

LONG-TERM OVERVIEW

YEAR 12			
Term	Topics	Assessment	Notes
1	<ul style="list-style-type: none"> Introduction to the course SLR 1 Structure and function of the processor (7 lessons) SLR 2 Types of processor (3 lessons) Plus 26 dedicated programming lessons 	<ul style="list-style-type: none"> Completed SLRs 1-2 form the basis for assessment. SLR 1-2 exam questions 	<ul style="list-style-type: none"> The Structured Learning Records included for capturing students' evidence of learning and assessment include both AS and Full A Level spec points. For delivery of the AS course only, you can ignore any specification points written in gold text. The following Structured Learning Records contain <u>full</u> A Level content ONLY and do not need to be delivered as part of an AS only course. <ul style="list-style-type: none"> SLR07 Types of programming language SLR09 Compression, encryption and hashing SLR22 Thinking concurrently SLR24 Computational methods SLR26 Algorithms
2	<ul style="list-style-type: none"> SLR 3 Input, output and storage (5 lessons) SLR 13 Data types (8 lessons) SLR 15 Boolean algebra (5 lessons) SLR 4 Operating systems (8 lessons) Plus 16 dedicated programming lessons 	<ul style="list-style-type: none"> Completed SLRs 3, 4, 13 and 15 form the basis for assessment. SLR 3, 4, 13 and 15 exam questions 	
3	<ul style="list-style-type: none"> SLR 16 Computer-related legislation (3 lessons) SLR 5 Application generation (4 lessons) SLR 6 Software development (7 lessons) SLR 18 Thinking abstractly (3 lessons) SLR 10 Databases (4 lessons) Plus 15 dedicated programming lessons 	<ul style="list-style-type: none"> Completed SLRs 5, 6, 10, 16 and 18 form the basis for assessment. SLR 5, 6, 10, 16 and 18 exam questions 	
4	<ul style="list-style-type: none"> SLR 11 Networks (6 lessons) SLR 12 Data types (8 lessons) SLR 17 Ethical, moral and cultural issues (4 lessons) SLR 14 Data structures (4 lessons) SLR 8 Compression, encryption and hashing (7 lessons) 	<ul style="list-style-type: none"> Completed SLRs 11, 12, 14 and 17 form the basis for assessment. SLR 11, 12, 14 and 17 exam questions 	
5	<ul style="list-style-type: none"> SLR 23 Programming techniques (4 lessons) SLR 19 Thinking ahead (3 lessons) SLR 20 Thinking procedurally (3 lessons) SLR 21 Thinking logically (3 lessons) SLR 25 Algorithms (9 lessons) Plus 8 dedicated revision lessons 	<ul style="list-style-type: none"> Completed SLRs 19, 20, 21, 23 and 25 form the basis for assessment. SLR 19, 20, 21, 23 and 25 exam questions 	

The dedicated programming lessons are for students to engage in self-directed programming. We have hundreds of activities, worksheets and programming challenges for them to complete, available through your premium resources account.

For a detailed breakdown of which lessons to deliver week by week, see our Excel delivery calendar *OCR AS-Level Only - 1-week model (delivery calendar).xlsx*, which this SoL is based on.

SHORT-TERM SCHEME OF LEARNING

1. This lesson-by-lesson breakdown is based on a one-week calendar for the AS-Level course only. You will need to adapt it slightly to fit your school's delivery model.
2. The delivery method is flipped classroom, and homework is presented *before* the next lesson with a link to our YouTube videos hosted on student.craigdave.org.
3. A description of how a typical Craig 'n' Dave flipped classroom lessons can be structured is available here: craigdave.org/our-pedagogy/alevel-lesson/.
4. Along with the dedicated programming lessons in Year 12, students should reinforce their programming skills through regular practice in their own time. Opportunities for independent programming during lesson time are shown in **green**.
5. Dedicated lesson time for end-of-topic tests and student self-assessment are shown in **blue**.
6. Each topic in this SoL is presented as part of a Structured Learning Record, each structured learning record can be download from your premium account as a single zip file. When extracted they contain the following folders:



Activities

Contains all the activities for you to share with your students.

We often provide **more** activities than your students could reasonably complete in the time provided.

We constantly improve and add to our bank of activities for each SLR, so please check each year for the latest updates!

Pick and choose the most appropriate activities for your students as required.



Answers

Contains all the activities **plus** model answers.

For you to use as you see fit.



Assessment

Contains the Structure Learning Records for your students to fill out as they carry out the activities above.

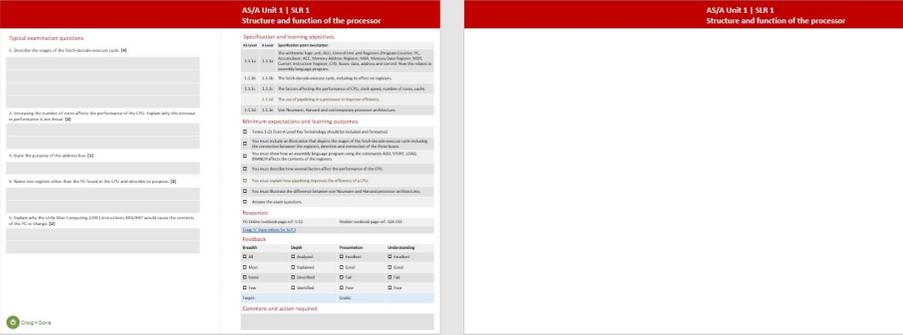
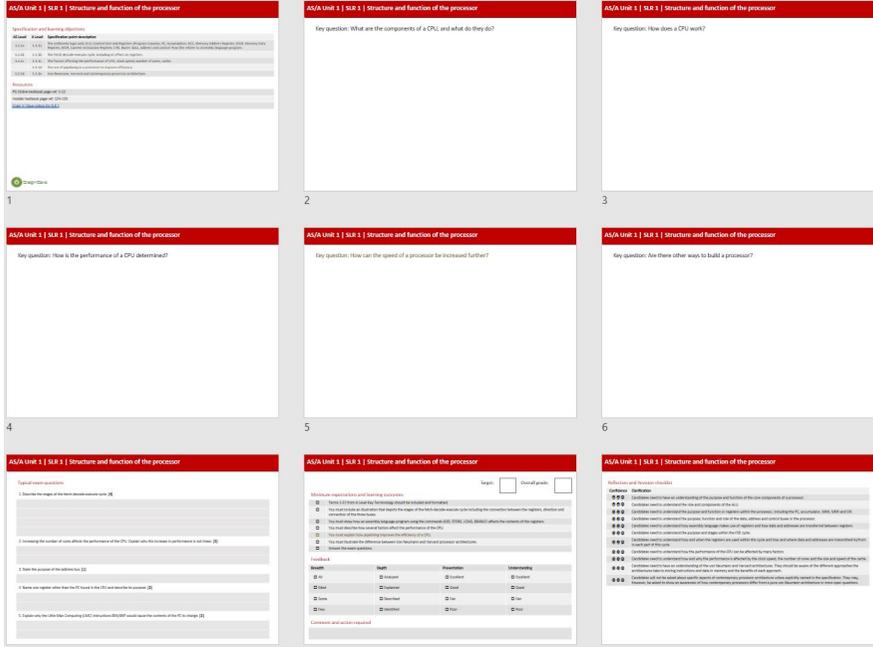
These provide your method of assessment. There is a video in this folder explaining how to get the most out of our SLRs.

