Computer Science Framework for Learning 2022-2023

OCR GCSE COMPUTER SCIENCE - J277

<table>
<tr><td>Year Group</td><td colspan="6">Year 11</td></tr>
<tr><td>Subject Intent</td><td colspan="6">Computer Science encourages students to:

★ Understand and apply the fundamental principles and concepts of Computer Science, including abstraction, decomposition, logic, algorithms, and data representation
★ Analyse problems in computational terms through practical experience of solving such problems, including designing, writing and debugging programs
★ Think creatively, innovatively, analytically, logically and critically
★ Understand the components that make up digital systems, and how they communicate with one another and with other systems
★ Understand the impacts of digital technology to the individual and to wider society
★ Apply mathematical skills relevant to Computer Science</td></tr>
<tr><td>Subject Implementation</td><td>Autumn 1</td><td>Autumn 2</td><td>Spring 1</td><td>Spring 2</td><td>Summer 1</td><td>Summer 2</td></tr>
<tr><td rowspan="2">Knowledge</td><td colspan="2">Student will develop an understanding of:

Component 1:
➔ Networks and topologies
➔ Wired and wireless networks, protocols and layers

Component 2:
➔ Languages
➔ The Integrated Development Environment (IDE)</td><td colspan="2">Student will develop an understanding of:

Component 1:
➔ Ethical, legal, cultural and environmental impact

Component 2:
➔ Final Practical Programming Skills Tasks and Revision/Intervention</td><td colspan="2" rowspan="2">GCSE EXAMS</td></tr>
<tr><td colspan="4"><u>Practical Programming</u> - All students must be given the opportunity to undertake a programming task(s), either to a specification or to solve a problem (or problems), during their course of study. Students may draw on some of the content in <u>both components</u> when engaged in Practical Programming.</td></tr>
<tr><td>Skills</td><td colspan="2"><u>COMPONENT 1</u>
<u>Students will study:</u></td><td colspan="2"><u>COMPONENT 1</u>
<u>Students will study:</u></td><td colspan="2">GCSE EXAMS</td></tr>
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	1.3.1 Networks and topologies - Types of networks: o 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: o Wireless access points, Routers, Switches, NIC (Network Interface Controller/Card), Transmission media - The Internet as a worldwide collection of computer networks: o DNS (Domain Name Server), Hosting, The Cloud, Web Servers and Clients, - Star and Mesh network topologies **1.3.2 Wired and wireless networks, protocols and layers** - Modes of connection: o Wired - Ethernet o Wireless - Wi-Fi and Bluetooth - Encryption - IP addressing and MAC addressing - Standards - Common protocols including: o TCP/IP (Transmission Control Protocol/Internet Protocol), HTTP (HyperText Transfer Protocol), HTTPS (HyperText 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 **COMPONENT 2**	**1.6.1 Ethical, legal, cultural and environmental impact** - Impacts of digital technology on wider society including: o Ethical issues o Legal issues o Cultural issues o Environmental issues o Privacy issues - Legislation relevant to Computer Science: o The Data Protection Act 2018 o Computer Misuse Act 1990 o Copyright Designs and Patents Act 1988 o Software licences (i.e. open source and proprietary) **COMPONENT 2** **Students will study:** **Final Practical Programming Skills Tasks and all units Revision/Intervention** All students must be given the opportunity to undertake a programming task or tasks during their course of study. The programming task(s) will allow students to develop skills within the following areas when programming: • Design, Write, Test, Refine Each task(s) will require a high-level text based solution using the programming language **PYTHON**. Practical Programming skills will be assessed in Component 2 of the qualification, in particular Section B.	

	Students will study: **2.5.1 Languages** - Characteristics and purpose of different levels of programming language: o High-level languages, Low-level languages - The purpose of translators - The characteristics of a compiler and an interpreter **2.5.2 The Integrated Development Environment (IDE)** - Common tools and facilities available in an integrated development environment (IDE): o Editors o Error diagnostics o Run-time environment o Translators		
Subject Impact	The GCSE Computer Science course will enable students to develop a real, in-depth understanding of how computer technology works, giving them an insight into what goes on 'under the lid' of a computer. You will need to think creatively, innovatively and logically to design and program solutions to real-world problems. Students will investigate the components that make up digital systems and how they communicate with one another and with other systems. They will also develop an understanding of the impacts of digital technology to the individual and to the wider society.		
Assessment	★ Formative Assessments at the end of each lesson topic, ***for e.g. Class work, Homework, Presentation, Short Recall Test, Practical Project, Quiz*** ★ 1 Summative assessment - PPE1 **(Summative assessment covers content taught in GCSE course, to date)**	★ Formative Assessments at the end of each lesson topic, ***for e.g. Class work, Homework, Presentation, Short Recall Test, Practical Project, Quiz*** ★ 1 Summative assessment - PPE2 **(Summative assessment covers entire GCSE specification)**	**GCSE EXAMS**