

Autumn 2023

Subject: Computer Science

Year: 11

Topic(s) to be covered

Data Representation

In this unit allows learners to gain the understanding and skills required for the data representation sections of the GCSE computer science exam. First, learners look at binary and hexadecimal numbering systems, how they work, and how to convert between bases. Then, learners explore different coding systems and find out how text, images, and sound are represented in computers.

Aim of the unit

- Define the terms nibble, terabyte and petabyte
- Convert positive denary whole numbers (0-255) into 8-bit binary numbers and vice versa
- Convert positive denary whole numbers (0-255) into 2-digit hexadecimal numbers and vice versa
- Add two 8-bit binary integers and explain overflow errors which may occur
- Understand the use of binary shifts
- Understand the use of binary codes to represent characters
- Understand the term 'character set'
- Explain the relationship between the number of bits per character in a character set, and the number of characters that can be represented using:
 1. ASCII
 2. Extended ASCII
 3. Unicode
- Explain the need for image metadata
- Explain the relationship between file size and image resolution
- Be able to represent a short sound file in binary
- Explain the trade-off between file size and the quality of playback

A detailed breakdown of what will be covered in each lesson can be found on the class Teams page.

Assessment Procedures

Each lesson contains tasks for students to work through independently and as whole class that cover the topics for that lesson, solutions will be shared and approaches to tackling problems will be modelled

At the end of this unit, students will be given a 1 hour test to solve some of the theoretical aspects . This will be done under exam conditions and will determine their final grade for this unit.

Homework guidance

Homework will be set via a Seneca to reinforce that material covered in lessons The test scores will be recorded and progressed monitored of time spent and completion rates.

How can you help?

Encourage your child to use revision guide to constantly reinforce the learning taking place and visit Seneca .
Students will also be provide with a range a material on the teams to help support and supplement their learning.