

Intent

Introduction

By exploring the challenges faced by pioneering 20th century computer scientists and designers, an insight is provided into why and how computers are designed and work in the way they do. The intention of the curriculum is to both explore and try to answer the same questions that these pioneers had so as to stimulate an interest in and encourage a passion for Computer Science and ICT. These fundamental questions are:

- How do we store and represent data that in turn allows other processes to be completed?
- How can we control computers?
- How do we enable computers to communicate and share data?

At Key Stage 3 the aim is allow students to gain an understanding of these core concepts so a successful transition to Key Stage 4 can be made:

- Data representation and storage – the use of binary as a foundation to store and represent numbers, letters, images and sound.
- The use of hardware and software to control computers – the hardware and software components of a Computer System and the design and implementation of computer programs to solve problems using computational thinking whilst applying both visual and text-based programming techniques. Programming techniques include the use of variables, constants, inputs, outputs, data types, casting and the three basic constructs.
- The use of computers to communicate: network types, network topologies, purpose of hardware, IP and MAC addressing, the Internet and wireless networks.

In addition to the skills above students should have the required knowledge to be responsible digital citizens and are aware of potential vocational opportunities with the ICT industry, this includes knowledge of:

- The benefits, opportunities and transferable skills that Computing can provide.
- The risks and challenges that technology creates today and may pose in future, to both the individual and society, and how these can be mitigated.

In Key Stage 4 the aims are to:

- Further develop and enrich the knowledge that has been established in KS3 to ensure students achieve their potential in the completion of the Computing GCSE or Creative i-Media qualifications.
- Challenge students to solve complex problems through creating sophisticated programs that emulate industry standards.
- Encourage the use of metacognitive skills by students to manage, monitor and reflect upon their own learning.

In Key Stage 5 the aims are to:

- Significantly extend upon the knowledge that has been developed in KS4 to ensure they achieve their potential at A-level.
- Develop the Computing and ICT knowledge needed for further education and a successful future in the workplace.
- Further establish and develop metacognitive skills to encourage greater independence in how progress is monitored and managed.
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Implementation

During KS3 the students have two lessons over a two-week timetable. To enable students to consolidate the Computing knowledge and skills contained within the KS3 curriculum a model is used that spirals over the course of the whole Key Stage. The same topics are revisited in years 8 and then 9 and knowledge and skills are consolidated and then extended upon. The intention is that students have a secure knowledge of the threshold concepts that will provide a good foundation for progress at KS4.

In the majority of lessons there is a retrieval focus, this can combine knowledge that has been acquired both recently and in previous units. In addition to the retrieval focus in lessons all assessments build upon each other so one assessment will not focus on just that topic but also on previous ones. The use of on-line resources supports tasks completed in lessons and knowledge retrieval. These include *Quizlet*, an interactive on-line virtual flashcard system, that is used within all key stages. This allows students to develop a familiarity with tier three terminology. For each different sub-topic, a set of key words has been created that can be accessed and used within the interactive games and challenges that the site contains. At KS4 and KS5 additional platforms such as *Seneca*, *Isaac* and the *craigndave* website are used. These contain many home tutor videos, through their use students are encouraged to adopt a flipped learning approach to new sub topics they are about to learn or to independently revise and further develop their knowledge before and after assessments.

End of topic and exam assessments at all key stages are centered around the student and they are expected to perform an active role in analysing assessments they complete in order to develop a self-awareness of how to improve their knowledge or skills. This is completed through a feedback pro-forma through which students identify which areas they have performed well in and in which further development is required. Once the necessary knowledge and skills for improvement have been acquired questions and tasks on these areas are repeated.

Of equal importance is the necessity for students to be responsible digital learners that are aware of the risks that need to be mitigated when using technology. This is why cyber safety is a topic that is revisited at multiple times during the academic year. A lesson that focuses on cyber safety is taught at the beginning of each term in addition to activities as a whole school that revolve around the celebration of Safer Internet Day each February. This is consolidated by students completing Cyber Safety tasks using the Inspiring Digital Enterprise Award (iDEA) and Cyber Explorer websites, on-line programmes that help young people to develop digital, enterprise and employability skills.