Contains answers to the exam questions set in the SLRs.

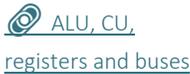


AS Level OCR Computer Science – Scheme of Learning (One-year AS Level method)

7. Out structured learning records come in two formats. We would not expect a student to complete both formats, choose the one which is most appropriate for each of your students.

A3 Unscaffolded format	A4 Scaffolded format
	
<ul style="list-style-type: none"> • An unscaffolded format to allow students more freedom in how to demonstrate their knowledge and understanding in any way they see fit. • Provides minimal support on the cover page in terms of minimum expectations. • Provides an area for exam questions, assessment and feedback. 	<ul style="list-style-type: none"> • A scaffolded format providing students with prompts in the form of questions which they need to answer in order to demonstrate their knowledge and understanding. • The question slides are referenced in the “Key question” column in the SoL. • Provides an area for exam questions, assessment and feedback. • Provides a reflection and revision checklist.
<p> Assessment with Craig'n'Dave – (AS/A Level)</p>	

AS Level OCR Computer Science – Scheme of Learning (One-year AS Level method)

YEAR 12 - TERM 1							
Topic focus	Spec ref	Specification learning outcomes	Key question	Activities	HW for next lesson	Key terms	
0	Introduction to the course	N/A	<ul style="list-style-type: none"> Understand the course structure and appreciate how you will be taught and assessed in this subject. Understand the importance of the flipped classroom approach. 	What is computer science?	None		
1 to 12	Independent programming	N/A	<p>Gain experience in practical programming</p> <p>Use our <i>T.I.M.E</i> workbooks, <i>Programming challenges</i> and <i>Defold games tutorials</i>.</p>	Various	 ALU, CU, registers and buses		
13	SLR1 - Structure and function of the processor	1.1.1a	<ul style="list-style-type: none"> The arithmetic logic unit; ALU, Control Unit and Registers (Program Counter; PC, Accumulator; ACC, Memory Address Register; MAR, Memory Data Register; MDR, Current Instruction Register; CIR). Busses: data, address and control: How this relates to assembly language program. 	What are the components of a CPU, and what do they do? (SLR1 slide 2)	SLR1 Activities folder SLR1 Answers folder (Files starting 01)		ALU, Control unit, Register, PC, ACC, MAR, MDR, CIR, Busses, Data bus, Address bus, Control bus, Fetch-decode-execute, CPU, Clock speed, Cores, Cache, Von Neumann architecture, Harvard architecture, Contemporary architecture
14	SLR1 - Structure and function of the processor	1.1.1a	<ul style="list-style-type: none"> The arithmetic logic unit; ALU, Control Unit and Registers (Program Counter; PC, Accumulator; ACC, Memory Address Register; MAR, Memory Data Register; MDR, Current Instruction Register; CIR). Busses: data, address and control: How this relates to assembly language program. 	What are the components of a CPU, and what do they do? (SLR1 slide 2)	SLR1 Activities folder SLR1 Answers folder (Files starting 01)		
15	SLR1 - Structure and function of the processor	1.1.1a	<ul style="list-style-type: none"> The arithmetic logic unit; ALU, Control Unit and Registers (Program Counter; PC, Accumulator; ACC, Memory Address Register; MAR, Memory Data Register; MDR, Current Instruction Register; CIR). Busses: data, address and control: How this relates to assembly language program. 	What are the components of a CPU, and what do they do? (SLR1 slide 2)	SLR1 Activities folder SLR1 Answers folder (Files starting 01)	 Fetch decode execute cycle	
16	SLR1 - Structure and function of the processor	1.1.1b	<ul style="list-style-type: none"> The fetch-decode-execute cycle, including its effect on registers. 	How does a CPU work? (SLR1 slide 3)	SLR1 Activities folder SLR1 Answers folder (Files starting 02)	 Performance of the CPU	

AS Level OCR Computer Science – Scheme of Learning (One-year AS Level method)

Topic focus		Spec ref	Specification learning outcomes	Key question	Activities	HW for next lesson	Key terms
17	SLR1 - Structure and function of the processor	1.1.1c	<ul style="list-style-type: none"> The factors affecting the performance of CPU, clock speed, number of cores, cache. 	How is the performance of a CPU determined? (SLR1 slide 4)	SLR1 Activities folder SLR1 Answers folder (Files starting 03)	 Von Neumann and Harvard	
18	SLR1 - Structure and function of the processor	1.1.1d	<ul style="list-style-type: none"> Von Neumann, Harvard and contemporary processor architecture. 	Are there other ways to build a processor? (SLR1 slide 6)	SLR1 Activities folder SLR1 Answers folder (Files starting 04)		
19	SLR1 – End-of-topic test	End-of-topic test Student self-assessment RAG rating opportunity			Test – SLR1 (slide 7) Self-assess (slide 9)		
20 to 24	Independent programming	N/A	Gain experience in practical programming Use our <i>T.I.M.E</i> workbooks, <i>Programming challenges</i> and <i>Defold games tutorials</i> .		Various	 CISC vs RISC	
25	SLR2 - Types of processor	1.1.2a	<ul style="list-style-type: none"> The differences between and uses of CISC and RISC processors 	What are the differences between the RISC and CISC architectures? (SLR2 slide 2)	SLR2 Activities folder SLR2 Answers folder (Files starting 01)	 Multicore and parallel systems	CISC, RISC, Multicore system, Parallel processor system
26	SLR2 - Types of processor	1.1.2b	<ul style="list-style-type: none"> Multicore and parallel systems 	How does having multiple cores affect the speed of processing? (SLR2 slide 3)	SLR2 Activities folder SLR2 Answers folder (Files starting 02)		
27	SLR2 – End-of-topic test	End-of-topic test Student self-assessment RAG rating opportunity			Test – SLR2 (slide 5) Self-assess (slide 7)		
28 to 36	Independent programming	N/A	Gain experience in practical programming Use our <i>T.I.M.E</i> workbooks, <i>Programming challenges</i> and <i>Defold games tutorials</i> .		Various	 Input, Output and Storage devices	

