Digital Consumer Formats - Knowledge Organiser

GLOSSARY	
Lossless Compression	A digital audio compression format that preserves the original audio data
Lossy Compression	A digital audio compression format that removes some of the original audio data
Bit-Rate	A measure of the number of bits of data being handled per second (measured in kbps (kilobits per second)) **A higher bit rate = A bigger file size**
High Resolution (Hi-Res) Audio	Any audio file recorded with a sample rate higher than **44.1kHz** and a bit depth higher than **16 bits** (HD audio) **16bit/44.1kHz is referred to as CD quality**
WAV	Waveform Audio Format (Windows)
AIFF	Audio Interchange File Format (Apple)
FLAC	Free Lossless Audio Codec

LOSSLESS COMPRESSION	LOSSY COMPRESSION

• Able to store audio in a smaller file size by removing unnecessary data (i.e., silences in the audio)
  • The original uncompressed data can be recreated exactly, resulting in no reduction in quality
	• Able to store audio in a smaller file size by removing some audio data
	  • Able to achieve smaller file sizes but the overall audio quality is reduced

PROS AND CONS OF DIGITAL AUDIO FORMATS	
Pros	**Cons**
• Easier to share audio with others compared to analogue	• Some formats reduce audio quality when compressed (lossy)
• Easier to buy/stream albums compared to analogue	• There is a lack of a physical product when purchased
• Some formats can compress the audio while leaving the quality intact (lossless)	• Piracy is much easier compared to analogue

<table>
<tr><th colspan="2">COMPACT DISK (CD)</th></tr>
<tr><td colspan="2">• Stores digital (binary) audio data in the form of pits stamped on a disk
• These pits are then read by a laser
• The CD player will then convert the binary data into an analogue signal to be sent to an amplifier</td></tr>
<tr><th>Pros</th><th>Cons</th></tr>
<tr><td>• Better signal-to-noise ratio compared to analogue formats</td><td>• Scratches can cause problems with playback</td></tr>
<tr><td>• Doesn’t deteriorate due to continued use</td><td>• The timbre isn’t as ‘warm’/desirable compared to analogue formats</td></tr>
<tr><td>• Cheaper to produce compared to analogue formats</td><td></td></tr>
<tr><td>• Better frequency response compared to analogue formats</td><td></td></tr>
<tr><td>• Easy to transfer data between devices</td><td></td></tr>
<tr><th colspan="2">ONLINE STREAMING</th></tr>
<tr><td colspan="2">• Has grown a lot in popularity in recent years due to consumer trends
• Uses compressed audio formats for consumers to listen to online
• Audio quality is below CD quality but is compensated by the fact that consumers generally use cheaper playback devices (i.e., earbuds)
  • Some services such as TIDAL offer high fidelity (Hi-Fi) streaming options with access to uncompressed audio files</td></tr>
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