

Sound Resolution and File Sizes

Sound quality can be measured by its frequency (kilohertz or kHz), its bit depth (8- or 16-bit) and the number of sound channels available (usually one (mono) or two (stereo)). These factors determine a sound's resolution.

The higher the frequency, bit depth, and number of channels used to make up a sound, the better the quality of sound. High quality sounds make large sound files.

The lower the frequency, bit depth, and number of channels used for a sound the lower the quality of that sound. Lower quality sounds create smaller sound file sizes.

This grid shows the file sizes associated with sounds of different frequencies, bit depths and number of channels (Mono or Stereo). All sound file sizes are uncompressed and are measured in kilobytes (K).

SOUND DURATION = 1 SECOND				
		LOWER QUALITY → HIGHER QUALITY		
		SAMPLING RATE	MONO	STEREO
8 BIT	7.418 kHz	●	7 K	15 K
	11.025 kHz		11 K	22 K
	22.050 kHz	●	22 K	44 K
	44.1 kHz		44 K	88 K
16 BIT	7.418 kHz		15 K	30 K
	11.025 kHz		22 K	44 K
	22.050 kHz		44 K	88 K
	44.1 kHz		88 K	● 176 K

TELEPHONE QUALITY — (8-bit / 22 kHz / mono)

ACCEPTABLE QUALITY FOR MOST MULTIMEDIA PROJECTS — (8-bit / 22 kHz / mono)

CD AUDIO QUALITY — (16-bit / 44.1 kHz / mono)

A minimal acceptable quality level for most multimedia projects is a sound whose resolution is 8-bit / 22 kHz / mono sound. This resolution is commonly used because the file size doesn't take up much space on a hard drive, and the file is small enough to load into RAM quickly. But at this resolution, music high frequencies can drop out and the overall sound can become "muddy". Spoken voice is understandable at this resolution.

In the past, Shockwave movies that played over the Internet tended to rely on a 8-bit / 22 kHz / mono sound as well as 8-bit / 11 kHz / mono sound. These resolutions worked well because they didn't create huge file sizes when used carefully. Today, with streaming audio and better compression technologies, higher quality sounds are used more often, and this is likely to grow even further as compression techniques and bandwidth improve.

Due to increases in CD-ROM drive and download speeds, and the availability of more RAM on the average computer, 16-bit / 22KHz / mono sound is now becoming standard for both Web and non-Web deployment.