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YEAR 12 - TERM 2							
Topic focus	Spec ref	Specification learning outcomes	Key question	Activities	HW for next lesson	Key terms	
37	SLR3 - Input, output and storage	1.1.3a	<ul style="list-style-type: none"> How different input, output and storage devices can be applied as a solution to different problems 	How are input, output and storage devices used in typical applications of Computer Science? (SLR3 slide 2)	SLR3 Activities folder SLR3 Answers folder (Files starting 01)	Magnetic, Flash and Optical storage	Input device, Output device, Storage device, Magnetic storage, Flash storage, Optical storage, RAM, ROM, Virtual storage
38	SLR3 - Input, output and storage	1.1.3b	<ul style="list-style-type: none"> The uses of magnetic, flash and optical storage devices 	How do different storage devices compare in terms of cost, capacity and speed? (SLR3 slide 3)	SLR3 Activities folder SLR3 Answers folder (Files starting 02)		
39	SLR3 - Input, output and storage	1.1.3b	<ul style="list-style-type: none"> The uses of magnetic, flash and optical storage devices 	How do different storage devices compare in terms of cost, capacity and speed? (SLR3 slide 3)	SLR3 Activities folder SLR3 Answers folder (Files starting 02)	RAM and ROM Virtual storage	
40	SLR3 - Input, output and storage	1.1.3c&d	<ul style="list-style-type: none"> RAM and ROM Virtual storage 	What are the characteristics of ROM and RAM? (SLR3 slide 4) What are the benefits and drawbacks of virtual storage? (SLR3 slide 5)	SLR3 Activities folder SLR3 Answers folder (Files starting 03)		
41	SLR3 – End-of-topic test	End-of-topic test Student self-assessment RAG rating opportunity			Test – SLR3 (slide 6) Self-assess (slide 8)	Primitive Data Types	
42	SLR13 – Data types	1.4.1a	<ul style="list-style-type: none"> Primitive data types, integer, real/floating-point, character, string and Boolean 	What is meant by the term, 'data type'? (SLR13 slide 2)	SLR13 Activities folder SLR13 Answers folder (Files starting 01)	Binary Positive Integers Sign and Magnitude Two's Complement	Primitive data types, Integer, Real, Floating point, Character, String, Boolean, Binary, Sign and magnitude, Two's complement, Hexadecimal, Denary, Character sets, ASCII, UNICODE, Array
43	SLR13 – Data types	1.4.1b&c	<ul style="list-style-type: none"> Represent positive integers in binary Use of sign and magnitude and two's complement to represent negative numbers in binary 	How are numbers stored in memory? (SLR13 slide 3)	SLR13 Activities folder SLR13 Answers folder (Files starting 02 & 03)	Binary Addition and Subtraction	
44	SLR13 – Data types	1.4.1d	<ul style="list-style-type: none"> Addition and subtraction of binary integers 	How does an arithmetic logic unit (ALU) perform arithmetic? (SLR13 slide 4)	SLR13 Activities folder SLR13 Answers folder (Files starting 04)	Hexadecimal Representation	

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Topic focus	Spec ref	Specification learning outcomes	Key question	Activities	HW for next lesson	Key terms
					Converting between Binary, Hex and Denary	
45	SLR13 – Data types	1.4.1e&f	<ul style="list-style-type: none"> Represent positive integers in hexadecimal Convert positive integers between binary hexadecimal and denary 	Provide an example of a situation where working with large binary numbers is a problem. What is the solution? (SLR13 slide 5)	SLR13 Activities folder SLR13 Answers folder (Files starting 05 & 06)	Floating-point binary – Part 1 Floating-point binary – part 2 (normalisation)
46	SLR13 – Data types	1.4.1g	<ul style="list-style-type: none"> Positive and negative real numbers using normalised floating-point representation 	How does a computer store fractions (real numbers)? (SLR13 slide 6)	SLR13 Activities folder SLR13 Answers folder (Files starting 07)	Floating point binary – Part 3 (further examples)
47	SLR13 – Data types	1.4.1g	<ul style="list-style-type: none"> Positive and negative real numbers using normalised floating-point representation 	How does a computer store a larger range of numbers in a fixed number of bits in memory? (SLR13 slide 7)	SLR13 Activities folder SLR13 Answers folder (Files starting 07)	Character Sets
48	SLR13 – Data types	1.4.1h	<ul style="list-style-type: none"> How character sets (ASCII and UNICODE) are used to represent text 	How does a computer store text in memory? (SLR13 slide 9)	SLR13 Activities folder SLR13 Answers folder (Files starting 08)	
49	SLR13 – End-of-topic test	End-of-topic test Student self-assessment RAG rating opportunity		Test – SLR13 (slide 11) Self-assess (slide 13-14)		
50 to 54	Independent programming	N/A	Gain experience in practical programming Use our <i>T.I.M.E</i> workbooks, <i>Programming challenges</i> and <i>Defold games tutorials</i> .	Various	Define problems using Boolean logic	
55	SLR15 – Boolean algebra	1.4.3a	<ul style="list-style-type: none"> Define problems using Boolean logic 	What are the Boolean operators and their associated logic gate symbols? (SLR15 slide 2)	SLR15 Activities folder SLR15 Answers folder (Files starting 01)	Boolean logic, Karnaugh maps, Logic gate diagram, Truth table, AND, OR, NOT, XOR
56	SLR15 – Boolean algebra	1.4.3a	<ul style="list-style-type: none"> Define problems using Boolean logic 	What are the Boolean operators and their associated logic gate symbols? (SLR15 slide 2)	SLR15 Activities folder SLR15 Answers folder (Files starting 01)	

