Legislation relevant to Computer Science:** • The Data Protection Act 1998 (GDPR) • Computer Misuse Act 1990 • Copyright Designs and Patents Act 1988 • Creative Commons Licensing • Freedom of Information Act 2000		
Algorithms	11	**Computational thinking** • abstraction • decomposition • algorithmic thinking **Standard searching algorithms:** • binary search • linear search **Standard sorting algorithms:** • bubble sort • merge sort • insertion sort **How to produce algorithms using:** • pseudocode (OCR REFERENCE CODE) • using flow diagrams **Interpret, correct or complete algorithms**	PAPER 2 J277 Requires uses of Python or OCR reference code general pseudocode is not to be taught after 2020	
Mock Exam
Programming Techniques (Paper 2 Context)	4	**The use of variables, constants, operators, inputs, outputs and assignments** **The use of the three basic programming constructs used to control the flow of a program:** • Sequence • Selection • iteration (count and condition controlled loops)	PAPER 2 OCR Reference Code (J277) or Pseudocode (J276)	

		The use of basic string manipulation
		The use of basic file handling operations:
		    • open
		    • read
		    • write
		    • close
		The use of records to store data
		The use of SQL to search for data
		The use of arrays (or equivalent) when solving problems, including both one and two dimensional arrays
		How to use sub programs (functions and procedures) to produce structured code
		The use of data types
		    • integer
		    • real
		    • Boolean
		    • character and string
		    • casting
		The common arithmetic operators
		The common Boolean operators		

Robust Programs	2	**Defensive design considerations:**
		    • input sanitisation/validation
		    • planning for contingencies
		    • anticipating misuse
		    • authentication
		Maintainability:
		    • comments
		    • indentation
		The purpose of testing
		Types of testing:
		    • iterative
		    • final/terminal
			PAPER 2	

		How to identify syntax and logic errors **Selecting and using suitable test data**		

Translators and facilities of languages	2	**Characteristics and purpose of different levels of programming language, including low level languages**
		The purpose of translators
		The characteristics of an assembler, a compiler and an interpreter
		Common tools and facilities available in an integrated development environment (IDE):
		   • Editors
		   • error diagnostics
		   • run-time environment
		   • translators.		

Programming Project 20 hrs Planned time for J276 Opportunity to complete J277				
Mock Exam				

Computer Science/IT

Week	Lesson Summary	Knowledge and Skills	Resources	Assessment	Homework
<td colspan="6" align="center">**YEAR 10 BEGINS**</td>
1	**Lesson 1** • Units: bits, nibble, etc • How data needs to be converted into binary **Lesson 2** • How to convert positive denary whole numbers to binary and vice versa **Lesson 3** Python Workshop	Challenging Outcome • TBAT describe the terms bit, nibble, kilobyte, megabyte, gigabyte and terabyte Aspiring Outcome • TBAT explain why the data needs to be converted into binary formant to be processed by a computer Challenging Outcome • TBAT explain how to convert positive denary numbers (0-255) into 8-bit binary numbers and vice versa Aspiring Outcome • TBAT explain how to convert 8-bit positive binary numbers into denary numbers (0-255)	1:1 PC Python Access to Web VLE Lesson 1 - 2		
2	**Lesson 1** • How to add two 8bit binary integers and explain overflow errors	Challenging Outcome • TBAT explain add two 8 bit binary integers • Aspiring Outcome	1:1 PC Python Access to Web VLE Lesson 3 - 4		GCSE POD Assignment

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	Lesson 2 • Binary Shifts **Lesson 3** Python Workshop	• TBAT explain overflow errors which may occur Challenging Outcome • TBAT explain how a left shift is applied to an 8-bit positive binary number • TBAT explain how a right shift is applied to an 8-bit positive binary number Aspiring Outcome • Predict how an n-shift right or left affects an 8-bit positive binary number			
3	**Lesson 1** • How to convert positive denary whole numbers (0-255) into 2 digit hexadecimal numbers and vice versa **Lesson 2** • How to convert from binary to hexadecimal equivalents and vice versa **Lesson 3** Python Workshop	Challenging Outcome • TBAT explain how to convert between binary and hexadecimal equivalents of the same number Aspiring Outcome • TBAT explain the use of hexadecimal numbers to represent binary numbers Challenging Outcome • TBAT explain how to convert between binary and hexadecimal	1:1 PC Python Access to Web VLE Lesson 5 - 6		

