

How Much Text is in a Kilobyte or Megabyte?

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A bit is the most basic unit of information. At their most fundamental level, most modern computers operate on binary bits which means that they can have two states, usually specified as a 0 or 1. Long strings of these bits can be used to represent most types of information including text, pictures and music.

Most modern computers are binary systems and therefore, they are particularly well suited to working with bits. Pure binary information, however, is of little use to humans. The binary number 11000101110 is equivalent to 1582; it is obvious that we are much more suited to working with digits and text instead of ones and zeros.

To help make computers more like our language-based way of thinking, groups of bits are joined into bytes. One byte is comprised of 8 bits. A set of 8 bits was chosen because this provides 256 total possibilities which is sufficient for specifying letters, numbers, spaces, punctuation and other extended characters. This very sentence, for example is composed of 125 bytes because there are 125 letters, digits, spaces and punctuation marks. Keep in mind that we are discussing pure text; some word processing programs, include other sorts of formatting data, and therefore the filesizes will be greater than the number of characters in the file.

It is estimated that a kilobyte can accommodate about 1/2 of a typewritten page. Therefore, one full page requires about 2 kilobytes. The chart below illustrates the number of bytes in common terms such as kilobyte and megabyte and how much text could be stored:

Name	Number of Bytes	Amount of Text
Kilobyte (KB)	2^{10} or 1,024	1/2 page
Megabyte (MB)	2^{20} or 1,048,576	500 pages or 1 thick book
Gigabyte (GB)	2^{30} or 1,073,741,824	500,000 pages or 1,000 thick books
Terabyte (TB)	2^{40} or 1,099,511,627,776	1,000,000 thick books
Petabyte	2^{50} or 1,125,899,906,842,624	180 Libraries of Congress
Exabyte	2^{60} or 1,152,921,504,606,846,976	180 thousand Libraries of Congress
Zettabyte	2^{70} or 1,180,591,620,717,411,303,424	180 million Libraries of Congress
Yottabyte	2^{80} or 1,208,925,819,614,629,174,706,176	180 billion Libraries of Congress

The Library of Congress in Washington D.C. is said to be the world's largest library with over 28 million volumes. The numbers listed in the chart above are based on the assumption that the average book has 200 pages. Most Compact Discs (CD) can hold approximately 750 megabytes (mB) which is roughly equivalent to 375,000 pages of text! DVDs can store 4.7 gigabytes (gB) or 2.3 million pages. The next generation of optical media, Blu-Ray discs, can hold an astonishing 27 gigabytes or 13.5 million pages which is roughly equivalent to the text contained in 67,500 books!

Data Measurement Chart		
Data Measurement	Size	
Bit	Single Binary Digit (1 or 0)	
Byte	8 bits	
Kilobyte (KB)		
	Bytes	1024 Bytes
	Bits	8192 Bits
Megabyte (MB)		
	Kilobytes	1,024 KB
	Bytes	1048576 Bytes
	Bits	8388608 Bits
Gigabyte (GB)		
	Megabytes	1,024 MB
	Kilobytes	1048576 KB
	Bytes	1073741824 Bytes
	Bits	8589934592 Bits
Terabyte (TB)		
	Gigabytes	1,024 GB
	Megabytes	1048576 MB
	Kilobytes	1073741824 KB
	Bytes	1099511627776 Bytes
	Bits	8796093022208 Bits
Petabyte (PB)		
	Terabytes	1,024 TB
	Gigabytes	1048576 GB
	Megabytes	1073741824 MB
	Kilobytes	1099511627776 KB
	Bytes	1125899906842624 Bytes
	Bits	9007199254740992 Bits
Exabyte (EB)		
	Petabytes	1,024 PB
	Terabytes	1048576 TB
	Gigabytes	1073741824 GB
	Megabytes	1099511627776 MB
	Kilobytes	1125899906842624 KB
	Bytes	11522921504606846976 Bytes
	Bits	1180591620717411303424 Bits