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Topic focus	Spec ref	Specification learning outcomes	Key question	Activities	HW for next lesson	Key terms	
					Karnaugh maps part 3 Karnaugh maps part 4		
57	SLR15 – Boolean algebra	1.4.3b	<ul style="list-style-type: none"> Manipulate Boolean expressions, including the use of Karnaugh maps to simplify Boolean expressions 	How can Karnaugh maps be used to simplify Boolean expressions? (SLR15 slide 4)	SLR15 Activities folder SLR15 Answers folder (Files starting 03)	Logic gates and truth tables	
58	SLR15 – Boolean algebra	1.4.3c	<ul style="list-style-type: none"> Using logic gate diagrams and truth tables 	How do you translate a logic gate diagram into its associated truth table and Boolean expression and vice versa? (SLR15 slide 3)	SLR15 Activities folder SLR15 Answers folder (Files starting 02)		
59	SLR15 – End-of-topic test	End-of-topic test Student self-assessment RAG rating opportunity		Test – SLR15 (slide 8) Self-assess (slide 10)			
60	Independent programming	N/A	Gain experience in practical programming Use our <i>T.I.M.E</i> workbooks, <i>Programming challenges</i> and <i>Defold games tutorials</i> .	Various	Need for operating systems Paging, segmentation and virtual memory		
61	SLR4 – Operating systems	1.2.1a&b	<ul style="list-style-type: none"> The need for, function and purposes of operating systems Memory management (paging, segmentation and virtual memory) 	Why do computers need an operating system like Windows/Linux/macOS? (SLR4 slide 2) How does a computer handle running out of memory and why does it slow down? (SLR4 slide 3)	SLR4 Activities folder SLR4 Answers folder (Files starting 01 & 02)	Interrupts	Operating system, Memory management, Paging, Segmentation, Virtual memory,
62	SLR4 – Operating systems	1.2.1c	<ul style="list-style-type: none"> Interrupts, the role of interrupts and Interrupt Service Routines (ISR), role within the fetch decode execute cycle 	What causes an interrupt to the CPU and how is it handled? (SLR4 slide 4)	SLR4 Activities folder SLR4 Answers folder (Files starting 03)	Scheduling	Interrupt, ISR, Scheduling, RR, FCFS, MLFQ, SJF, SRT, Distributed OS, Embedded OS, Multi-tasking OS, Multi-user
63	SLR4 – Operating systems	1.2.1d	<ul style="list-style-type: none"> Scheduling: round robin, first come first served, multi-level feedback queues, shortest job first and shortest remaining time 	From all the open programs in memory, how does the CPU decide which process to execute? (SLR4 slide 5)	SLR4 Activities folder SLR4 Answers folder (Files starting 04)		

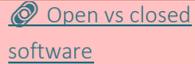
AS Level OCR Computer Science – Scheme of Learning (One-year AS Level method)

Topic focus		Spec ref	Specification learning outcomes	Key question	Activities	HW for next lesson	Key terms
64	SLR4 – Operating systems	1.2.1d	<ul style="list-style-type: none"> Scheduling: round robin, first come first served, multi-level feedback queues, shortest job first and shortest remaining time 	From all the open programs in memory, how does the CPU decide which process to execute? (SLR4 slide 5)	SLR4 Activities folder SLR4 Answers folder (Files starting 04)	 Types of operating system	OS, Real-time OS, BIOS, Device drivers, Virtual machine, Intermediate code
65	SLR4 – Operating systems	1.2.1e	<ul style="list-style-type: none"> Distributed, embedded, multi-tasking, multi-user and real-time operating systems 	What are the features of different types of operating system? (SLR4 slide 6)	SLR4 Activities folder SLR4 Answers folder (Files starting 05)	 BIOS  Device drivers	
66	SLR4 – Operating systems	1.2.1f&g	<ul style="list-style-type: none"> BIOS Device drivers 	What is the relationship between these terms: BIOS, ROM, CMOS, POST, bootstrap and kernel? (SLR4 slide 7) What is the purpose of a device driver? (SLR4 slide 8)	SLR4 Activities folder SLR4 Answers folder (Files starting 06 & 07)	 Virtual machines	
67	SLR4 – Operating systems	1.2.1h	<ul style="list-style-type: none"> Virtual machines, any instance where software is used to take on the function of a machine including executing intermediate code or running an operating system within another 	What is a virtual machine? (SLR4 slide 9)	SLR4 Activities folder SLR4 Answers folder (Files starting 09)		
68	SLR4 – End-of-topic test	End-of-topic test Student self-assessment RAG rating opportunity			Test – SLR4 (slide 10) Self-assess (slide 12)		
69 to 79	Independent programming	N/A	Gain experience in practical programming Use our <i>T.I.M.E</i> workbooks, <i>Programming challenges</i> and <i>Defold games tutorials</i> .		Various		
80 to 84	This is the last week before Christmas. It has been left free in our delivery calendar as a buffer week.						

AS Level OCR Computer Science – Scheme of Learning (One-year AS Level method)

YEAR 12 - TERM 3							
Topic focus	Spec ref	Specification learning outcomes	Key question	Activities	HW for next lesson	Key terms	
					Data Protection Act (superseded by GDPR) Computer Misuse Act		
85	SLR16 – Computer-related legislation	1.5.1a&b	<ul style="list-style-type: none"> The Data Protection Act 2018 (GDPR) The Computer Misuse Act 1990 	What are the principles of the Data Protection laws? (SLR16 slide 2) How does the DPA affect what organisations can and cannot do with stored data? (SLR16 slide 3) What is the purpose of the Computer Misuse Act and what does it prohibit? (SLR16 slide 4)	SLR16 Activities folder SLR16 Answers folder (Files starting 02 & 03)	Copyright Design and Patents Act Investigatory Powers Act	DPA, GDPR, CMD, CDPA, RIPA
86	SLR16 – Computer-related legislation	1.5.1c&d	<ul style="list-style-type: none"> The Copyright Design and Patents Act 1988 The Regulation of Investigatory Powers Act 2000 	What is the purpose of the Copyright Design and Patents Act and what does it prohibit? (SLR16 slide 5) What is the purpose of the Regulation of Investigatory Powers Act and what does it enable? (SLR16 slide 6)	SLR16 Activities folder SLR16 Answers folder (Files starting 04, 05 & 06)		
87	SLR16 – End-of-topic test	End-of-topic test Student self-assessment RAG rating opportunity		Test – SLR16 (slide 7) Self-assess (slide 9)			
88 to 96	Independent programming	N/A	Gain experience in practical programming Use our <i>T.I.M.E</i> workbooks, <i>Programming challenges</i> and <i>Defold games tutorials</i> .	Various	The nature of applications		
97	SLR5 – Application generation	1.2.2a	<ul style="list-style-type: none"> The nature of applications, justifying suitable applications for a specific purpose 	In what ways do typical businesses use applications software?	SLR5 Activities folder SLR5 Answers folder	Utilities	Application, Utilities, Open