		equivalents of the same number Aspiring Outcome • TBAT explain how to convert between hexadecimal and the binary equivalents of the same number			
4	**Lesson 1** • The use of binary codes to represent characters • Character-set • The relationship between the number of bits per character in a character set and the number of characters which can be represented (for example ASCII, extended ASCII and Unicode). **Lesson 2** • Images • How an image is represented as a series of pixels represented in binary • metadata included in the file • The effect of colour depth and resolution on the size of an image file.	Challenging Outcome • TBAT explain the use of binary codes to represent characters • TBAT explain the term character set Aspiring Outcome • TBAT explain with examples (ASCII and Unicode) the relationship between the number of bits per character in a character set and the number of characters which can be represented Challenging Outcome • TBAT explain the representation of an image as a series of pixels represented in binary • TBAT explain the need for metadata to be included	1:1 PC Python Access to Web VLE Lesson 7 - 8		

	Lesson 3 Python Workshop	in the file such as height, width and colour depth Aspiring Outcome • TBAT predict the effect of colour depth and resolution on the size of an image file			
5	**Lesson 1** • Sound • How sound can be sampled and stored in digital form • How sampling intervals and other factors affect the size of a sound file and the quality of its playback: Sample size, Bit rate, Sampling frequency **Lesson 2** • Compression • need for compression • types of compression: Lossy, Lossless. **Lesson 3** Python Workshop	Challenging Outcome • TBAT explain how sound can be sampled and stored in digital form • TBAT explain how sampling intervals and other considerations affect the size of a sound file Aspiring Outcome • TBAT explain how sampling intervals and other considerations affect the quality of its playback Challenging Outcome • TBAT explain why we use lossy/lossless compression • TBAT explain the difference between lossy and lossless compression Aspiring Outcome	1:1 PC Python Access to Web VLE Lesson 9 - 10		

		• TBAT predict the compression type needed for a given file			
6	Lesson 1 • Check Digits (PG Online P141) • Parity bit in ASCII • Check digits eg ISBN Lesson 2 • the purpose of the CPU • Von Neumann architecture: MAR (Memory Address Register), MDR (Memory Data Register), Program Counter, Accumulator • common CPU components and their function: ALU (Arithmetic Logic Unit), CU (Control Unit), Cache **Lesson 3** Python Workshop	Challenging Outcome • TBAT explain why we use check digits • TBAT predict the parity digit for a given ASCII code. Aspiring Outcome • TBAT explain how the check digit is calculated for ISBN numbers Challenging Outcome • TBAT explain the term system architecture • TBAT explain the purpose of the CPU Aspiring Outcome • TBAT explain different parts of the CPU	1:1 PC Python Access to Web VLE Lesson 11 -12		GCSE POD Assignment
7	**Lesson 1** • the purpose of the CPU • Von Neumann architecture: MAR (Memory Address Register), MDR (Memory Data Register), Program Counter, Accumulator	Challenging Outcome • TBAT explain the term system architecture • TBAT explain the purpose of the CPU Aspiring Outcome • TBAT explain different parts of the CPU	1:1 PC Python Access to Web VLE Lesson 12 - 13		

	• common CPU components and their function: ALU (Arithmetic Logic Unit), CU (Control Unit), Cache **Lesson 2** • the function of the CPU as fetch and execute instructions stored in memory (More Detail later in SOW) • how common characteristics of CPUs affect their performance: clock speed, cache size, number of cores **Lesson 3** Python Workshop	Challenging Outcome • TBAT explain the key parts of the fetch execute cycle • TBAT explain the factors that affect CPU performance Aspiring Outcome • TBAT explain what is happening during the fetch execute cycle			
8	Lesson 1 • embedded systems: • purpose of embedded systems • Examples of embedded systems. Lesson 2 • the difference between RAM and ROM • the purpose of ROM in a computer system • the purpose of RAM in a computer system	Challenging Outcome • TBAT explain the common Computer Systems • TBAT explain what an embedded system is Aspiring Outcome • TBAT explain why we use embedded systems rather than general purpose computers Challenging Outcome • TBAT explain the purpose of RAM	1:1 PC Python Access to Web VLE Lesson 14 - 15		GCSE POD Assignment