Literacy within Computer Science and ICT as a discipline

The goal of using literacy skills in Computing is to foster a deeper conceptual understanding of the subject. The specific literacy demands placed upon students in Computer Science and ICT include:

- Specificity and abstractness of Computer Science vocabulary and acronyms not seen regularly in other subjects (e.g. ASCII, topology, defragmentation, lossy)
- Atypical meanings for more common words (e.g. function, procedure, accumulator, driver, register)
- Understanding of command words when responding to open questions
- Significant variety of related Computing terms and acronyms

In order to ensure students are equipped with the specific disciplinary literacy knowledge pertinent to Computing, the implementation of the intended curriculum ensures teachers of Computing have a shared pedagogy. Here, key definitions are routinely embedded into lessons, command words are explicitly discussed and deconstructed for understanding, with the frequency of open-ended questions and encouragement of tier 2 & 3 vocabulary used.

Year	Curriculum Title	HT1 topics	HT2 topics	HT3 topics	HT4 topics	HT5 topics	HT6 topics
7	Year 7 Computer Science	<p>Introduction to the school network and Cyber Safety - password security.</p> <p>7.1 - Data Representation.</p> <p>Retrieval focus: Data Representation.</p>	<p>7.1 - Finish Data Representation unit.</p> <p>7.1 - Revise and assess the Data Representation unit and provide feedback.</p> <p>7.2 - Components of a Computer System unit.</p> <p>Retrieval focus: Data Representation, Components of a Computer System.</p>	<p>Cyber safety - introduce and establish the iDEA vocational course.</p> <p>7.2 - Finish Components of a Computer System unit.</p> <p>7.2 - Revise and assess Components of a Computer System unit and provide feedback.</p> <p>Retrieval focus: Data Representation, Components of a Computer System.</p>	<p>iDEA vocational course.</p> <p>7.3 Programming unit (Scratch).</p> <p>Retrieval focus: Data Representation, Components of a Computer System, Programming.</p>	<p>Cyber Safety - personal data.</p> <p>7.3 - completion of Visual Programming unit (Scratch).</p> <p>7.3 - Revise and assess Visual Programming unit (Scratch) and provide feedback.</p> <p>7.4 – Textual programming unit (Python).</p> <p>Retrieval focus: Data Representation, Components of a Computer System, Programming.</p>	<p>7.4 - Complete Textual Programming unit (Python).</p> <p>7.4 - Revise and assess Textual Programming unit (Python) and provide feedback.</p> <p>7.5/7.6 - Networks unit completed in part as a creative project. HTML used to create web pages.</p> <p>Retrieval focus: Programming, Networks.</p>
8	Year 8 Computer Science	<p>Reintroduction to the school network and Cyber Safety - password security.</p> <p>8.1 - Data Representation.</p> <p>Retrieval focus: Data Representation.</p>	<p>8.1 - Assess Data Representation unit and provide feedback.</p> <p>8.2 - Components of a Computer System unit</p> <p>Retrieval focus: Data Representation, Components of a Computer System.</p>	<p>Cyber safety - introduce and establish the iDEA vocational course.</p> <p>Finish 8.2 - Components of a Computer System unit.</p> <p>8.2- Revise and assess Components of a Computer System unit and provide feedback.</p>	<p>iDEA vocational course.</p> <p>8.3 Visual Programming unit (Scratch).</p> <p>Retrieval focus: Data Representation, Components of a Computer System, Programming.</p>	<p>Cyber safety - personal data.</p> <p>8.3 - completion of Visual Programming unit (Scratch).</p> <p>8.3 - Revise and assess Visual Programming unit (Scratch) and provide feedback.</p>	<p>8.4 - Complete Textual Programming unit (Python).</p> <p>8.4 - Revise and assess Textual Programming unit (Python) and provide feedback.</p> <p>8.5/8.6 - Networks unit completed as part of a creative</p>

