

# Knowledge Organiser: Sound manipulation in Audacity Record and edit a podcast

## Summary

**Audio** can be recorded on any device with a microphone and storage. Devices commonly used to record audio include: mobile phones, PCs or laptops with microphones, tablets and Dictaphones.

To share your audio, you may want to post it to an online service such as iTunes, SoundCloud or MyPodcast. An audio file shared online is often referred to as a **podcast**, especially when it is voice only. Podcasts can be downloaded using iTunes, Juice or Winamp.

The following are examples of programs that can be used to edit audio: Audacity, Adobe Audition and GarageBand.

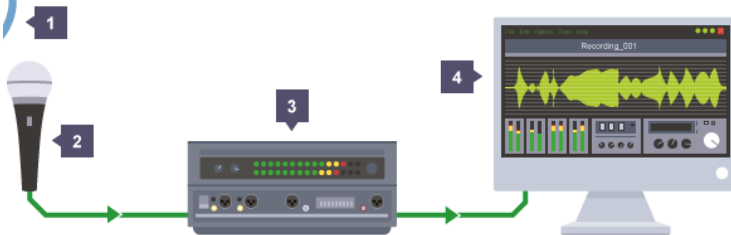
**Compression** is a useful tool for reducing file sizes. When images, sounds or videos are compressed, data is removed to reduce the file size. This is very helpful when **streaming** and **downloading** files. Compression can be **lossy** or **lossless**. **Lossless compression** means that as the file size is compressed, the audio quality remains the same - it does not get worse. **Lossy compression** permanently removes data.

## Key Vocabulary

<b>Audio sample</b>	A digital representation of a sound.
<b>Amplitude</b>	The maximum height of a wave from the middle of the wave to its the crest or trough.
<b>Binary</b>	A number system that contains two digits, 0 and 1. Also known as base 2.
<b>Bit rate</b>	In computing, the number of bits processed per second.
<b>Buffer</b>	A temporary area of computer memory used to store data for running processes.
<b>Downloading</b>	To copy a file from the internet onto your computer or device.
<b>File formats</b>	The way that a specific file type is saved, eg. a picture file is different from a text document. Different file formats have different file extensions, eg. *.jpg or *.txt).
<b>Podcast</b>	An audio file, usually similar to a radio show, that can be streamed or downloaded to a computer or mobile device.
<b>Sample rate</b>	How many samples of data are taken per second. This is normally measured in hertz, eg an audio file usually uses samples of 44.1 kHz (44,100 audio samples per second).

## Digital audio

Sounds created on a computer exist as digital information encoded as audio files. Sound input through a microphone is converted to digital for storage and manipulation. Digital sound is broken down into thousands of **samples** per second. Each sound sample is stored as **binary** data.



- 1 Microphone measures change in air pressure
- 2 Microphone translates air pressure into electrical voltage
- 3 Analogue to Digital Converter digitises the electrical voltage to bytes of information
- 4 Computer displays the digitised sound for manipulation

## Audio file formats

Audio can be recorded in several different file formats, the most common ones are:

- ◆MP3
- ◆AAC
- ◆WMA
- ◆WAV
- ◆FLAC
- ◆OGG

Podcasts are usually in MP3 format because of the format's relatively small file size.

## Common features of audio editing software

- ◆ Record, playback and edit audio
- ◆ Cut and trim - remove audio from the start or end, or choose the best bit and delete the rest
- ◆ Remove background noise, e.g. hissing
- ◆ Normalise or remove spikes and dips in volume
- ◆ Save or output audio in different file formats and at different quality settings
- ◆ Tag audio – add information about the audio to the file, e.g. author and credits

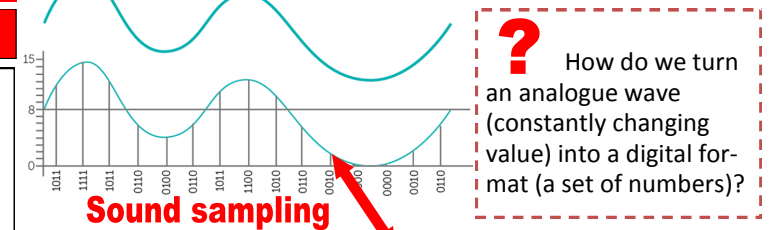
## Listening to music online

You do not have to **download** music or **podcasts** to listen to them - they can be streamed, too. You can stream music for free using services like Spotify and Grooveshark, but you may have to view or listen to the occasional advert.

## Listening to the radio online

Most mainstream radio stations provide a **streaming** service and there are plenty of stations out there that aren't well known that you can tune in and listen to for free.

## Digitizing sound



## Sound sampling

- ◆ We need to sample it regularly (take a measurement of the wave height).
- ◆ We can then list the samples as numbers.

```
sample-data4.txt - Notepad
File Edit Format View Help
sample-data4.txt 1 channel (mono)
Sample Rate: 44100 Hz. Sample values on dB scale.
Length processed: 100 samples 0.00227 seconds.

-26.04396j
-21.80810
-18.83301
-16.92880
-15.84646
-15.37631
-15.34524
-15.64505
-16.26512
-17.48547
-19.27824
-21.86377
```

## Sampled data