	Lesson 3 Python Workshop	• TBAT explain the purpose of ROM Aspiring Outcome • TBAT explain the difference between RAM and ROM			
9	**Lesson 1** • the need for virtual memory **Lesson 2** Summary Exam Question **Lesson 3** Mini Programming Assessment	Challenging Outcome • TBAT explain what virtual memory is used for. • TBAT explain what virtual memory is. Aspiring Outcome • TBAT predict the effect of using virtual memory	1:1 PC Python Access to Web GCSE Exam Builder OCR Sample Programming Projects VLE Lesson 16	• Mini Mock on topics so far • Mini Programming Assessment (Practical)	
10	**Lesson 1** • the need for secondary storage • data capacity and calculation of data capacity requirements • common types of storage: optical, magnetic, solid state **Lesson 2** • Mini Programming Assessment **Lesson 3** • Mini Programming Assessment	Challenging Outcome • TBAT explain how data capacities are calculated • TBAT predict the storage required for a file Aspiring Outcome • TBAT explain the technologies used for secondary storage	1:1 PC Python Access to Web VLE Lesson 17	• Mini Programming Assessment	

| 11 | **Lesson 1**
• Flash memory.
• Suitable storage devices and storage media for a given application, and the advantages and disadvantages of these, using characteristics: Capacity, speed, portability, durability, reliability, cost
Lesson 2
• why data is represented in computer systems in binary form
• simple logic diagrams using the operations AND, OR and NOT
• truth tables
• Combining Boolean operators using AND, OR and NOT to two levels.
• applying logical operators in appropriate truth tables to solve problems
Lesson 3
Python Workshop | Challenging Outcome
• TBAT explain how we choose a suitable secondary storage media
• TBAT explain the difference between reliability and durability
Aspiring Outcome
• TBAT explain the six characteristics of secondary storage

Challenging Outcome
• TBAT explain why data is represented in computer systems in binary form
• TBAT explain simple logic diagrams using the operations NOT, AND, OR
Aspiring Outcome
• TBAT predict a truth table from a given logic diagram | 1:1 PC
Python
Access to Web

VLE Lesson 18 - 19 | | GCSE POD
Assignment |
| 12 | **Lesson 1**
• applying computing-related mathematics: +, -, /, *, Exponentiation (^), MOD, DIV
Lesson 2 | • Develop links between exam questions Paper 1 & 2 and the practical Python implementation for the programming task | 1:1 PC
Python
Access to Web

VLE Lesson 20 | | |

	• Python Workshop computing-related mathematics **Lesson 3** Python Workshop				
13	**Lesson 1** • types of networks: • LAN (Local Area Network) • WAN (Wide Area Network) • factors that affect the performance of networks **Lesson 2** • The different roles of computers in a client-server and a peer-to-peer network **Lesson 3** Python Workshop	Challenging Outcome • TBAT explain why we network computers together • TBAT explain and define what is meant by a LAN Aspire: • TBAT explain and define what is meant by a WAN Challenging Outcome • TBAT explain what is meant by Peer-Peer • TBAT explain what is meant by Client Server Aspire: • TBAT explain differences and advantages of Client Server and Peer-Peer	1:1 PC Python Access to Web VLE Lesson 21 - 22		
14	**Lesson 1** • the hardware needed to connect stand-alone computers into a Local Area Network: wireless access points, routers/switches, NIC (Network Interface	Challenging Outcome • TBAT explain the role of components required to create a LAN • TBAT explain what meant by the performance of a network and why this is important	1:1 PC Python Access to Web VLE Lesson 23 - 24		GCSE POD Assignment

	Controller/Card), transmission media **Lesson 2** • the internet as a worldwide collection of computer networks: DNS (Domain Name Server), hosting, the cloud, the concept of virtual networks **Lesson 3** Python Workshop	Aspire: • TBAT explain the factors that can affect the performance of a network Challenging Outcome • TBAT explain that the internet is a worldwide collection of computers • TBAT explain the role of DNS as part of the internet and web hosting Aspire: • TBAT explain what is meant by the cloud, a virtual network and why virtual networks are used			
15	**Lesson 1** • star and mesh network topologies • Wi-Fi: frequency and channels, encryption • Ethernet **Lesson 2** • the uses of IP addressing, MAC addressing • Protocols including: TCP/IP (Transmission Control Protocol/Internet Protocol), HTTP (Hyper Text Transfer Protocol), HTTPS (Hyper Text Transfer Protocol	Challenge: • TBAT identify and describe a Star and Mesh Topology • TBAT explain the Advantages and Disadvantages of Wi-Fi and Ethernet Aspire: • TBAT explain what encryption is and why it is required Challenge:	1:1 PC Python Access to Web VLE Lesson 25 - 26		

