



Binary code challenge

Teacher sheet

Please read this sheet before setting the challenge for the pupils as some of this information is not to be shared with them but is for your knowledge only.

Computers and electrical devices store and communicate digital information as binary code.

Bits and Bytes:

The zero or one is called a **bit** and is the smallest unit of digital storage.

Eight **bits** make one **byte**

A **byte** stores data for one character, for example, A, !, @, 8 or).

The colours red, green and blue for a pixel are also stored in groups of bytes called triplets.

This means that pupils can be taught that binary storage of information leads to the ability to input and store text and image information on a computer device. Computers process millions of bytes per second which means that sending and storing text information is very simple and data light.

The challenge:

To work out how binary code works as a value. Using only zero and one, place these digits in the correct position to represent values from 1-26.

Things to know:

Binary code is recorded and read from right to left.

The digit zero represents the value of a place being off.

The digit one represents the value of a place being on.

The value of each place doubles beginning at one.

Value of position	32	16	8	4	2	1
Status	Off	Off	Off	On	Off	On
Binary	0	0	0	1	0	1

The value of the binary code above (000101) is 5 because the 4 and 1 positions are turned on. Which equal a total of 5. To count in binary, 000000 equals zero and is the starting point.

The worksheet example uses only five column spaces for five **bits** but it is worth mentioning that eight **bits** equals one **byte**.

Storage:

Size	Name
0 or 1 =	Bit
8 bits =	Byte
Approx 1000 bytes =	Kilobyte (KB)
Approx 1000 kilobytes =	Megabyte (MB)
Approx 1000 Megabyte =	Gigabyte (GB)
Approx 1000 gigabytes =	Terabyte (TB)