HGS Curriculum Map Key Stage 4

Year Group: 11 Computer Science GCSE - Spring

Time period	Spring 1	Spring 2
Topics/ sub-topics	**Data Representation**	**Revision Techniques & Exam Practice**
Purpose	This is a theoretical unit covering Section 2.6 of the OCR Computer Science specification. It begins with the conversion of integers from denary to binary, simple binary addition, overflow and shifts. Check digits, the use of hexadecimal numbers and the binary representation of characters are also covered. Representation of images and sound, and compression techniques are covered in the final three lessons.	The focus of this final half-term is revision and exam preparation. Guided by data, from previous summative assessments, 'tricky' topics will be interleaved into a coherent revision plan. Students will have multiple opportunities to complete past papers and receive feedback.
Crucial Learning	**At the end of this Unit all students should be able to:** • Explain why all data needs to be converted to binary before the computer can process it • Convert positive denary whole numbers (0-255) into 8-bit binary numbers and vice versa • Convert between binary and hexadecimal • Explain the use of binary codes to represent characters • Understand the term 'character set' • Explain the relationship between the number of bits per character and the number of characters which can be represented • Explain the representation of an image as a series of pixels represented in binary • Explain how sound can be sampled and stored in digital form • Perform a binary shift • Explain the need for compression **Most students will be able to:** • Add two binary integers and explain overflow errors • Explain why hexadecimal numbers are used to represent binary data • Discuss the effect of colour depth and resolution on the size of an image file • Explain how sampling intervals and other considerations affect the size of a sound file • Explain the effects of a binary shift • Explain the purpose of a check digit • Explain the effect of different types of compression	**At the end of this Unit all students should be able to:** • Understand how to revise effectively • Produce a realistic revision plan • Vary their revision with a variety of different activities • Be familiar with the exam-board specification and identify areas of weakness • Analyse past exam questions and mark schemes to gain an understanding of assessment expectations • Reflect on teacher feedback and act upon it • Be aware and practise good exam techniques

	Some students will be able to: • Explain how instructions are coded as bit patterns • Explain how sampling intervals affect quality of the playback of a sound file • Explain how the computer distinguishes between instructions and data • Calculate a check digit		
Sequence	**Prior Knowledge** • In the Y7 module 'How Computers Work', pupils are taught simple binary concepts. Additional time may need to be spent on recapping how to convert between denary and binary if they are not confident.	**Prior Knowledge** • N/A	
	Future Learning: A-Level Computer Science (AQA): - 4.5 Fundamentals of data representation	**Future Learning:** • N/A	
Skills Acquired	**Computational Thinking Skills:** • Decomposition - breaking down complex problem or system into smaller, more manageable parts • Pattern recognition - looking for similarities among and within problems • Abstraction - focusing on the important information only, ignoring irrelevant detail • Algorithms - developing a step-by-step solution to the problem, or the rules to follow to solve the problem	**Exam Techniques:** • Read through the paper • Plan your time • Think like an examiner • Write in short sentences • Answer the question, not everything you know! • Avoid the obvious mistakes • Final checks	

Assessment:	Assessment	Assessment

Formative & summative	**Verbal Feedback**: Regular use of peer, self and teacher feedback
	
	Written Feedback: Individual feedback of home learning assessments in the Showbie 'Marking and Feedback' folder. Students have dedicated improvement and reflection time at the start of each lesson.
	
	Learning Grids:
	   - 2.6 Data Representation
	
	Topic Tests:
	   - 2.5 Data Representation
	
	SIMS:
	   - SPR 1 OGCU
		Verbal Feedback: Regular use of peer, self and teacher feedback
		
		Written Feedback: Individual feedback of home learning assessments in the Showbie 'Marking and Feedback' folder. Students have dedicated improvement and reflection time at the start of each lesson.
		
		Practise Papers:
		   - Paper 1: QP1, QP2, QP3, QP4
		   - Paper 2: QP1, QP2, QP3, QP4
		
		Past Papers:
		   - Paper 1: Sample Paper, Practise Paper, June 18, June 19
		   - Paper 2: Sample Paper, Practise Paper, June 18, June 19
		
		SIMS:
		   - SPR 2 OGCU