	Secure), FTP (File Transfer Protocol), POP (Post Office Protocol), IMAP (Internet Message Access Protocol), SMTP (Simple Mail Transfer Protocol) **Lesson 3** Python Workshop	• TBAT identify what the main IP Addressing, MAC Addressing and protocols are • TBAT explain a range of protocol acronyms Aspire: • TBAT explain what some of the protocols do			
16	**Lesson 1** • the concept of layers **Lesson 2** • Packet switching **Lesson 3** Python Workshop	Challenge: • TBAT explain what layers are and their role • TBAT explain the role of each layer Aspire: • TBAT explain why we use the concept of layers Challenge: • TBAT explain what a packet is • TBAT explain the role of a packet header Aspire: • TBAT explain why we use packet switching	1:1 PC Python Access to Web VLE Lesson 27 - 28		GCSE POD Assignment
17	<mark>Mini Mock GCSE EXAM BUILDER</mark>				
18	**Lesson 1** • Forms of attack • threats posed to networks: malware, phishing, people as the 'weak point' in	Challenge: • TBAT explain what malware is • TBAT explain the term social engineering	1:1 PC Python Access to Web Kali Linux		

	secure systems (social engineering), brute force attacks, denial of service attacks, data interception and theft, the concept of SQL injection, poor network policy **Lesson 2** • Identifying and preventing vulnerabilities: penetration testing, network forensics, network policies, anti-malware software, firewalls, user access levels, passwords, encryption **Lesson 3** • Practical "Hacking" Workshop Kali Linux/Wifi brute force attack demonstration	Aspire: • TBAT explain the terms DoS, Brute Force and SQL injection Challenging Outcome • TBAT explain penetration testing • TBAT explain network forensics Aspiring Outcome • TBAT explain suitable protection methods for threats	Off network devices and WIFI routers for demo VLE Lesson 29 - 31		
19	**Lesson 1** • the purpose and functionality of systems software operating systems: user interface, memory management/ multitasking, peripheral management and drivers, user management, file management **Lesson 2**	Challenging Outcome • TBAT explain System Software • TBAT explain key tasks the operating system does Aspiring Outcome • TBAT explain and give examples of 5 keys tasks Challenging Outcome	1:1 PC Python Access to Web 1:1 PC Python Access to Web VLE Lesson 32 - 33		

	• the purpose and functionality of systems software utility system software: encryption software, defragmentation, data compression, the role and methods of backup: full/incremental **Lesson 3** Python Workshop	• TBAT explain System Software • TBAT explain key tasks the utility software does Aspiring Outcome • TBAT explain and give examples of keys utility software			
20	Python Extended project Assessment (J276 – Required Programming Project J277 2020+ 1st Assessment 2022 Planned opportunity to undertake a programming task(s), either to a specification or to solve a problem (or problems), during their course of study				
21					
22					
23					
24					
25					
26					
27	**Mock Paper 1**				
28	**Mock Paper 2**				
29	Opportunity for Paper Review QLA and topic refreshers Opportunity to extend/move programming project if required				
30					
31					
32					
33					
34					
35					
36	**Approximate end of Year 10**				
	YEAR 11 BEGINS				
1	**Lesson 1** • Consider ethical issues, cultural issues, and privacy	Challenging Outcome • TBAT explain the ethical and cultural issues related	1:1 PC Python Access to Web		Example ethics essay (Robotic Healthcare)

