

Low Level Machine

How can numbers, letters, pictures etc represented in the computer?

- ✓ The computer is a 2 state device, only using the binary values 1 and 0.
- ✓ All text, numbers etc. must be changed to this state before the computer can work with them.

How do bits, bytes, kilobytes, megabtes, gigabytes and terabytes work?

- ✓ A bit (binary digit) is either a 1 or a 0.
- ✓ No character such as a letter or number can be represented in just one bit.
- ✓ A byte is a series of 8 bits.
- ✓ Single characters can be stored using one byte.

How do bits, bytes, kilobytes, megabtes, gigabytes and terabytes work?

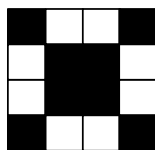
- ✓ A kilobyte is 2^{10} bytes = 1024 bytes
- ✓ A megabyte is 2^{10} kilobytes = 1024 kilobytes
- ✓ A gigabyte is 2^{10} megabytes = 1024 megabytes
- ✓ A terabyte is 2^{10} gigabytes = 1024 gigabytes
- ✓ Therefore, a gigabyte = $1024 * 1024 * 1024 * 1024 * 8 = 879609302016$ bits.

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How are graphics stored in the computer?

Computer screen is made up of many pixels, with the value 0 or 1.
This basically translates to 1 or 0 for black and white.

A simple graphical representation is shown.



1	0	0	1
0	1	1	0
0	1	1	0
1	0	0	1

- ✓ This screen would have 16 bits (2 bytes).
- ✓ 2 bytes would store any picture on this screen, but the range and quality of picture is very limited.

What is MACHINE CODE?

The computer's own language, containing only 1's and 0's.

What is a HIGH LEVEL LANGUAGE?

- ✓ Programming languages written in everyday language like English, with instructions telling the computer what to do, e.g. PRINT "Hello" in Visual Basic.
- ✓ Errors can be quite easily found and fixed because the language looks like everyday language.