Computing Units - Reading

In Computing there are a number of useful units to know.

The most simple is the binary digit, also known as a bit. This is either 0 or 1.

8 bits are called a byte and 4 bits are called a nibble (half a byte). One nibble can be represented by one digit of hexadecimal, e.g. 1111 in binary is the same as F in hexadecimal.

In the International System of Units (SI Units) prefixes can be added to units. Kilo means 1000. For example, a kilogram is 1000 grams and a kilometre is 1000 metres.

A lowercase 'b' is used to mean bits; an uppercase 'B' is used to mean bytes.

The following tables show the common names for quantities of bytes*.

Number of bytes	Metric (SI)
1000	1 kB – kilobyte
1000*1000	1 MB – megabyte
1000*1000*1000	1 GB – gigabyte
1000*1000*1000*1000	1 TB – terabyte

Number of bits	Name
1	Bit (b)
4	nibble
8	Byte (B)

You may find the following mnemonic useful for remembering the order of prefixes.

kites	kilo
make	mega
great	giga
toys	tera

Question: How many bytes are there in 1 terabyte?
Answer: 1TB = 1000*1000*1000*1000 = **1 000 000 000 000 bytes**.
Or 1 trillion bytes

Question: A digital camera takes 13MB to save an image. What is this value in bytes?
Answer: 13MB = 13*1000KB = 13*1000*1000 bytes = **13 000 000 bytes**

Question: How many bits are contained in 1 kilobyte?
Answer: 1 kilobyte = 1000 bytes = 1000*8 bits = **8 000 bits**

Question: A graphics file contains 50MB of data. How many digits of hexadecimal would represent this?
Answer: 50MB = 50*1000*1000 bytes = 50 000 000 bytes = 50 000 000 * 8 bits
= 400 000 000 bits = 400 000 000/4 nibbles = 100 000 000 nibbles. Each nibble can be represented by 1 digit of hexadecimal.
So **100 000 000 digits of hexadecimal are required**.

*1024 bytes is 1 kibibyte and 1000 bytes is 1 kilobyte. Kibi comes from (kilo + binary). The other units are mebibyte, gibibyte and tebibyte. These are not commonly used, however, many people will refer to a kilobyte as 1024 bytes for this reason.