			VLE Lesson 34 - 35		
	issues related to computer science **Lesson 2** - how key stakeholders are affected by technologies - environmental impact of Computer Science - Privacy Issues - Security Issues - open source vs proprietary software **Lesson 3** Python/OCR Reference Language practice tasks	to computer science technologies Aspiring Outcome - TBAT discuss privacy issues related to the collection of electronic data by government and commercial organisations Challenging Outcome - TBAT explain how key stakeholders are affected by technologies - TBAT explain the security issues and privacy issues Aspiring Outcome - TBAT explain the environment factors of computer science - TBAT explain the difference between open source and proprietary software			
2	**Lesson 1** legislation relevant to Computer Science: The Data Protection Act 1998, Computer Misuse Act 1990, Copyright Designs and Patents Act 1988, Creative Commons Licensing,	Challenging Outcome - TBAT describe The Data Protection Act, The Computer Misuse Act and the Design and Patents Act - TBAT explain the Creative Common Licence Aspiring Outcome	1:1 PC Python Access to Web VLE Lesson 36 - 37		GCSEPOD Assignment

	Freedom of Information Act 2000. **Lesson 2** • computational thinking: abstraction **Lesson 3** Python/OCR Reference Language practice tasks	• TBAT explain The Freedom of Information Act Challenging Outcome • TBAT explain the process of abstraction • TBAT demonstrate using an example how abstraction is used in simulations Aspiring Outcome • TBAT create a summary of this method of computational thinking			
3	**Lesson 1** • computational thinking: decomposition **Lesson 2** • computational thinking: algorithmic thinking **Lesson 3** Python/OCR Reference Language practice Tasks	Challenging Outcome • TBAT explain the process of decomposition • TBAT demonstrate using an example how decomposition is used in programs Aspiring Outcome • TBAT understand the term and processes in computational thinking. Challenging Outcome • TBAT explain the process of algorithmic thinking • TBAT demonstrate using an example how	1:1 PC Python Access to Web VLE Lesson 38 - 39		

		algorithmic thinking is used in programs Aspiring Outcome • TBAT create a summary of this method of computational thinking.			
4	**Lesson 1** • standard searching algorithms: • linear search **Lesson 2** • standard searching algorithms: • binary search **Lesson 3** Python/OCR Reference Language practice Tasks	Challenging Outcome • TBAT explain the process of A LINEAR SEARCH • TBAT demonstrate using an example how to carry out a LINEAR SEARCH Aspiring Outcome • TBAT create a summary of a LINEAR SEARCH algorithm Challenging Outcome • TBAT explain the process of A BINARY SEARCH • TBAT demonstrate using an example how to carry out a BINARY SEARCH Aspiring Outcome • TBAT create a summary of a BINARY SEARCH algorithm	1:1 PC Python Access to Web VLE Lesson 40 - 41		
5	**Lesson 1** • standard sorting algorithms: • bubble sort Lesson 2	Challenging Outcome • TBAT explain the process of a BUBBLE SORT	1:1 PC Python Access to Web		

	• standard sorting algorithms: insertion sort **Lesson 3** Python/OCR Reference Language practice Tasks	• TBAT demonstrate using an example how to carry out a BUBBLE SORT Aspiring Outcome • TBAT create a summary of a BUBBLE SORT algorithm Challenging Outcome • TBAT explain the process of a INSERTION SORT • TBAT demonstrate using an example how to carry out a INSERTION SORT Aspiring Outcome • TBAT create a summary of a INSERTION SORT algorithm	VLE Lesson 42 - 43		
6	**Lesson 1** • standard sorting algorithms: merge sort **Lesson 2** • How to produce algorithms using: • using flow diagrams • Interpret, correct or complete. **Lesson 3** Python/OCR Reference Language practice Tasks	Challenging Outcome • TBAT explain the process of a MERGE SORT • TBAT demonstrate using an example how to carry out a MERGE SORT Aspiring Outcome • TBAT create a summary of a MERGE SORT algorithm Aspiring Outcome • TBAT Create an algorithm for a non-simple problem	1:1 PC Python Access to Web VLE Lesson 44 - 45		GCSEPOD Assignment

