Understanding Computers

Keyword	Definition
Bit	A single binary digit 0 or 1
Byte	8 bits
Decimal	A number system which used Base 10
Binary	A number system which used Base 2
CPU	The Central Processing Unit
RAM	Random Access Memory
ROM	Read Only Memory

Binary representation

One switch can only represent 2 possible states

On or **Off**.

Two switches can represent 4 states

On & On

On & Off

Off & On

Off & Off

Rules of Binary addition

Work Right to Left and apply these simple rules:

1. 0 + 0 = **0**
2. 0 + 1 = **1**
3. 1 + 0 = **1**
4. 1 + 1 = **0** *Carry 1*
5. 1 + 1 + 1 = **1** *Carry 1*

```
        1 1
      1 1 1 0    14
  +   1 1 0 0    12
  = 1 1 0 1 0    26
```

Carry Bit | Rule 5 | Rule 4 | Rule 2 or 3 | Rule 1

How a CD is read

Top of CD ROM Disk

Change — Change — Change

Pit — Land — Land — Pit — Land

Bottom of CD ROM Disk

Reflected Light

Light Sensor

Laser

A change from a Pit to a Land is read as a 1 and no change or a Land is read as a 0

This will read as: **01001010**

Remember Your **ASCII**!

Therefore **01001010** = **74** = Letter **J**

8 Bits = 1 Byte = 1 Character of Text

Input Devices

Keyboard

Mouse

Microphone

Scanner

Web cam

Output Devices

Printer

Monitor

Speakers

Projector

Storage Devices

USB Stick

CD

Hard drive

DVD

Fetch, Execute cycle

Fetch

Decode

Execute

Hardware and Software

Hardware are the items that you can physically touch, all input and output devices are hardware.

Software are the programs running on your computer, you cannot 'touch' software.

Bits and Bytes

0 or 1	= 1 bit (Binary Digit)
8 bits	= 1 Byte
1024 Bytes	= 1 Kilobyte (Kb)
1024 Kb	= 1 Megabyte (Mb)
1024 Mb	= 1 Gigabyte (Gb)
1 Byte	= 1 Character of text

Binary to Decimal conversion

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

= 64 + 16 + 1

= 81

Decimal to Binary conversion

Working right to left write out the numbers 1, 2, 4, 8 and so on doubling each time to 128

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

28 has a 16 in it, leaving 12. 12 is 8 + 4