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Topic focus	Spec ref	Specification learning outcomes	Key question	Activities	HW for next lesson	Key terms	
			(SLR5 slide 2)	(Files starting 01)	 Open vs closed software	source, Closed source, Source code, Translator, Interpreter, Compiler, Assembler	
98	SLR5 – Application generation	1.2.2b&c	<ul style="list-style-type: none"> Utilities Open source vs Closed source 	How do utilities help to keep your computer safe and in working order? (SLR5 slide 3) What are the considerations for a school between choosing an open or closed learning platform? (SLR5 slide 4)	SLR5 Activities folder SLR5 Answers folder (Files starting 02 & 03)	 Translators	
99	SLR5 – Application generation	1.2.2d	<ul style="list-style-type: none"> Translators: interpreters, compilers and assemblers 	How does a program become the binary code that a computer can execute? (SLR5 slide 5)	SLR5 Activities folder SLR5 Answers folder (Files starting 04)		
100	SLR5 – End-of-topic test	End-of-topic test Student self-assessment RAG rating opportunity		Test – SLR5 (slide 8) Self-assess (slide 10)			
101 to 106	Independent programming	N/A	Gain experience in practical programming Use our <i>T.I.M.E</i> workbooks, <i>Programming challenges</i> and <i>Defold games tutorials</i> .	Various	 Development Methodologies Part 1  Development Methodologies Part 2		
107	SLR6 – Software development	2.2.2a&b	<ul style="list-style-type: none"> Understand the waterfall lifecycle, agile methodologies, extreme programming, the spiral model and rapid application The relative merits and drawbacks of different methodologies and when they might be used 	How are large scale programming projects undertaken? (SLR6 slide 2)	SLR6 Activities folder SLR6 Answers folder (Files starting 01 & 02)		SDLC, Waterfall model, Agile methodologies, Extreme programming, Spiral model, RAD
108	SLR6 – Software development	2.2.2a&b	<ul style="list-style-type: none"> Understand the waterfall lifecycle, agile methodologies, extreme programming, the spiral model and rapid application The relative merits and drawbacks of different methodologies and when they might be used 	What are the advantages and disadvantages of each development methodology? (SLR6 slide 3)	SLR6 Activities folder SLR6 Answers folder (Files starting 01 & 02)	 Algorithms	

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109	SLR6 – Software development	2.2.2c	<ul style="list-style-type: none"> Writing and following algorithms 	What techniques, skills and tools can we use to help us write and follow algorithms? (SLR6 slide 4)	SLR6 Activities folder SLR6 Answers folder (Files starting 03)	Test Strategies	
110	SLR6 – Software development	2.2.2d	<ul style="list-style-type: none"> Different test strategies, including black and white box testing and alpha and beta testing 	What are the features of the different ways a program can be tested? (SLR6 slide 5)	SLR6 Activities folder SLR6 Answers folder (Files starting 04)		
111	SLR6 – Software development	2.2.2d	<ul style="list-style-type: none"> Different test strategies, including black and white box testing and alpha and beta testing 	What are the features of the different ways a program can be tested? (SLR6 slide 5)	SLR6 Activities folder SLR6 Answers folder (Files starting 04)	Test Data and User Feedback	
112	SLR6 – Software development	2.2.2e	<ul style="list-style-type: none"> Test programs that solve problems using suitable test data and end-user feedback, justify a test strategy for a given situation 	What are the features of the different ways a program can be tested? (SLR6 slide 5)	SLR6 Activities folder SLR6 Answers folder (Files starting 05)		
113	SLR6 – End-of-topic test	End-of-topic test Student self-assessment RAG rating opportunity			Test – SLR6 (slide 6) Self-assess (slide 8)	Nature of abstraction Need for abstraction Abstraction and reality	
114	SLR18 – Thinking abstractly	2.2.1a, b & c	<ul style="list-style-type: none"> The nature of abstraction The need for abstraction The differences between abstraction and reality 	What is abstraction and why is it needed? (SLR18 slide 2) How is abstraction used in every-day life? (SLR18 slide 3) What are some examples of abstraction in computer science? (SLR18 slide 4)	SLR18 Activities folder SLR18 Answers folder (Files starting 01, 02 & 03)	Devise an abstract model	Abstraction, Abstract model, Thinking abstractly
115	SLR18 – Thinking abstractly	2.1.1d	<ul style="list-style-type: none"> Devise an abstract model for a variety of situations 	What is meant by an abstract model? Provide some examples. (SLR18 slide 5)	SLR18 Activities folder SLR18 Answers folder (Files starting 04)		
116	SLR18 – End-of-topic test	End-of-topic test Student self-assessment RAG rating opportunity			Test – SLR18 (slide 6) Self-assess (slide 8)	Introduction to data concepts	

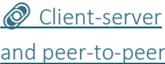
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Topic focus	Spec ref	Specification learning outcomes	Key question	Activities	HW for next lesson	Key terms	
117	SLR10 – Databases	1.3.1a	<ul style="list-style-type: none"> Relational database, flat file, primary key, foreign key, secondary key, entity-relationship modelling, normalisation and indexing 	What are the key terms associated with databases? (SLR10 slide 2)	SLR10 Activities folder SLR10 Answers folder (Files starting 01)		Relational database, Flat file, Primary key, Foreign key, Concatenated primary key, Secondary key,
118	SLR10 – Databases	1.3.1a	<ul style="list-style-type: none"> Relational database, flat file, primary key, foreign key, secondary key, entity-relationship modelling, normalisation and indexing 	What are the key terms associated with databases? (SLR10 slide 2)	SLR10 Activities folder SLR10 Answers folder (Files starting 01)	Methods of capturing data	
119	SLR10 – Databases	1.3.1b	<ul style="list-style-type: none"> Methods of capturing, selecting, managing and exchanging data 	How can data be captured and exchanged for databases? (SLR10 slide 3)	SLR10 Activities folder SLR10 Answers folder (Files starting 02)		
120	SLR10 – End-of-topic test	End-of-topic test Student self-assessment RAG rating opportunity		Test – SLR10 (slide 7) Self-assess (slide 9-10)			

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YEAR 12 - TERM 4							
Topic focus	Spec ref	Specification learning outcomes	Key question	Activities	HW for next lesson	Key terms	
121-126	Term 1-3 assessment opportunity	The lessons in this first week back have been set aside to carry out a mock exam and marking with the students on the material covered in terms 1-3.					
					Network characteristics and protocols		
127	SLR11 – Networks	1.3.2a	<ul style="list-style-type: none"> Characteristics of networks and the importance of protocols and standards 	<p>What is a network and why are they more useful than stand-alone computers? (SLR11 slide 2)</p> <p>What are the definitions of standards and protocols, and why are they needed? (SLR11 slide 3)</p> <p>What are the typical standards and protocols used in networking today? (SLR11 slide 4)</p>	SLR11 Activities folder SLR11 Answers folder (Files starting 01)	TCP IP, DNS and Protocol layers	Protocol, TCP/IP stack, DNS, Protocol layering, LAN, WAN, Packet switching, Circuit switching, Client-server, Peer to peer
128	SLR11 – Networks	1.3.2a&b	<ul style="list-style-type: none"> Characteristics of networks and the importance of protocols and standards Internet structure: -The TCP/IP Stack -DNS -Protocol layering -LANs and WANs -Packet and circuit switching 	<p>What does protocol layering mean and why is it needed? (SLR11 slide 5)</p> <p>How does the internet work using TCP/IP? (SLR11 slide 6)</p> <p>How does the domain name system work using recursive domain name servers? (SLR 11 slide 7)</p>	SLR11 Activities folder SLR11 Answers folder (Files starting 01, 02 & 03)	LANS & WANS Packet and circuit switching	
129	SLR11 – Networks	1.3.2b	<ul style="list-style-type: none"> Internet structure: -The TCP/IP Stack -DNS -Protocol layering -LANs and WANs -Packet and circuit switching 	<p>How does circuit switching work? (SLR11 slide 8)</p> <p>How does packet switching work? (SLR11 slide 9)</p> <p>What are the differences between local and wide area networks? (SLR11 slide 10)</p>	SLR11 Activities folder SLR11 Answers folder (Files starting 01, 02 & 03)		