		Challenging Outcome • TBAT Create an algorithm for a simple task. • TBAT Follow a simple algorithm and understand the process.			
7	**Lesson 1** • Interpret, correct or complete. **Lesson 2** • How to produce algorithms using: • using pseudocode • Interpret, correct or complete **Lesson 3** Python/OCR Reference Language practice Tasks	Aspire: • TBAT Create a trace table for a non-simple algorithm Challenging • TBAT Create a trace table for a simple algorithm. • TBAT Demonstrate what a trace table should look like. Aspire: • TBAT Create a pseudocode algorithm for a non-simple algorithm Challenging • TBAT Create a pseudocode algorithm for a simple algorithm. • TBAT Demonstrate what a pseudocode algorithm should look like.	1:1 PC Python Access to Web VLE Lesson 46 - 47		Practice Trace Table exercises
8	<td colspan="5" align="center">Mock Exams and Reviews</td>
9	
10	**Lesson 1** • the use of variables, constants, operators,	This is a theoretical summary of the techniques students have learned practically.	1:1 PC Python Access to Web		

	inputs, outputs and assignments • the use of data types: integer, real, Boolean, character and string, casting • the use of the three basic programming constructs used to control the flow of a program: sequence, selection, iteration (count and condition controlled loops) • the common arithmetic operators • the common Boolean operators **Lesson 2** • the use of arrays (or equivalent) when solving problems, including both one and two dimensional arrays **Lesson 3** Python/OCR Reference Language practice Tasks	Aspire: • TBAT explain key programming constructs Challenge • TBAT describe the function of arithmetic and Boolean operators • TBAT describe variables, constants and assignment Aspire: • TBAT explain key data structures – 2D Arrays Challenge • TBAT describe the function of Arrays • TBAT describe differences between Arrays and Lists	VLE Lesson 48 – 49		
11	**Lesson 1** • the use of basic string manipulation • the use of basic file handling operations: open, read, write, close **Lesson 2**	Aspire: • TBAT explain the use of key file operators Challenge • TBAT describe the function of key file operators	1:1 PC Python Access to Web VLE Lesson 50 - 51		

	• how to use sub programs (functions and procedures) to produce structured code **Lesson 3** Python/OCR Reference Language practice Tasks	• To be able to describe the difference between functions and procedures			
12	**Lesson 1** • the use of records to store data • the use of SQL to search for data **Lesson 2** • defensive design considerations: input sanitisation/validation, planning for contingencies, anticipating misuse, authentication, • maintainability: comments, indentation **Lesson 3** Python/OCR Reference Language practice Tasks	Aspire: • TBAT build up SQL statements to answer questions requiring AND/OR/NOT operators Challenge • TBAT read, understand and write variable SQL statements Aspire: • TBAT Demonstrate an understanding of defensive design considerations Challenge • TBAT Demonstrate and describe syntax and logic errors • TBAT Demonstrate and describe test data and test tables	1:1 PC Python Access to Web VLE Lesson 52 - 53		
13	**Lesson 1** • the purpose of testing • types of testing: iterative, final/terminal	Aspire: • TBAT Demonstrate an understanding of	1:1 PC Python Access to Web		GCSE POD Assignment

	• how to identify syntax and logic errors • Selecting and using suitable test data. **Lesson 2** • characteristics and purpose of different levels of programming language, including low-level languages • the purpose of translators • the characteristics of an assembler, a compiler and an interpreter **Lesson 3** Python/OCR Reference Language practice Tasks	defensive design considerations Challenge • TBAT Demonstrate and describe syntax and logic errors • TBAT Demonstrate and describe test data and test tables Aspire: • TBAT Demonstrate key features of IDEs Developing • TBAT Demonstrate the use of an Interpreter. • TBAT Demonstrate the use of a Compiler.	VLE Lesson 54 - 55		
14	Lesson 1 • Common tools and facilities available in an integrated development environment (IDE): editors, error diagnostics, run-time environment, translators. Lesson 2 • Revision Opportunity Lesson 3 • Revision Opportunity	Aspire: • TBAT Demonstrate key features of IDEs Challenge • TBAT Demonstrate the use of an Interpreter. • TBAT Demonstrate the use of a Compiler.	1:1 PC Python Access to Web VLE Lesson 56		
15					
16	Mock Exams and Reviews				
17	Revision				

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18	Revision				GCSEPOD Sample Questions
19	Revision				GCSEPOD Sample Questions
20	Revision				GCSEPOD Sample Questions
21	Revision				GCSEPOD Sample Questions
22	Revision				GCSEPOD Sample Questions
23	Revision				GCSEPOD Sample Questions
24	Revision				GCSEPOD Sample Questions
25	Revision				GCSEPOD Sample Questions
26	Revision				GCSEPOD Sample Questions
GCSE Paper 1 & Paper 2 Early May					