

Comparing Temperaments – Tables

This document includes several tables comparing different temperaments. This allows for easy comparison of the different sizes of the intervals and frequencies. It is formatted for legal-size paper so you may need to select “fit to print” or adjust the print scale for proper output. One of the tables would not fit on standard paper.

Comparison of Musical Temperaments

		Just Interval Scale				Equal Temperament Scale						Scale of Twelve Fifths			Pythagorean		
Interval	Note	Ratio	A=440 Freq	A=432 Freq	C=256 Frequ	Ratio	A=440 Freq	A=432 Freq	C=256 Freq	cents	change in cents	Ratio	A=440 Freq	A=432/C =256 Freq	Ratio	Derivation	Cents*
Tonic	C	1	264	259.2	256	1	261.63	256.87	256	0	+100 cents	1	260.74	256	1024/729	Unison 1:1	0
Minor 2nd	c#	16/15	281.6	276.48	273.07	2 ^{1/12}	277.18	272.14	271.22	100	+100 cents	(3/4)v2	276.56	271.53	256/243	Octave - M7	90.22
Major 2nd	D	10/9	293.33	288	284.44	2 ^{1/6}	293.66	288.33	287.35	200	+100 cents	9/8	293.33	288	2187/2048	(3:2)^2	203.91
Minor 3rd	d#	6/5	316.8	311.04	307.2	2 ^{1/4}	311.13	305.47	304.44	300	+100 cents	(27/32)v2	311.13	305.47	256/243	Octave - M6	294.13
Major 3rd	E	5/4	330	324	320	2 ^{1/3}	329.63	323.63	322.54	400	+100 cents	81/64	330	324	2187/2048	(3:2)^4	407.82
Perfect4th	F	4/3	352	345.6	341.33	2 ^{5/12}	349.23	342.88	341.72	500	+100 cents	4/3	347.65	341.33	256/243	Octave - 5	498.04
Augmented 4th	F#	45/32	371.25	364.5	360	v2	369.99	363.27	362.04	600	+100 cents	v2	368.74	362.04	256/243	(3:2)^6	611.73
Diminished 5th	Gb	64/45	375.47	368.64	364.09										531441/524288		
Perfect 5th	G	3/2	396	388.8	384	2 ^{7/12}	391.99	384.87	383.57	700	+100 cents	3/2	391.11	384	256/243	(3:2)^1	701.96
Minor 6th	G#	8/5	422.4	414.72	409.6	2 ^{2/3}	415.3	407.75	406.37	800	+100 cents	(9/8)v2	414.84	407.29	256/243	Octave - M3	792.18
Major 6th	A	5/3	440	432	426.67	2 ^{3/4}	440	432	430.54	900	+100 cents	27/16	440	432	2187/2048	(3:2)^3	905.87
Minor 7th	A#	9/5	475.2	466.56	460.8	2 ^{5/6}	466.16	457.69	456.14	1000	+100 cents	(81/64)v2	466.69	458.21	256/243	Octave - M2	996.09
Major 7th	B	15/8	495	486	480	2 ^{11/12}	494	484.9	483.26	1100	+100 cents	243/128	495	486	2187/2048	(3:2)^5	1109.78
Octave	C	2	528	518.4	512	2	523.25	513.74	512	1200	+100 cents	2	521.48	512	256/243	Octave 2:1	1200

c=256 is middle C on piano

Meantone Temperaments

Classic Name	Note	12-EDO Steps	12-EDO Cents	19-EDO Steps	19-EDO Cents	31-EDO Steps	31-EDO Cents	50-EDO Steps	50-EDO Cents
Unison	C	0	0	0	0	0	0	0	0
Diminished second	Cb			1	63.16	1	38.71	2	48
Chromatic semitone	C#	1	100			2	77.42	3	72
Minor second	Db			2	200	3	126.32	5	120
Whole tone	D	2	200			3	189.47	5	193.55
Diminished third	Ebb			3	300	4	252.63	6	232.26
Augmented second	D#	3	300				4	252.63	7
Minor third	Eb			4	400	5		315.79	8
Major third	E	4	400				6	378.95	10
Diminished fourth	Fb			5	500	7		442.11	11
Augmented third	E#	5	500				7		442.11
Perfect fourth	F			6	600	8		505.26	
Augmented fourth	F#	6	600				9		568.42
Diminished fifth	Gb			7	700	10		631.58	
Perfect fifth	G	7	700				11		694.74
Diminished sixth	Abb			8	800	12		757.89	
Augmented fifth	G#	8	800				12		757.89
Minor sixth	Ab			9	900	13		821.05	
Major sixth	A	9	900				14		884.21
Diminished seventh	Bbb			10	1000	15		947.37	
Augmented sixth	A#	10	1000				15		947.37
Minor seventh	Bb			11	1100	16		1010.53	
Major seventh	B	11	1100				17		1073.68
Diminished octave	Cb			12	1200	18		1136.84	
Augmented seventh	B#	12	1200				18		1136.84
Octave	C			19	1200	31		1200	

Pythagorean Calculated from the Center note (A)

Note	Interval	Decimal	Frequency (Hz)
E $\flat$	diminished fifth	1.40466	606.81
B $\flat$	minor second	1.05349	455.11
F	minor sixth	1.58024	682.66
C	minor third	1.18518	512
G	minor seventh	1.77777	768
D	perfect fourth	1.33333	576
A	unison	1	432
E	perfect fifth	1.5	648
B	major second	1.125	486
F $\sharp$	major sixth	1.6875	729
C $\sharp$	major third	1.265625	546.75
G $\sharp$	major seventh	1.898437	820.12
A $\flat$	augmented fourth	1.423828	615.09

Frequency Chart (A Major, A₄ = 440 Hz)

Note	Equal Temperament (Hz)	Pythagorean Tuning (Hz)	Just Intonation (Hz)	Just Ratio
A	440.00	440.00	440.00	1/1
B	493.88	495.00	495.00	9/8
C#	554.37	562.50	550.00	5/4
D	587.33	586.67	586.67	4/3
E	659.26	660.00	660.00	3/2
F#	739.99	742.50	733.33	5/3
G#	830.61	843.75	825.00	15/8
A ₅	880.00	880.00	880.00	2/1

Note	Equal Temperament (Hz)	Pythagorean Tuning (Hz)	Just Intonation (Hz)	Meantone Tuning (Hz)	Interval Ratio (JI)
A	440.00	440.00	440.00	440.00	1/1
B	493.88	495.00	495.00	492.80	9/8
C#	554.37	562.50	550.00	551.32	5/4
D	587.33	586.67	586.67	586.66	4/3
E	659.26	660.00	660.00	659.26	3/2
F#	739.99	742.50	733.33	733.33	5/3
G#	830.61	843.75	825.00	825.00	15/8
A ₅	880.00	880.00	880.00	880.00	2/1