				Retrieval focus: Data Representation, Components of a Computer System.		8.4 – Textual programming unit (Python). Retrieval focus: Data Representation, Components of a Computer System, Programming.	project using vector graphics. Retrieval focus: Programming, Networks.
9	Year 9 Computer Science	Reintroduction to the school network and Cyber Safety - password security. 9.1 - Data Representation. Retrieval focus: Data Representation.	9.1 - Assess Data Representation unit and provide feedback. 9.2 - Components of a Computer System unit. Retrieval focus: Data Representation, Components of a Computer System.	Cyber safety - introduce and establish the iDEA vocational course. Finish 9.2 - Components of a Computer System unit. 9.2 - Revise and assess Components of a Computer System unit and provide feedback. Retrieval focus: Data Representation, Components of a Computer System.	iDEA vocational course. 9.3 Visual Programming unit (Scratch). Retrieval focus: Data Representation, Components of a Computer System, Programming.	Cyber safety - personal data. 9.3 - completion of Visual Programming unit (Scratch). 9.3 - Revise and assess Visual Programming unit (Scratch) and provide feedback. 9.4 - Textual programming unit (Python). Retrieval focus: Data Representation, Components of a Computer System, Programming.	9.4 - Complete Textual Programming unit (Python). 9.4 - Revise and assess Textual Programming unit (Python) and provide feedback. 9.5/9.6 - Networks unit completed as part of a creative using animation. Retrieval focus: Programming, Networks.
10	Year 10 Computer Science	1.1.1 - System architecture including Computer Systems and the CPU. 1.1.2 - CPU Performance.	1.2.1 - Primary storage. 1.2.2 - Secondary storage. 1.2.3 - Units of storage. Key terminology – terms 16-37.	1.2.4 - Data storage. Python T.I.M.E - Objective 02, Selection workbook.	1.2.5 – Compression. 1.5.1 - Operating systems. 1.5.2 - Utility software.	1.3.1 - Networks and topologies. 1.3.2 - Wired and wireless networks, protocols and layers. 1.6.1 - Ethical, legal, cultural and	1.4 - Network security. 1.6.1 - Ethical, legal, cultural and environmental impact.

		<p>1.1.3 - Embedded Systems.</p> <p>Python T.I.M.E - Objective 01 Structured Programs workbook.</p> <p>Key terminology – terms 1-15.</p> <p>Retrieval focus: Quizlet, Key terminology – terms 1-15.</p> <p>1.1.1 - System architecture including Computer Systems and the CPU.</p> <p>1.1.2 - CPU Performance.</p>	<p>Retrieval focus: Quizlet, Key terminology – terms 1-37.</p> <p>Python T.I.M.E - Objective 01 Structured Programs workbook.</p> <p>1.1.1 - System architecture including Computer Systems and the CPU.</p> <p>1.1.2 - CPU Performance.</p>	<p>Key terminology – terms 38-57.</p> <p>Retrieval focus: Quizlet, Key terminology – terms 1-57.</p> <p>1.2.1 - Primary storage.</p> <p>1.2.2 - Secondary storage.</p> <p>Python T.I.M.E - Objective 01, Learning how to write structured programs workbook.</p>	<p>Key terminology – terms 58-60, 110-122.</p> <p>Retrieval focus: Python T.I.M.E - Objective 01 and Objective 02.</p>	<p>environmental impact.</p> <p>Key terminology – terms 61-96.</p> <p>Retrieval focus: Key terminology – terms 1-60, 110-122.</p> <p>Python T.I.M.E - Objective 01 and Objective 02.</p> <p>Revise for mocks - component 1 content.</p>	<p>Python T.I.M.E - Objective 03/04 numbers and data types workbook.</p> <p>Retrieval focus: 1.3.1 Networks and topologies.</p> <p>1.3.2 - Wired and wireless networks, protocols and layers.</p>
10	Year 10 OCR Nationals Creative iMedia Yr10	<p>R081 - Pre-Production Documents.</p> <p>L01 – understanding the purpose of pre-</p>	<p>R081 -Pre-Production Documents.</p> <p>LO2 – Theory on planning pre-production including workplans/legislation, health & safety and</p>	<p>R081 -Pre-Production Documents Revision and Exam 10th January 2022.</p> <p>R082- Creating a Digital Graphic –</p>	<p>R082- Creating a Digital Graphic LO1 – Identifying the purpose of digital graphics.</p> <p>2 hour assessed lessons on LO1.</p>	<p>R082- Creating a Digital Graphic LO3 – Creating a digital Graphic 3hour assessed lessons on LO3.</p>	<p>R082- Creating a Digital Graphic LO4 – Identifying the purpose of digital graphics 2 hour assessed lessons on LO4.</p>

