

FREQUENCY RANGES OF MUSICAL INSTRUMENTS AND VOICES																																																																																																			
Frequency (Hertz)										Standard pitch										A4										440 Hz										Wavelength (centimeters)										Wavelength (millimeters)																																																	
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The top and bottom rows of numbers state frequencies in Hertz (periods per second) for each tone in the Western 12-tone equal-tempered scale, referenced to the standard pitch shown top center. The bottom row shows these frequencies to approximately four significant digits, while the top row rounds to the nearest integer.

The first graphical element divides the frequency range into named sub-ranges, such as "Bass" and "Treble", and indicates typical terms to express the subjective impression of too much (excess) or too little (deficit) energy in various frequency ranges. Note that too much energy in one range can sound similar to too little energy in a different range.

The main part of the diagram shows the frequency range of various instruments and voices. In some cases, there are lighter-colored extensions to the range to indicate that some instruments or voices may extend further, e.g., a seven-string vs six-string guitar or a Bösendorfer grand piano. For voices, this indicates the core repertoire for a voice and the additional range that is needed in some pieces. The extreme low bass range (55-60 Hz) is for certain Russian church singers only.

The two curves across the diagram indicates the ear's sensitivity to different frequencies in two different ways. The blue dB(A) weighting curve approximates the Fletcher-Munson curves for perceived loudness at different frequencies. The red ITU-R 468 noise weighting curve approximates the subjective annoyance of noise at different frequencies. The decibel scale on the right side of the diagram belongs to these curves.

The content in this diagram are collected over some time from many different sources. The errors, if any, are all mine. At some point in the future, I might put together a time domain version of this chart to indicate the resolution of the ear-brain system and the subjective effect of deviations in the time domain.