Knowledge Organiser R085/R087(LO1): Bandwidth

You must be able to demonstrate a thorough understanding of connection, bandwidth and data transfer speeds

Computer networks will send data using 1s and 0s, which are called bits.

The communication speed of a computer network is determined by how many bits can be sent in one second (bits/s).

1 thousand bits per second = 1 kilobits/s = 1kb/s

1 million bits per second = 1 Megabits/s = 1Mb/s

1 billion bits per second = 1 Gigabits/s = 1Gb/s

Bandwidth

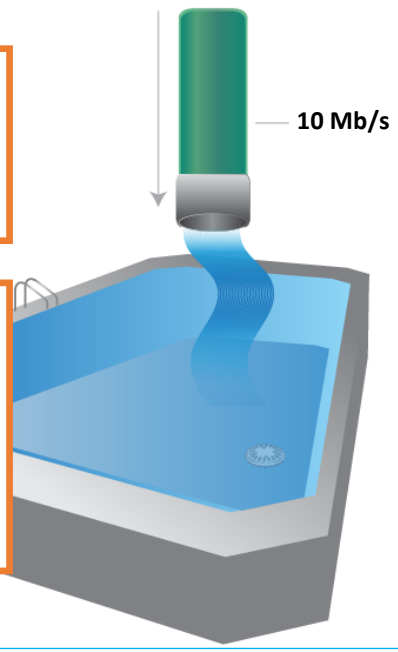
A bandwidth of 10 Mb/s

maximum 10 million bits in one second

Example: sending a high resolution tiff file that is 100 Mbits in size:

size/speed = time

100/10 = 10 seconds



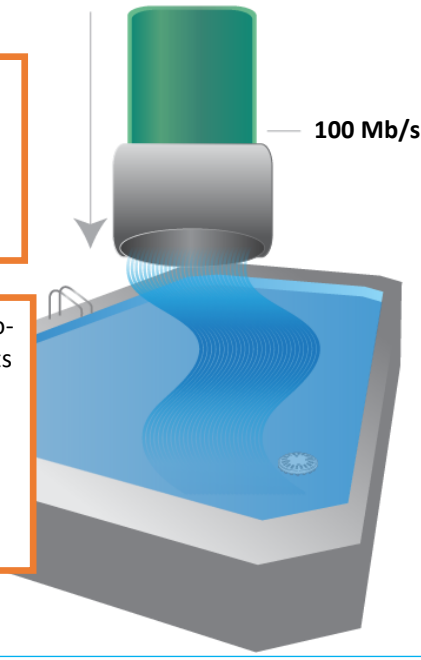
A **larger** bandwidth of 100 Mb/s

maximum 100 million bits in one second

Example: sending a high resolution tiff file that is 100 Mbits in size:

size/speed = time

100/100 = 1 second



- The **bandwidth** of a computer network is the maximum theoretical communication speed in bits/s.
- Increasing a network bandwidth increases **data transfer speed** (see above).
- There are many **limitations** which make data transfer speeds slower, resulting in longer time to send media.
- The actual **data transfer speed** is always slower than the bandwidth because the network needs to share the connection with other information.
- Bad quality **connections**, such as a weak Wi-Fi signal or a weak mobile phone connection, older network equipment, will also make the **data transfer speed** slower.
- Compressing video and audio files produces smaller files, so reduces the time to transfer a file.