

Scheme of Work 2020 - 2021
Subject: Computer Science

Year Group: 10

Specification: AQA GCSE Computer Science

Lesson No	Topic & Objectives	Big Question – What will students learn?	Key Activities & Specialist Terminology (Do Now Task / Starter/Tasks/Plenary)	Planned Assessment	Homework or flipped learning resources DODDLE resources	Lit Num SMSC Codes
WB 5 th Jan	Truth gates and circuits	<p>Construct truth tables for NOT, AND, OR gates,</p> <p>Construct truth tables for simple logic circuits and interpret them.</p> <p>Create simple logic circuit diagrams.</p>	<p>Be able to construct truth tables for gates and circuits.</p> <p>Be able to draw logic circuits to represent a simple logic problem.</p>	<p>Purple book –End of Topic Assessment</p> <p>Class activities/exercises – Green book</p> <p>Asking appropriate questions in CATs</p>	<p>Research on keywords and definitions</p> <p>Muddiest point</p> <p>Documented problem solutions</p> <p>Directed paraphrasing</p> <p>Classroom opinion polls</p> <p>Look at truth tables for each gate.</p> <p>Online logic gate simulator</p> <p>Notes and video on logic circuits and Boolean expressions (note XOT not required)</p>	Sp3 Sp7

WB 11 th Jan	CPU & Fetch-Execute Cycle	<p>Explain Von Neumann architecture.</p> <p>Explain role of main memory, components of CPU, buses.</p> <p>Understand and explain the fetch-execute cycle.</p>	<p>A good way to introduce this is to have old PCs that students can look inside of to identify the component parts. This could be done with photographs but having real PCs makes it more interesting.</p> <p>The role of the components needs to be explained.</p> <p>Students only need a high-level understanding of the fetch-execute cycle. They don't need to know the details of register operations etc.</p> <p>A range of online simulators can be used to illustrate this.</p>		<p>Research on keywords and definitions</p> <p>Muddiest point</p> <p>Documented problem solutions</p> <p>Directed paraphrasing</p> <p>Classroom opinion polls</p>	<p>C1</p> <p>C2</p> <p>C3</p> <p>C7</p> <p>Sp3</p> <p>Sp9</p>
WB 18 th Jan	RAM and ROM	<p>Understand difference between main memory and secondary storage and between RAM and ROM. Be able to explain volatile and non-volatile.</p> <p>Explain the effect of clock speed, number of cores and cache size on processor performance.</p>	<p>This is not a very practical topic. Most of the content is probably best explained to the students by the teacher, although students could be asked to research parts of it e.g. what cache is and how it improves performance.</p> <p>With regard to RAM and ROM, it is helpful to focus on their uses.</p>	<p>Purple book –End of Topic Assessment</p> <p>Class activities/exercises – Green book</p> <p>Asking appropriate questions in CATs</p>	<p>Research on keywords and definitions</p> <p>Muddiest point</p> <p>Documented problem solutions</p> <p>Directed paraphrasing</p> <p>Classroom opinion polls</p>	<p>C1</p> <p>C2</p> <p>C3</p> <p>C7</p> <p>Sp3</p> <p>Sp9</p>
WB 25 th Jan	Secondary Storages	<p>Be aware of why secondary storage is needed and the</p>	<p>It is useful to have physical devices for students to look at here – a disassembled hard disk drive</p>	<p>Purple book –End of Topic Assessment</p>	<p>Research on keywords and definitions</p>	<p>Sp3</p>

		<p>different types of secondary storage.</p> <p>Explain the operation of solid state, optical and magnetic storage.</p> <p>Discuss their relative advantages.</p> <p>Explain what cloud storage is and compare it to local storage</p>	<p>and CD-ROM drive or similar. There is less of interest that can be seen inside a solid state drive.</p> <p>There are also lots of animations available on the Internet on websites such as howstuffworks.com, which illustrate the principles behind the operation of these devices.</p> <p>Students could make a presentation to explain how each device works.</p> <p>The relative advantages of the devices should be considered in relation to criteria such as maximum capacity, cost per megabyte, robustness, power consumption and portability.</p> <p>Many students will be familiar with using cloud storage such as OneDrive or Apple or Google's cloud storage systems so this aspect of the specification would work well as a discussion with students explaining what they use it for and considering the practical benefits they have seen themselves, but also the risks.</p>	<p>Class activities/exercises – Green book</p> <p>Asking appropriate questions in CATs</p>	<p>Muddiest point</p> <p>Documented problem solutions</p> <p>Directed paraphrasing</p> <p>Classroom opinion polls</p>	
WB 1St Feb	Embedded Systems	<p>Understand the term 'embedded system' and explain how an embedded system differs from a non-embedded system.</p>	<p>This is a relatively small topic. Students need to understand that many computer systems are embedded in other devices and the constraints and differences that this produces when compared with non-embedded systems.</p> <p>Students could be given some scenarios (e.g. washing machine) and be asked to consider what functionality the system would need and why a non-embedded system would not be suitable.</p>	<p>Assessment for CPU – secondary storage and Embedded systems</p> <p>Purple book –End of Topic Assessment</p> <p>Class activities/exercises – Green book</p>	<p>Research on keywords and definitions</p> <p>Muddiest point</p> <p>Documented problem solutions</p> <p>Directed paraphrasing</p> <p>Classroom opinion polls</p>	<p>C1</p> <p>C2</p> <p>C3</p> <p>Sp3</p> <p>Sp9</p>