		<p>production documents.</p> <p>(Mood boards, Storyboards, Visualisation documents, scripts).</p> <p>LO2 – Theory on planning pre-production including Client requirements, target audience and research.</p>	<p>hardware/software requirements.</p> <p>LO3 – creating examples of the above pre-production documents.</p> <p>LO4 – reviewing pre-production documents.</p> <p>Exam Revision and question practice for R081 Exam.</p>	<p>Photopea/ Fireworks Photoshop software skills.</p> <p>R082- Creating a Digital Graphic LO1 – Identifying the purpose of digital graphics.</p>	<p>R082- Creating a Digital Graphic LO2 – Planning to create a digital graphic.</p> <p>3 hour assessed lessons on LO2.</p> <p>R082- Creating a Digital Graphic – Photopea/fireworks Photoshop software skills.</p>	<p>Exam Revision and question practice for R081 Students who are resitting exam.</p> <p>Pre-Production Documents revision (LO1 – LO4).</p>	<p>R085- Creating a multipage website.</p> <p>LO1: Understand the properties and features of multipage websites: Reviewing existing websites, provide description of how to access internet and devices that can connect to the internet.</p> <p>Work shop tutorials on Rocket cake /dreamweaver Photopea/ Fireworks Photoshop software skills.</p>
11	Year 11 Computer Science	<p>2.2 - Programming fundamentals.</p> <p>Retrieval focus:</p> <p>1.1.1 - System architecture including Computer Systems and the CPU.</p> <p>1.1.2 - CPU Performance.</p>	<p>2.2 - Programming fundamentals.</p> <p>Retrieval focus:</p> <p>1.2.1 - Primary storage.</p> <p>1.2.2 - Secondary storage.</p> <p>1.2.3 - Units of storage.</p>	<p>1.2.3 - Units.</p> <p>1.2.4 - Data storage.</p> <p>2.4.1 - Boolean logic.</p> <p>Retrieval focus:</p> <p>2.2 - Programming fundamentals.</p>	<p>Algorithms and Computational Thinking.</p> <p>Retrieval focus:</p> <p>2.2 - Programming fundamentals.</p>	<p>Revision.</p>	

