

## 1. Intro to Sound

- Sounds are pressure waves of air.
- **Volume**, the higher the wave the louder the sound.
- **Pitch or frequency**, the closer together the waves the higher the pitch.

## 2. Sound Representation

- **The Nyquist Limit** take 2 or more samples per wave.

## 3. Digital format

- **Sample rate**: the number of samples taken per second.
- **Sample sizing** (AKA bit depth), the higher the sample size the better the sound and the bigger the file.
- **Channels**:
  - o **Mono Signal**: one channel (stream) of data reproduced equally on both speaker channels.
  - o **Stereo Signal**: two channels of data, double the size of mono but higher quality.
- **Codecs**: software programs that reduce the audio file sizes.
  - o Examples: mp3, wav, m4a.

## 4. Sound Editing

- Edits: unwanted noise, pauses, trimming.
- Fade-in, fade-out and other effects.
- Mix different audio files.
- Save files in different formats, mp3, wav, etc...

## 5. Sound Compression strategies: how?

- Reduce number of samples (sample rate).
- Reduce bit depth (sample size).
- Reduce channels from stereo to mono. (Cuts the size in half.)
- Compress using appropriate codecs.

## 6. Lossy vs. lossless

- Lossless are raw audio files, and lossy are audio files that compressed to save space getting rid of less-significant data.
- Lossy most common file format is mp3 where lossless most common file format is wav.

## 7. Midi Music

- Midi music is a musical instrument with digital interface.
- **Advantages**:
  - o More compact
  - o Small files that are easy to edit
  - o 3 minutes = 10KB, where 3 minutes in another format is approximately 15 MB

- **Disadvantages:**
  - Doesn't produce high quality vocal sounds.

#### 8. Downloadable vs. Streamed Audios

Downloadable		Streamed	
Advantages	Disadvantages	Advantages	Disadvantages
Once downloaded, can be replayed and edited.	Takes long time to download.	Plays immediately	Can't rewind, pause replay, etc...
Don't need a special streaming web server to post the site.	Takes up space on your PC.	Consumes RAM only while being played.	Need a special server to post.

#### 9. Embedding sound into a web page.

- Linking to the sound file, have a link for the file that the user clicks and that will direct him to the file.
- Embed the sound file in your website, the autostart can be edited through a true and false statements.