

Representing sound

Sampling rate:

How many times a second a sample is taken.

The greater the sampling rate the better quality the sound will be

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A common audio **sample rate** for music is 44,100 samples per second

The unit for sample rate is **Hertz (Hz)**

44,100 samples per second is 44,100 Hertz or 44.1 kiloHertz (kHz)

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Telephone networks and **VOIP** use a sample rate as low as 8 kHz. This uses less data to represent the audio.

At 8 kHz, the human voice can still be heard clearly - but music at this sample rate would sound low quality.

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Sample resolution:

The number of bits used to store each sample is the sample resolution (or bit depth).

- CD quality: 16 bits per sample
- DVD quality: 24 bits per sample

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File size:

file size = rate x resolution x seconds

e.g. a 3 second sample is recorded at a sample rate of 8 kHz using 16 bit sampling resolution.

$$\text{size} = 8,000 \times 16 \times 3$$