

Memory Sizes

bit: is the smallest unit of measurement for information

only two options are possible: 0 or 1

byte: 1 byte = 8 bits

A letter or digit requires at least one byte of memory.

| | | |
|---------------|---------------|---|
| kilobyte (KB) | ≈ 1,000 bytes | <i>One printed page consist of about 2000 characters (2 KB)</i> |
| megabyte (MB) | ≈ 1,000 KB | <i>typical photos have approximately 1 MB to 6 MB</i> |
| gigabyte (GB) | ≈ 1,000 MB | <i>One movie DVD has about 4 to 8 GB of memory</i> |
| terabyte (TB) | ≈ 1,000 GB | <i>equals approximately 200hours of high-definition cinema movies</i> |

For the sake of simplicity, 1000 is used instead of the correct conversion number 1024 (= 2^{10}).

Data Transmission Speed - Upload, Download

Note: Memory specifications are measured in bytes (e.g. hard disks, main memory), whereas the transfer speed is specified in **bits per second**.

conversion: 8 bits = 1 byte.

- **upload:** Data is copied from a computer to the Internet - for example, a photo on Facebook. An upload of data is way slower than a download.
- **download:** Data is downloaded from the Internet to one's own computer - e.g. a music file or a program.
- **transfer speed = transfer rate = data rate:**
 - bit/s** (bits per second) = number of bits that are transferred per second
 - 1 Kbit/s** (kilobit per second) = 1024 bit/s (about 1000 bit/s)
 - 1 Mbit/s** (megabit per second) = 1 048 576 bit/s (about 1 million bit/s)
 - 1 Gbit/s** (gigabit per second) = about 1 billion bit/s

A current broadband connection has download speeds of 20 Mbit/s to 150 Mbit/s and even more.

The **new mobile technology 5G** achieves download speeds of 1500 Mbit/s (=1.5 Gbit/s) and even more.

Answer the following questions:

1 byte = ___ bits.

Where do you use the unit Mbit/s? (2 correct)

A: upload download storage size

Where do you use the unit GB? Give an example.

A: _____

What download speeds does the new 5G mobile technology reach?

A: _____

What are the units of measurement for the memory size? Write them down in the order from the lowest to the highest.

A: _____

scan this QR-code, open the link and solve the quiz:



points achieved: _____