			Differences such as processor speed, amount and type of main memory, secondary storage, input and output devices and upgradeability could be considered.	Asking appropriate questions in CATs		
WB 8 th Feb	Hardware and software	<p>Define the terms hardware and software and understand the relationship between them.</p> <p>Explain what is meant by systems software and application software and be able to give examples of them.</p> <p>Understand the need for and functions of the OS and utility programs.</p>	<p>This is very much a theory topic so is probably best delivered by the teacher talking and discussing with the class.</p> <p>For the first point, students simply need to know that hardware is that the electronic or electro-mechanical components of the computer and that software are the programs that run on the hardware and tell it what to do to perform a task.</p> <p>Students need to know that application software completes user-oriented tasks that the user would need to do with or without a computer whereas system software performs tasks related to the management of the computer system.</p> <p>Students need to know that the OS manages processor(s), memory, I/O devices, applications and security but do not need to know how.</p> <p>A utility is a program that helps manage a computer but is not core to its operation eg a compression program, a virus-checker. It might be useful to make students aware that utilities are increasingly being bundled with the OS.</p>	<p>Purple book –End of Topic Assessment</p> <p>Asking appropriate questions in CATs</p> <p>Minute Paper</p>	<p>Iteration Homework</p> <p>Research on keywords and definitions</p> <p>Documented problem solutions</p> <p>senecalearning.com</p> <p>doddlelearn.co.uk</p>	<p>C1</p> <p>C2</p> <p>C3</p> <p>Sp3</p>
WB 22 nd Feb	Networks	Students should be able to explain what a computer network is, discuss risks and benefits of networks and the relative merits of	Students will have direct experience of using networks, both wired and wireless, so this makes a good discussion topic – pros and cons	<p>Purple book –End of Topic Assessment</p> <p>Asking appropriate questions in CATs</p>	<p>senecalearning.com</p> <p>Research on: -Video showing use of MAC address whitelist</p>	<p>C1</p> <p>C2</p> <p>C3</p> <p>Sp3</p>

		<p>wired and wireless networking</p> <p>Students can describe LAN, WAN and PAN and understand star and bus topologies, including their relative merits</p>	<p>of having a network and also of wired vs wireless networks.</p> <p>Differences between LAN and WAN should be considered in terms of size, ownership and the hardware used.</p> <p>Topologies are best visualised; it is worth noting that physical bus networks have limited applications nowadays.</p> <p>This topic can be taught as a discussion or there are many online videos and resources.</p>	Minute Paper	<p>-Very short video on firewalls</p> <p>Iteration Homework</p> <p>Documented problem solutions</p> <p>doddlelearn.co.uk</p>	<p>Sp4</p> <p>Sp7</p>
<p>WB 1st</p> <p>Mar</p>	<p>Protocols</p>	<p>Define the term 'network protocol'.</p> <p>Explain the purpose and use of common network protocols including: Ethernet, Wi-Fi, TCP, UDP, IP, HTTP, HTTPS, FTP, SMTP, IMAP.</p> <p>Understand the need for, and importance of, network security.</p> <p>Explain the following methods of network security: authentication, encryption, firewall, MAC address filtering.</p>	<p>This topic is a fairly theoretical one. Students could use textbooks, online notes or videos to learn from.</p> <p>They need to understand why a stack is used (abstraction), what the four layers are and some functions of each layer of the stack and at which layers the listed protocols work.</p>	<p>Purple book –End of Topic Assessment</p> <p>Asking appropriate questions in CATs</p> <p>Minute Paper</p>	<p>senecalearning.com</p> <p>doddlelearn.co.uk</p>	<p>C1</p> <p>Sp2</p> <p>Sp3</p>

<p>WB 8th Mar</p>	<p>TCP Layers</p>	<p>Students should know what the four layers are and some functions of each layer, together with which of the protocols listed operate at which layer.</p>	<p>This topic is a fairly theoretical one. Students could use textbooks, online notes or videos to learn from.</p> <p>They need to understand why a stack is used (abstraction), what the four layers are and some functions of each layer of the stack and at which layers the listed protocols work.</p>	<p>Purple book –End of Topic Assessment</p> <p>Asking appropriate questions in CATs</p> <p>Minute Paper</p>	<p>Video tutorial - Youtube senecalearning.com</p> <p>doddlelearn.co.uk</p>	<p>C1 C2 C3 Sp3</p>
<p>WB 15th Mar</p>	<p>Cyber Security</p>	<p>Be able to explain cyber security and the cyber security threats covered by the specification.</p>	<p>This topic works well as a class discussion as most students will be familiar with some of these topics from their own personal experiences.</p> <p>Students could make a presentation, each focusing on one or more topics.</p>	<p>Purple book –End of Topic Assessment</p> <p>Asking appropriate questions in CATs</p> <p>Minute Paper</p>	<p>Documentary on cybercrime in the UK</p> <p>Five of the worst computer viruses</p> <p>Notes on some topics of computer security senecalearning.com</p> <p>doddlelearn.co.uk</p>	<p>M8 C1 C2 C3 Sp3</p>
<p>WB 22TH Mar</p>	<p>Protection</p>	<p>Be able to describe methods that are suitable for protecting from cyber security threats</p>	<p>This topic woks well as a discussion, as students will be aware of some of these topics from their own experiences. They may need to be focused somewhat to ensure that they cover all of the topics on the specification.</p>	<p>Purple book –End of Topic Assessment</p> <p>Asking appropriate questions in CATs</p> <p>Minute Paper</p>	<p>Novalabs cyber security protection game senecalearning.com</p> <p>Cyber security threats and solutions doddlelearn.co.uk</p>	<p>M8 C1 C2 C3 Sp3 Sp4 Sp7</p>