Computer Science	8: S1 – Understanding Computers How Does a Computer Think?		Summer Term
Learning outcomes	In this unit students will learn how data is stored in a computer. They will develop the skills needed to convert what we understand as humans into the language that computers understand.		
Key Question	How does the physical technology determine how we store data in a computer and how do we use these values to represent everything that a computer can do?		
Knowledge	Key Concepts: • Knowledge and understanding of how computers came into existence. • Why do computers use binary? • How do we measure units of memory? • What can we do with binary to store information in a computer (numbers, text, images) Key Skills: • Conversion between decimal and binary numbers • Conversion between binary, decimal and hexadecimal numbers • Use appropriate memory unit prefixes • Binary addition up to two digits • Binary shifts • Use of ASCII • Conversion between simple images and binary	Terminology: • Computer • Bit, Byte • Decimal, Base 10 • Binary, Base 2 • Hexadecimal, Base 16 • Kilo, Mega, Giga, Tera, Peta, Exa • Binary Addition • Overflow • Binary Shift • Character Sets • ASCII, Unicode • Pixel • Image Resolution • Colour Depth • File Size • Metadata	
Ongoing Assessment	Student progress will be monitored throughout the exercises. Some exercises will be completing documents provided via MS Teams as live assignments (They can be edited directly on Teams), some will be practice-based exercises. Answers are expected to be in the student's own words and not paraphrased or directly copied from online resources.		

	Students will have access to the resources used via SharePoint/Teams and will be expected to continue with the work for 30 minutes outside of class. The work will check understanding of the key concepts, particularly logical order of terminology such as memory unit prefixes and which way binary codes are read and converted.
Key Assessment	This unit is seven lessons long with a 40 -minute paper-based written test in the final lesson. It is a common assessment that the whole year group will be taking. The assessment has different levels of understanding and grasp of the skills. These sections are focused on knowledge (multiple choice questions), Skills and Application (short answer questions) and understanding (long answers with context). The gradings will be calculated once all results are in. The gradings follow the report ratios: | Percentage of students	Number of students (out of 210)	Grading colour
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Top 5-10%	10 - 21	Purple
Higher 20-30%	42-63	Blue
Middle 45-50%	94-105	Green
Lower 8-12%	16-25	Yellow
Lowest 3-6%	6-12	Orange	 The assessment marks are combined with other unit grades to form each student's Best Fit grade in report seasons.
Clear sequencing of content	Binary • From hardware to software • Counting in binary • Memory unit prefixes (builds on their experiences of their own devices) • Binary addition and shifts Further application of Binary for storing data and making a computer think • Text representation: ASCII vs Unicode which also leads into Hexadecimal • Image storage Unit leads into 9S1 and into GCSE Unit 3 – Data Representation
Links to Careers	Digital Forensics, Graphics Designers, Software Developers, Teachers, Photographers, Social Media Editors
Diversity and Inclusion	Different languages and alphabets discussed as part of Text representation.

Support	Step by step instructions, videos, PowerPoints. Knowledge organisers created as they go online. SharePoint pages with videos and lesson materials Weekly drop-in lunchtime peer mentor help sessions – please ask your teacher for more information. We have a set of Year 9 mentors who volunteer to help students out. They have either been through the unit previously themselves or have been brought up to date to be able to help explain and demonstrate the unit content. For those who only attain Orange in the end of unit assessment will be given the opportunity to receive peer mentoring for 3 weeks with a focus on going over their weak areas. In the fourth week they will take a shorter 20-minute assessment. Their percentage on this will update their end of unit grade and be taken forward into their report grade.
Challenge Wider reading / research / super curricular activities	Coding Club, CyberClub blog.Unicode.org