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Topic focus	Spec ref	Specification learning outcomes	Key question	Activities	HW for next lesson	Key terms	
130	SLR11 – Networks	1.3.2b	<ul style="list-style-type: none"> Internet structure: -The TCP/IP Stack -DNS -Protocol layering -LANs and WANs -Packet and circuit switching 	All previous questions.	SLR11 Activities folder SLR11 Answers folder (Files starting 07)	 Client-server and peer-to-peer	
131	SLR11 – Networks	1.3.2c	<ul style="list-style-type: none"> Client-server and Peer to Peer 	What are the differences between a client-server and peer-to-peer network topology? (SLR11 slide 13)	SLR11 Activities folder SLR11 Answers folder (Files starting 06)		
132	SLR11 – End-of-topic test	End-of-topic test Student self-assessment RAG rating opportunity		Test – SLR11 (slide 14) Self-assess (slide 16)	 HTML		
133	SLR12 – Web technologies	1.3.3a	<ul style="list-style-type: none"> HTML, CSS and JavaScript 	How does a browser display a web page using HTML and CSS? (SLR12 slide 2) Provide an example of JavaScript. (SLR12 slide 3)	SLR12 Activities folder SLR12 Answers folder (Files starting 01)	 CSS	HTML, CSS, JavaScript
134	SLR12 – Web technologies	1.3.3a	<ul style="list-style-type: none"> HTML, CSS and JavaScript 	How does a browser display a web page using HTML and CSS? (SLR12 slide 2) Provide an example of JavaScript. (SLR12 slide 3)	SLR12 Activities folder SLR12 Answers folder (Files starting 01)	 JavaScript	
135	SLR12 – Web technologies	1.3.3a	<ul style="list-style-type: none"> HTML, CSS and JavaScript 	How does a browser display a web page using HTML and CSS? (SLR12 slide 2) Provide an example of JavaScript. (SLR12 slide 3)	SLR12 Activities folder SLR12 Answers folder (Files starting 01)		
136	SLR12 – Web technologies	1.3.3a	<ul style="list-style-type: none"> HTML, CSS and JavaScript 	How does a browser display a web page using HTML and CSS? (SLR12 slide 2) Provide an example of JavaScript. (SLR12 slide 3)	SLR12 Activities folder SLR12 Answers folder (Files starting 01)		
137	SLR12 – Web technologies	1.3.3a	<ul style="list-style-type: none"> HTML, CSS and JavaScript 	How does a browser display a web page using HTML and CSS? (SLR12 slide 2)	SLR12 Activities folder SLR12 Answers folder (Files starting 01)		

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Topic focus	Spec ref	Specification learning outcomes	Key question	Activities	HW for next lesson	Key terms	
			Provide an example of JavaScript. (SLR12 slide 3)				
138	SLR12 – Web technologies	1.3.3a	<ul style="list-style-type: none"> HTML, CSS and JavaScript 	<p>How does a browser display a web page using HTML and CSS? (SLR12 slide 2)</p> <p>Provide an example of JavaScript. (SLR12 slide 3)</p>	<p>SLR12 Activities folder</p> <p>SLR12 Answers folder (Files starting 01)</p>	 Lossy vs Lossless	
139	SLR12 – Web technologies	1.3.3b	<ul style="list-style-type: none"> Lossy v lossless compression 	<p>What is the difference between lossy and lossless compression, and what are the limitations of each? (SLR12 slide 6)</p>	<p>SLR12 Activities folder</p> <p>SLR12 Answers folder (Files starting 02)</p>		
140	SLR12 – End-of-topic test	<p>End-of-topic test</p> <p>Student self-assessment RAG rating opportunity</p>		<p>Test – SLR12 (slide 7)</p> <p>Self-assess (slide 9)</p>	 Moral, social and ethical issues Part 1		
141	SLR17 – Ethical, moral and cultural issues	1.5.2a	<ul style="list-style-type: none"> The individual (moral), social (ethical) and cultural opportunities and risks of digital technology: <ul style="list-style-type: none"> Computers in the workforce Automated decision making Artificial intelligence 	<p>Topic for consideration: Computers in the workforce: moral, ethical and social issues.</p> <p>Topic for consideration: Automated decision making: moral, ethical and social issues.</p> <p>Topic for consideration: Artificial intelligence: moral, ethical and social issues. (SLR17 slide 2-4)</p>	<p>SLR17 Activities folder</p> <p>SLR17 Answers folder (Files starting 01)</p>	 Moral, social and ethical issues Part 2  Moral, social and ethical issues Part 3	Ethical issues, Moral issues, Cultural issues, Environmental issues
142	SLR17 – Ethical, moral and cultural issues	1.5.2a	<ul style="list-style-type: none"> The individual (moral), social (ethical) and cultural opportunities and risks of digital technology: <ul style="list-style-type: none"> Environmental effects Censorship and the Internet Monitor behaviour 	<p>Topic for consideration: Environmental effects of computer science: moral, ethical and social issues.</p> <p>Topic for consideration: Censorship and the Internet: moral, ethical and social issues.</p> <p>Topic for consideration: Monitoring behaviour: moral, ethical and social issues. (SLR17 slide 5-7)</p>	<p>SLR17 Activities folder</p> <p>SLR17 Answers folder (Files starting 01)</p>	 Moral, social and ethical issues Part 4  Moral, social and ethical issues Part 5	