11	Year 11 OCR Nationals Creative i-Media	<p>R085 LO1: Understand the properties and features of multipage websites: Provide description of how to access internet and devices that can connect to the internet</p> <p>R081: Exam revision. Practice paper and mock exam.</p> <p>L02: Be able to plan a multipage website Client Brief, Target audience, Work plan/ Gantt chart/Visualisation diagrams/Site map, house style.</p>	<p>L02: Be able to plan a multipage website. Asset collection/ test plan, Legislation.</p> <p>Learning Outcome 3: Be able to create multipage websites using multimedia components Saving assets, creating master pages. Create a navigation system</p> <p>L03: Building the website Three hours to complete this build – ensure that the pupils use the visualisation diagram from LO2 to complete this.</p> <p>L04: Be able to review a multipage website</p>	<p>R082- Creating a Digital Graphic – Photopea/ Fireworks Photoshop software skills. R082- Creating a Digital Graphic LO1 – Identifying the purpose of digital graphics.</p> <p>R082- Creating a Digital Graphic LO1 – Identifying the purpose of digital graphics 2 hour assessed lessons on LO1.</p> <p>R082- Creating a Digital Graphic LO2 – Planning to create a digital graphic.</p> <p>3 hour assessed lessons on LO2.</p>	<p>R082- Creating a Digital Graphic LO3 – Creating a digital Graphic 3hour assessed lessons on LO3. R082- Creating a Digital Graphic LO4 – Identifying the purpose of digital graphics 2 hour assessed lessons on LO4</p>	Completion of any outstanding work, improvements needed.	
12	A Level Computer Science	<p>1.1.1 Structure and function of the processor</p> <p>1.1.2 Types of processor</p> <p>2.2.1 Programming Techniques</p>	<p>1.1.3 Input, output, storage devices, Memory</p> <p>1.2.1 System Software</p> <p>2.2.1 Programming Techniques (Python TIME 01 - Selection)</p> <p>Retrieval focus:</p>	<p>1.2.1 System Software</p> <p>1.2.2 Applications Generation</p> <p>2.2.1 Programming Techniques (Python TIME 01 - Selection)</p>	<p>1.2.3 Software Development</p> <p>3.3.1 Developing the solution – Defold/Unity skill development</p> <p>Retrieval focus:</p>	<p>1.3.1 Compression, Encryption and Hashing</p> <p>1.3.2 Databases</p> <p>1.3.3 Networks</p>	<p>1.3.4 Web Technologies</p> <p>1.4.1 Data Types</p> <p>1.4.2 Data Structures</p> <p>1.4.3 Boolean Algebra</p>

		(Python TIME 01 - Subroutines)	<p>1.1.1 Structure and function of the processor</p> <p>1.1.2 Types of processor</p> <p>2.2.1 Programming Techniques (Python TIME 01 - Subroutines)</p>	<p>3.3 Developing the solution – Defold/Unity skill development</p> <p>Retrieval focus: 1.1.1 Structure and function of the processor</p> <p>1.1.2 Types of processor</p> <p>2.2.1 Programming Techniques (Python TIME 01 - Subroutines)</p>	<p>1.2.2 Applications Generation</p> <p>1.1.2 Types of processor</p> <p>2.2.1 Programming Techniques (Python TIME 01 - Subroutines)</p> <p>2.2.1 Programming Techniques (Python TIME 01 - Selection)</p>	<p>1.5.1 The Copyright Design and Patents Act 1988 (c)</p> <p>3.3.1 Developing the solution – Defold/Unity skill development</p> <p>Python - Objective 03 Learn how to use number data types workbook</p> <p>Python - Objective 04 Learn how to use string data types workbook</p> <p>Revision for mock</p> <p>Retrieval focus: 1.1.1 Structure and function of the processor</p> <p>1.1.2 Types of processor</p> <p>1.2.2 Applications Generation</p> <p>2.2.1 Programming Techniques (Python TIME 01 - Selection)</p>	<p>1.5.1 T</p> <p>The Regulation of Investigatory Powers Act 2000 (d)</p> <p>3.3 Developing the solution – Defold/Unity skill development</p> <p>Python - Objective 05 Learn how to use counter-controlled iterations workbook</p> <p>Python - Objective 06 Learn how to use condition-controlled iterations workbook</p> <p>Retrieval focus: 1.3.1 Compression, Encryption and Hashing</p> <p>1.3.2 Databases</p> <p>1.3.3 Networks</p> <p>Python T.I.M.E - Objective 03/04 Learn how to use</p>
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