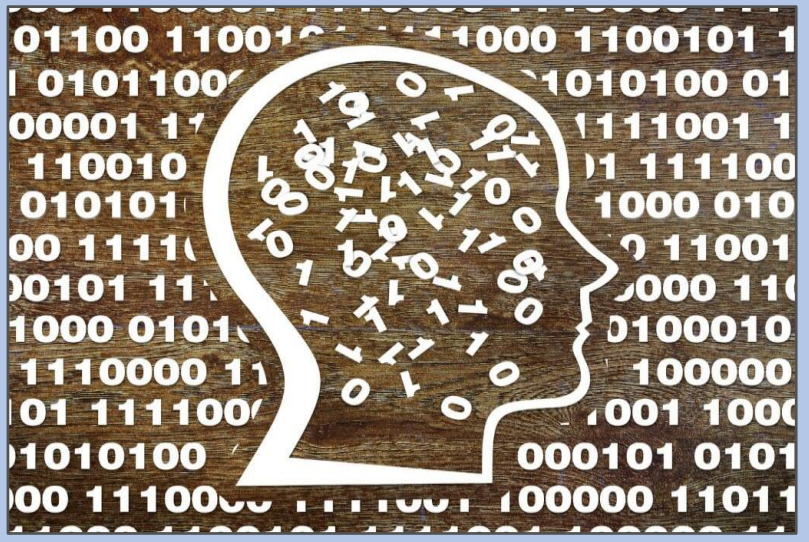
Year 8 Topic 6 – Representations: from clay to silicon

Lesson	Can you?
1 Across time and space	List examples of representations Recall that representations are used to store, communicate, and process information Provide examples of how different representations are appropriate for different tasks
2 Lights and drums	Recall that characters can be represented as sequences of symbols and list examples of character coding schemes Measure the length of a representation as the number of symbols that it contains Provide examples of how symbols are carried on physical media
3 Binary digits	Explain what binary digits (bits) are, in terms of familiar symbols such as digits or letters Measure the size or length of a sequence of bits as the number of binary digits that it contains
4 Numbers in binary	Describe how natural numbers are represented as sequences of binary digits Convert a decimal number to binary and vice versa
5 Large quantities	Convert between different units and multiples of representation size Provide examples of the different ways that binary digits are physically represented in digital devices
6 Turing's mug	Apply all the skills covered in this unit

Useful websites

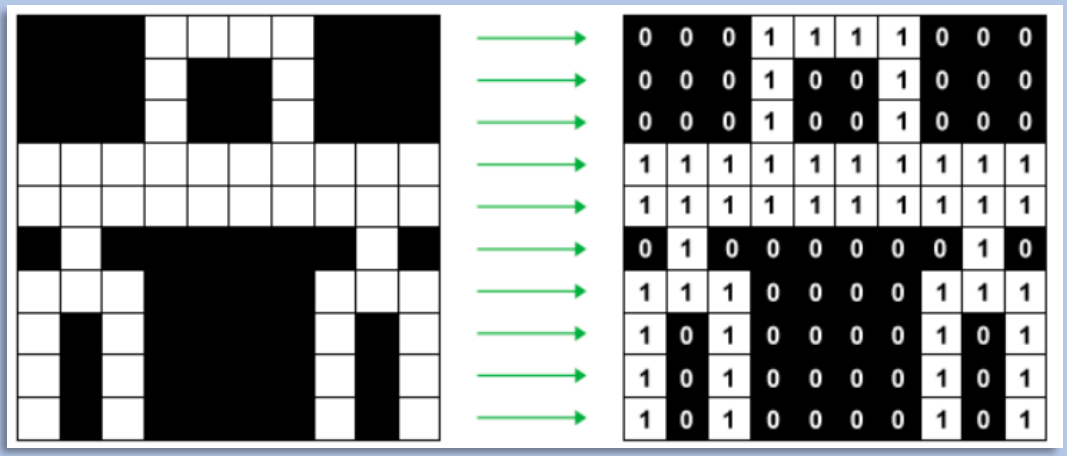
- www.scratch.mit.edu
- www.en.wikipedia.org
- www.teachinglondoncomputing.org/lego-braille
- www.csunplugged.org/en
- www.csfieldguide.org.nz/en
- www.archive.org/details/advancementofl00baco/page/256
- www.curriculum.code.org
- www.cs4fn.org
- www.denninginstitute.com/pjd/GP/GP-site/welcome.html
- www.futurelearn.com/courses/how-computers-work



KNOWLEDGE ORGANISER
Key Stage 3 - COMPUTING

Binary Value	Decimal Representation	Decimal Value
	8 4 2 1	
0 0 0 0	0 + 0 + 0 + 0	0
0 0 0 1	0 + 0 + 0 + 1	1
0 0 1 0	0 + 0 + 2 + 0	2
0 0 1 1	0 + 0 + 2 + 1	3
0 1 0 0	0 + 4 + 0 + 0	4
0 1 0 1	0 + 4 + 0 + 1	5
0 1 1 0	0 + 4 + 2 + 0	6
0 1 1 1	0 + 4 + 2 + 1	7
1 0 0 0	8 + 0 + 0 + 0	8
1 0 0 1	8 + 0 + 0 + 1	9
1 0 1 0	8 + 0 + 2 + 0	10

Binary is a number system that only uses two digits: 1 and 0. All information that is processed by a computer is in the form of a sequence of 1s and 0s. Therefore, all data that we want a computer to process needs to be converted into binary.



Computer manufacturers agreed to use one code called the ASCII (American Standard Code for Information Interchange). ASCII is an 8-bit code. That is, it uses eight bits to represent **a letter or a punctuation mark**.

Dec	Binary	Char	Dec	Binary	Char	Dec	Binary
033	00100001	A	065	01000001	a	097	01100001
034	00100010	B	066	01000010	b	098	01100010
035	00100011	C	067	01000011	c	099	01100011