Representing Sound

**Analogue data** is data that is infinitely variable – it is often represented as a wave

**Digital data** is often represented as discrete values, with the “on” and “off” states shown as flat peaks or troughs



Digital



Analogue

# Sound Sampling

When recorded, sound is sampled at certain points. Some clarity is lost, and higher sampling rates mean a clearer sound, but also a larger file size.

Higher sampling rate 🡺 Higher sound quality + larger file size

* The music industry most often uses 44.1kHz

**Nyquist’s Theorem:** Sampling Frequency ≥ 2 × Wave Frequency || 8 samples per cycle

**Sampling Depth / Sampling Resolution:** Number of bits used to store each sample

Tasks

1. What impact does the sample interval have on the quality of the sound stored?

*Higher sample interval 🡪 Lower sound quality*

1. What is meant by Sample resolution?

*Sample resolution = the number of bits used to store each sample*

1. What drawbacks are there of using a high sample rate and sample resolution when recording digital sound?

*It requires more precise equipment, and creates a larger sound file*

1. What is the process of recreating the sound wave from a digital file called and how does it work?

*The digital sound file is decoded, and the sampling data is sent to a speaker in the form of electrical signals, which causes the speaker to vibrate and recreate the sound waves.*