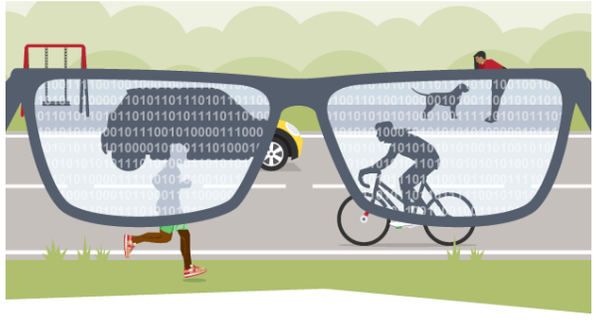
Computing Department Knowledge Organiser: Year 8 Binary

Binary

What is Binary?

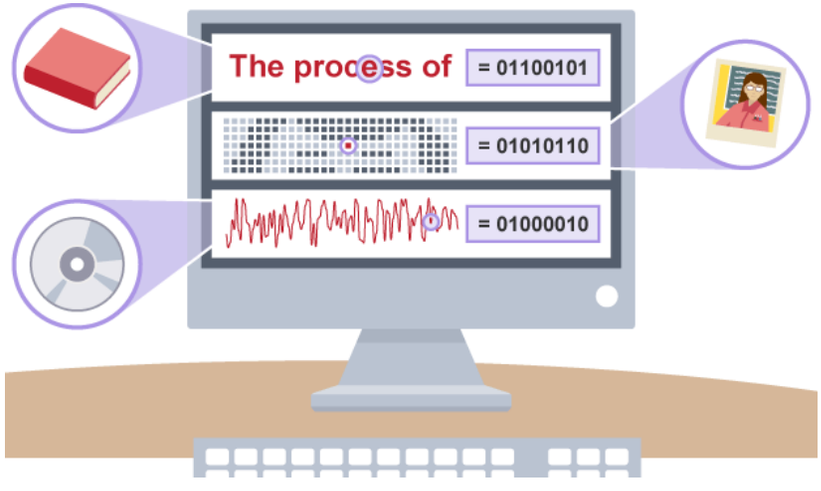


Binary is a number system that only uses two digits: 1 and 0.

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.

How computers see the world



There are a number of very common needs for a computer, including the need to store and view data.

Computers use electrical signals that are **ON** or **OFF**, so they have to see everything as a series of binary numbers.

This data is represented as a sequence of 1s and 0s (ON and OFF).

All data that we want a computer to process needs to be converted into this binary format.

Base 2 System:

1 and 0

The binary system is known as a ‘base 2’ system because:

- there are only two digits to select from (1 and 0)
- when using the binary system, data is converted using the power of two

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Task 1 Converting denary (our numbers) to binary	
Using the binary place values in the table, can you work out what these numbers are in binary? • 2 • 30 • 102 • 168 • 255	How to work out 168 in binary. Remember, you can only enter 1 and 0: • We know that 128 + 32 + 8 = 168 • Put a 1 in each of these columns in the table above • Put a 0 in any blank columns The answer in binary is: **10101000**

Binary Place Values

128	64	32	16	8	4	2	1

Task 2 Binary numbers max and min	
What is the maximum number that you can make with 8 bit binary? How is it written in binary?	What is the minimum number that you can make with 8 bit binary? How is it written in binary?

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Task 3 Messages in Binary

a	1100001	n	1101110
b	1100010	o	1101110
c	1100011	p	1110000
d	1100100	q	1110001
e	1100101	r	1110010
f	1100110	s	1110011
g	1100111	t	1110100
h	1101000	u	1110101
i	1101001	v	1110110
j	1101010	w	1110111
k	1101011	x	1111000
l	1101100	y	1111001
m	1101101	z	1111010

This table shows what letters look like in binary. In your home learning book, write your name in binary code.

E.g. Bob = b 1100010
o 1101110
b 1100010

Write a longer message in binary code instead of using letters.