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Topic focus	Spec ref	Specification learning outcomes	Key question	Activities	HW for next lesson	Key terms
143 SLR17 – Ethical, moral and cultural issues	1.5.2a	<ul style="list-style-type: none"> The individual (moral), social (ethical) and cultural opportunities and risks of digital technology: <ul style="list-style-type: none"> Analyse personal information Piracy and offensive communications Layout, colour paradigms and character sets 	<p>Topic for consideration: Analysing personal information: moral, ethical and social issues.</p> <p>Topic for consideration: Piracy and offensive communications: moral, ethical and social issues.</p> <p>Topic for consideration: Interface layout, colour paradigms and character sets (SLR17 slide 8-10)</p>	SLR17 Activities folder SLR17 Answers folder (Files starting 01)		
144 SLR17 – End-of-topic test	End-of-topic test Student self-assessment RAG rating opportunity			Test – SLR17 (slide 11) Self-assess (slide 13)	Arrays, records, lists and tuples Tuples, static or dynamic	
145 SLR14 – Data structures	1.4.2a	<ul style="list-style-type: none"> Arrays (of up to 3 dimensions), records, lists, tuples 	What are the differences between arrays, lists and tuples? (SLR14 slide 2)	SLR14 Activities folder SLR14 Answers folder (Files starting 01)	Stacks and queues	Array, Records, Lists, Tuple, Stack, Queue
146 SLR14 – Data structures	1.4.2b	<ul style="list-style-type: none"> The properties of stacks and queues 	<p>How do the operations push and pop work with a stack stored as an array? (SLR14 slide 3)</p> <p>How do the operations enqueue and dequeue work with a queue stored as an array? (SLR14 slide 4)</p> <p>What are the uses of stacks and queues in computer science? (SLR14 slide 5)</p>	SLR14 Activities folder SLR14 Answers folder (Files starting 02 & 03)		
147 SLR14 – Data structures	1.4.2b	<ul style="list-style-type: none"> The properties of stacks and queues 	<p>How do the operations push and pop work with a stack stored as an array? (SLR14 slide 3)</p> <p>How do the operations enqueue and dequeue work with a queue stored as an array?</p>	SLR14 Activities folder SLR14 Answers folder (Files starting 02 & 03)		

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Topic focus	Spec ref	Specification learning outcomes	Key question	Activities	HW for next lesson	Key terms
			(SLR14 slide 4) What are the uses of stacks and queues in computer science? (SLR14 slide 5)			
148	SLR14 – End-of-topic test	End-of-topic test Student self-assessment RAG rating opportunity		Test – SLR14 (slide 13) Self-assess (slide 15)	Intro to programming – Part 1, program flow Intro to programming – Part 2, variables and constants Intro to programming – Part 3, procedures and functions	
149	SLR8 – Introduction to programming	1.2.3a <ul style="list-style-type: none"> Procedural programming language techniques: program flow, variables and constants, procedures and functions, arithmetic, Boolean and assignment operators, string handling, file handling 	What are the three primary programming constructs? (SLR8 slide 2) What is the difference between variables and constants and how can they be used? (SLR8 slide 3) What is the difference between a procedure and a function and how do we pass parameters to them? (SLR8 slide 4)	SLR8 Activities folder SLR8 Answers folder (Files starting 01)	Intro to programming – Part 4, mathematical operators Intro to programming – Part 5, string handling Intro to programming – Part 6, file handling	Sequence, Selection, Iteration, Variables, Constants, Procedures, Functions, Arithmetic operators, Boolean operators, Assignment operators, String handling, File handling, LMC
150	SLR8 – Introduction to programming	1.2.3a <ul style="list-style-type: none"> Procedural programming language techniques: program flow, variables and constants, procedures and functions, arithmetic, Boolean and assignment operators, string handling, file handling 	What are the common arithmetic / logical and Boolean operators used in procedural programming? (SLR8 slide 5) What is string handling in programming and what are some of the most common string handling operations?	SLR8 Activities folder SLR8 Answers folder (Files starting 01)	Assembly language and LMC language	Assignment operators, String handling, File handling, LMC

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	Topic focus	Spec ref	Specification learning outcomes	Key question	Activities	HW for next lesson	Key terms
				(SLR8 slide 6) How do you read from and write to a simple text file? (SLR8 slide 7)			
151	SLR8 – Introduction to programming	1.2.3b	<ul style="list-style-type: none"> Assembly language (including following and writing programs with Little Man Computer) 	What are assembly code and the Little Man Computer language? (SLR8 slide 8)	SLR8 Activities folder SLR8 Answers folder (Files starting 02)		
152	SLR8 – Introduction to programming	1.2.3b	<ul style="list-style-type: none"> Assembly language (including following and writing programs with Little Man Computer) 	What are assembly code and the Little Man Computer language? (SLR8 slide 8)	SLR8 Activities folder SLR8 Answers folder (Files starting 02)		
153	SLR8 – Introduction to programming	1.2.3b	<ul style="list-style-type: none"> Assembly language (including following and writing programs with Little Man Computer) 	What are assembly code and the Little Man Computer language? (SLR8 slide 8)	SLR8 Activities folder SLR8 Answers folder (Files starting 02)		
154	SLR8 – Introduction to programming	1.2.3b	<ul style="list-style-type: none"> Assembly language (including following and writing programs with Little Man Computer) 	What are assembly code and the Little Man Computer language? (SLR8 slide 8)	SLR8 Activities folder SLR8 Answers folder (Files starting 02)		
155	SLR8 – End-of-topic test	End-of-topic test Student self-assessment RAG rating opportunity			Test – SLR8 (slide 9) Self-assess (slide 11)		
156	Buffer lesson	Use this extra lesson as you see fit					

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YEAR 12 - TERM 5							
Topic focus	Spec ref	Specification learning outcomes	Key question	Activities	HW for next lesson	Key terms	
					Programming constructs Global and local variables		
157	SLR23 – Programming techniques	3.3.2a&b	<ul style="list-style-type: none"> Programming constructs: sequence, iteration, branching Global and local variables 	What are the 3 basic programming constructs? (SLR23 slide 2) What is the difference between local and global variables and when should they be used? (SLR23 slide 3)	SLR23 Activities folder SLR23 Answers folder (Files starting 01 & 02)	Functions and procedures	Sequence, Selection, Iteration, Global variable, Local variables, Modularity, Procedure, Function, Parameters, Parameter passing, Parameter passing by value, Parameter passing by reference, IDE, Debugging
158	SLR23 – Programming techniques	3.3.2c	<ul style="list-style-type: none"> Modularity, functions and procedures, parameter passing by value and reference 	What is the difference between procedures and functions, and what is the difference between passing parameters by value and by reference? (SLR23 slide 4)	SLR23 Activities folder SLR23 Answers folder (Files starting 03 & 04)	IDEs	
159	SLR23 – Programming techniques	3.3.2d	<ul style="list-style-type: none"> Use of an IDE to develop/debug a program 	What are the features of an IDE? (SLR23 slide 5)	SLR23 Activities folder SLR23 Answers folder (Files starting 05)		
160	SLR23 – End-of-topic test	End-of-topic test Student self-assessment RAG rating opportunity		Test – SLR23 (slide 8) Self-assess (slide 11)	Identify inputs and outputs Determining preconditions		
161	SLR19 – Thinking ahead	2.1.2a&b	<ul style="list-style-type: none"> Identify the inputs and outputs for a given situation Determine the preconditions for devising a solution to a problem 	What are the inputs and outputs of a real-world system? (SLR19 slide 2) What are preconditions for devising a solution to a problem? (SLR19 slide 3)	SLR19 Activities folder SLR19 Answers folder (Files starting 01 & 02)	Reusable program components	Thinking ahead, System inputs, System outputs, Solution preconditions

