Year 8 – Autumn Term 2: Data Representation

Key Vocabulary…

Name	Purpose
Computational Thinking	Designing and planning out a solution in an organised way.
Abstraction	Removing all of the unnecessary information from a problem to make it easier to solve.
Decomposition	Breaking a difficult problem down into easy to manage steps.
Bit	A binary unit – 0 or 1.
Binary	A 2 digit number system used by computers which uses the digits 0 and 1.
Denary	A 10 digit number system used by humans which uses the digits 0,1,2,3,4,5,6,7,8,9.
Hexadecimal	A 16 digit number system used by humans which uses the digits 0,1,2,3,4,5,6,7,8,9 and the letters A, B, C, D, E, F
Overflow error	An error when the computer tries put a bigger number in a smaller number of bits.
Character	A single letter, number or a punctuation such as !, ? .
Character set	A group of characters such as ASCII, extended ASCII and Unicode.

Picture This…

Converting a Hexadecimal number to a denary number. 0x56

Step 1: Place the hex number above the nibbles.

5 6

8	4	2	1		8	4	2	1
0	1	0	1		0	1	1	0

Step 2: Put the nibbles together to make a byte.

128	64	32	16	8	4	2	1
0	1	0	1	0	1	1	0

Step 3: Add the placeholder values up where there is a 1.

64+ 16 +4 +2 =**86**

Always Remember…

Binary	Hex	Decimal
0000	0	0
0001	1	1
0010	2	2
0011	3	3
0100	4	4
0101	5	5
0110	6	6
0111	7	7
1000	8	8
1001	9	9
1010	A	10
1011	B	11
1100	C	12
1101	D	13
1110	E	14
1111	F	15

Use this table to help with your conversions.

Questions

1. Which number system is used by a computer. Explain why this is?
2. What is it called when a computer tries to put a bigger number into a smaller space?
3. What is it called when you break a problem down into smaller steps?
4. Why do we use hexadecimal numbers?
5. Convert the following hex numbers to binary. 0c56, 0x7e, 0x6d, 0x3e, 0xA9, 0xBB, 0xCF, 0xFF
6. Convert the following hex numbers to denary. 0xe3, 0xd4, 0xe2,0xfd,0x2d

Deeper Learning…

Char	Binary	Hex	Denary
B	01000010	42	66
b	01100010	62	98
3	00110011	33	51

Activity – Write out your name in using binary code, then convert that code to Hex.