Computing Memory or Data Storage – A Brief Introduction

When we talk about 'memory' in computing terms what we really mean is data storage. The bigger memory a computer has the more data it can store.

The smallest unit of measurement used for measuring data is a bit. A single bit can have a value of either 0 or 1. It may contain a binary value (such as On/Off or True/False), but nothing more (remember we looked at binary in the previous step of this module). Therefore, a byte, or eight bits, is used as the fundamental unit of measurement for data. A byte can store 2^8 or 256 different values, which is sufficient to represent standard ASCII characters, such as letters, numbers and symbols.

Since most files contain thousands of bytes, file sizes are often measured in kilobytes. Larger files, such as images, videos, and audio files, contain millions of bytes and therefore are measured in megabytes. Modern storage devices can store thousands of these files, which is why storage capacity is typically measured in gigabytes or even terabytes. Larger units of measurement are usually reserved for measuring the sum of multiple storage devices or the capacity of large data storage networks.

Below is a list of all the standard units of measurement used for data storage, from the smallest to the largest.

Unit	Value	Size
bit (b)	0 or 1	1/8 of a byte
byte (B)	8 bits	1 byte
kilobyte (KB)	1000^1 bytes	1,000 bytes
megabyte (MB)	1000^2 bytes	1,000,000 bytes
gigabyte (GB)	1000^3 bytes	1,000,000,000 bytes
terabyte (TB)	1000^4 bytes	1,000,000,000,000 bytes
petabyte (PB)	1000^5 bytes	1,000,000,000,000,000 bytes

exabyte (EB)	1000^6 bytes	1,000,000,000,000,000,000 bytes
zettabyte (ZB)	1000^7 bytes	1,000,000,000,000,000,000,000 bytes
yottabyte (YB)	1000^8 bytes	1,000,000,000,000,000,000,000,000 bytes

NOTE: A lowercase "b" is used as an abbreviation for bits, while an uppercase "B" represents bytes. This is an important distinction, since a byte is 8x as large as a bit.

For example, 100 KB (kilobytes) = 800 Kb (kilobits).

Data storage has grown exponentially over the past few decades. The first hard disk drive, developed by IBM in the 1950s, was the size of a cupboard and could only be lifted by a forklift truck:

And this drive stored just 5MB of data. The average smartphone now holds 16GB of data! It took 51 years to get from the 5MB disk pictured above to one which held 1TB. That was 2007, by 2009 a 2TB disk was available.

Sources:

http://techterms.com/help/data_storage_units_of_measurement

http://royal.pingdom.com/2010/02/18/amazing-facts-and-figures-about-the-evolution-of-hard-disk-drives/