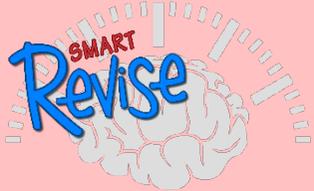
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	Topic focus	Spec ref	Specification learning outcomes	Key question	Activities	HW for next lesson	Key terms
162	SLR19 – Thinking ahead	2.1.2b&c	<ul style="list-style-type: none"> The need for reusable program components 	What are the benefits and drawbacks of reusable program components? (SLR19 slide 4)	SLR19 Activities folder SLR19 Answers folder (Files starting 03)		
163	SLR19 – End-of-topic test	End-of-topic test Student self-assessment RAG rating opportunity			Test – SLR19 (slide 6) Self-assess (slide 8)	Identify components of a problem Identify components of a solution	
164	SLR20 – Thinking procedurally	2.1.3a&b	<ul style="list-style-type: none"> Identify the components of a problem Identify the components of a solution to a problem 	How can a system diagram be used to represent a computing problem? (SLR20 slide 2) How are flowcharts used to define algorithms? (SLR20 slide 3)	SLR20 Activities folder SLR20 Answers folder (Files starting 01 & 02)	Steps to solve a problem Identify subprocedures	Thinking procedurally
165	SLR20 – Thinking procedurally	2.1.3c&d	<ul style="list-style-type: none"> Determine the order of the steps needed to solve a problem Identify sub-procedures necessary to solve a problem 	How is pseudocode used as an alternative to flowcharts? (SLR20 slide 4) What are sub-procedures, and how do they help to construct a complete solution to a problem? (SLR20 slide 5)	SLR20 Activities folder SLR20 Answers folder (Files starting 03 & 04)		
166	SLR20 – End-of-topic test	End-of-topic test Student self-assessment RAG rating opportunity			Test – SLR20 (slide 6) Self-assess (slide 8)	Decisions and program flow Determine logical conditions	
167	SLR21 – Thinking logically	2.1.4a&b	<ul style="list-style-type: none"> Identify the points in a solution where a decision has to be taken Determine the logical conditions that affect the outcome of a decision 	What is meant by the term “decision points” in a program? (SLR21 slide 2)	SLR21 Activities folder SLR21 Answers folder (Files starting 00, 01 & 02)	Decision points in a solution	Thinking logically
168	SLR21 – Thinking logically	2.1.4b&c	<ul style="list-style-type: none"> Determine the logical conditions that affect the outcome of a decision 	How do decisions affect the flow of a program?	SLR21 Activities folder SLR21 Answers folder		

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Topic focus	Spec ref	Specification learning outcomes	Key question	Activities	HW for next lesson	Key terms
		<ul style="list-style-type: none"> Determine how decisions affect flow through a program 	(SLR21 slide 3)	(Files starting 03)		
169	SLR21 – End-of-topic test	End-of-topic test Student self-assessment RAG rating opportunity		Test – SLR21 (slide 4) Self-assess (slide 6)	Analysis and design of algorithms	
170	SLR25 – Algorithms	2.3.1a <ul style="list-style-type: none"> Analysis and design of algorithms for a given situation 	None for this lesson	None for this lesson	Standard algorithms Implement bubble sort	Algorithm, Bubble sort, Insertion sort, Binary search, Linear search, Stacks, Queues
171	SLR25 – Algorithms	2.3.1b&c <ul style="list-style-type: none"> Standard algorithms (bubble sort, insertion sort, binary search and linear search) Implement bubble sort, insertion sort 	How does the bubble sort work? (SLR25 slide 2) How does the insertion sort work? (SLR25 slide 3)	SLR25 Activities folder SLR25 Answers folder (Files starting 01 & 02)	Implement insertion sort	
172	SLR25 – Algorithms	2.3.1b&c <ul style="list-style-type: none"> Standard algorithms (bubble sort, insertion sort, binary search and linear search) Implement bubble sort, insertion sort 	How does the bubble sort work? (SLR25 slide 2) How does the insertion sort work? (SLR25 slide 3)	SLR25 Activities folder SLR25 Answers folder (Files starting 01 & 02)	Implement linear search	
173	SLR25 – Algorithms	2.3.1b&d <ul style="list-style-type: none"> Standard algorithms (bubble sort, insertion sort, binary search and linear search) Implement binary and linear search 	How does the linear search work? (SLR25 slide 4) How does the binary search work? (SLR25 slide 5)	SLR25 Activities folder SLR25 Answers folder (Files starting 03)	Implement binary search	
174	SLR25 – Algorithms	2.3.1b&d <ul style="list-style-type: none"> Standard algorithms (bubble sort, insertion sort, binary search and linear search) Implement binary and linear search 	How does the linear search work? (SLR25 slide 4) How does the binary search work? (SLR25 slide 5)	SLR25 Activities folder SLR25 Answers folder (Files starting 03)	Representing, adding and removing from queues and stacks	
175	SLR25 – Algorithms	2.3.1e <ul style="list-style-type: none"> Representing, adding data to and removing data from queues and stacks 	How do stacks and queues work? (SLR25 slide 6)	SLR25 Activities folder SLR25 Answers folder (Files starting 05)		
176	SLR25 – Algorithms	2.3.1e <ul style="list-style-type: none"> Representing, adding data to and removing data from queues and stacks 	How do stacks and queues work? (SLR25 slide 6)	SLR25 Activities folder SLR25 Answers folder (Files starting 05)	Comparing suitability of algorithms	

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177	SLR25 – Algorithms	2.3.1f	<ul style="list-style-type: none"> Compare the suitability of different algorithms for a given task and data set 	None for this lesson	SLR25 Activities folder SLR25 Answers folder (Files starting 04)	
178	SLR25 – End-of-topic test	End-of-topic test Student self-assessment RAG rating opportunity		Test – SLR25 (slide 7-8) Self-assess (slide 10)		
179	Revision	<p>This period is given over to revision. We have many resources to help with revision, including:</p> <ul style="list-style-type: none"> A dedicated FREE site for students with all our videos and downloadable cheat sheets: student.craigndave.org A series of videos on exam technique, including how to understand command words and answer extended questions: student.craigndave.org/videos/exam-technique 				
180	Revision					
181	Revision					
182	Revision					
183	Revision					
184	Revision					
185	Revision					
186	Revision	<p>We also have a dedicated revision app called Smart Revise with over a thousand questions. It has a pin-sharp focus on the specification and every single bullet point is covered.</p> <ul style="list-style-type: none"> For a summary and to share with your colleagues, visit smartrevise.craigndave.org To get started with a free trial, visit www.smartrevise.online To check out our overview videos, visit our YouTube channel https://youtu.be/YQDLfcy7xSM 				