Beckfoot

Subject: Computer Science	Topic: Data Representation	Year Group: 10

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Number Bases and Binary addition

1. Decimal - Base 10
2. Binary - Base 2
3. Hexadecimal - Base 16

- Converting from binary to denary.
- Converting from denary to binary.
- Converting between hex and denary.
- Converting between hex and binary.

- Adding binary numbers.
- Overflow.

Binary Addition

- 0 + 0 = 0
- 1 + 0 = 1
- 0 + 1 = 1
- 1 + 1 = 10
- 1 + 1 + 1 = 11

Units of Information

(1000)	(1024)
Bit	Bit
Nibble	Nibble
Byte	Byte
Kilobyte	Kibibyte
Megabyte	Mebibyte
Gigabyte	Gibibyte
Terabyte	Tebibyte

Data Compression

- What is data compression?
- Need for compression
- Types of compression
  - Lossy (example: image file)
  - Lossless (example: text file)
- Huffman Tree Coding
- Run Length Encoding (RLE)

Images and Sound

Images

Image files are stored in binary on a computer.

- Metadata
- Pixel
- Colour depth
- Resolution
- Bitmap images
- Vector images

Sound

- - Sample rate
  - Quality of sound
  - File size
- Sample resolution: is the number of bits per sample
- Calculate file sizes:
  - File size (bits) = rate x res x secs

Key Vocabulary

1	Binary	The computers language. A counting system which uses 1s and 0s, also known as machine code.
2	Character Set	A group of characters that a computer recognizes from their binary representation.
3	Decimal	A digit represented in base ten
4	Hexadecimal	A digit represented in base 16

Hex	Decimal
A	10
B	11
C	12
D	13
E	14
F	15