

Note	Half Step from A4	Scale as Harmonic Series (Equal Tempered) (Hz)	Ratios (Approx)		A Just Scale (Hz)	Ratios		"Beat" Frequency	Cents
A	-12	220.0	0.50000	1/2	220.0	0.500000	1/2	0.0	0.0
A#	-11	233.1	0.52973	9/17	229.2	0.520833	25/48	3.9	29.3
B	-10	246.9	0.56123	55/98	247.5	0.562500	9/16	0.6	-3.9
C	-9	261.6	0.59460	22/37	264.0	0.600000	3/5	2.4	-15.6
C#	-8	277.2	0.62996	17/27	275.0	0.625000	5/8	2.2	13.7
D	-7	293.7	0.66742	2/3	293.3	0.666667	2/3	0.3	2.0
D#	-6	311.1	0.70711	70/99	309.4	0.703125	45/64	1.8	9.8
E	-5	329.6	0.74915	3/4	330.0	0.750000	3/4	0.4	-2.0
F	-4	349.2	0.79370	50/63	352.0	0.800000	4/5	2.8	-13.7
F#	-3	370.0	0.84090	37/44	366.7	0.833333	5/6	3.3	15.6
G	-2	392.0	0.89090	49/55	396.0	0.900000	9/10	4.0	-17.6
G#	-1	415.3	0.94387	84/89	412.5	0.937500	15/16	2.8	11.7
A	0	440.0	1.00000	1/1	440.0	1.000000	1/1	0.0	0.0
A#	1	466.2	1.05946	89/84	458.3	1.041667	25/24	7.8	29.3
B	2	493.9	1.12246	55/49	495.0	1.125000	9/8	1.1	-3.9
C	3	523.3	1.18921	44/37	528.0	1.200000	6/5	4.7	-15.6
C#	4	554.4	1.25992	63/50	550.0	1.250000	5/4	4.4	13.7
D	5	587.3	1.33484	4/3	586.7	1.333333	4/3	0.7	2.0
D#	6	622.3	1.41421	99/70	618.8	1.406250	45/32	3.5	9.8
E	7	659.3	1.49831	3/2	660.0	1.500000	3/2	0.7	-2.0
F	8	698.5	1.58740	100/63	704.0	1.600000	8/5	5.5	-13.7
F#	9	740.0	1.68179	37/22	733.3	1.666667	5/3	6.7	15.6
G	10	784.0	1.78180	98/55	792.0	1.800000	9/5	8.0	-17.6
G#	11	830.6	1.88775	185/98	825.0	1.875000	15/8	5.6	11.7
A	12	880.0	2.00000	2/1	880.0	2.000000	2/1	0.0	0.0
		Equal Tempered			Just				
	Steps	Frequency	Ratio	Fraction	Frequency	Ratio	Fraction	Differenc	Cents
A	0	440.0	1.00000	1/1	440.0	1.000000	1/1	0.0	0
A#	1	460.8	1.04729	22/21	458.3	1.041667	25/24	2.5	12
	2	482.6	1.09682	34/31	484.0	1.100000	11/10	-1.4	-6
B	3	505.4	1.14870	85/74	495.0	1.125000	9/8	10.4	45
C	4	529.3	1.20303	77/64	528.0	1.200000	6/5	1.3	5
C#	5	554.4	1.25992	63/50	550.0	1.250000	5/4	4.4	17
D	6	580.6	1.31951	95/72	586.7	1.333333	4/3	-6.1	-23
	7	608.0	1.38191	76/55	605.0	1.375000	11/8	3.0	11
	8	636.8	1.44727	55/38	635.6	1.444444	13/9	1.2	4
E	9	666.9	1.51572	97/64	660.0	1.500000	3/2	6.9	23
F#	10	698.5	1.58740	100/63	704.0	1.600000	8/5	-5.5	-17
F#	11	731.5	1.66248	133/80	733.3	1.666667	5/3	-1.8	-5
	12	766.1	1.74110	148/85	770.0	1.750000	7/4	-3.9	-11
B	13	802.3	1.82344	31/17	792.0	1.800000	9/5	10.3	28
	14	840.3	1.90968	21/11	836.0	1.900000	19/10	4.3	11
A	15	880.0	2.00000	2/1	880.0	2.000000	2/1	0.0	0
		Equal Tempered			Just				
	Steps	Frequency	Ratio	Fraction	Frequency	Ratio	Fraction	Differenc	Cents
A	0	440.0	1.000000	1/1	440.0	1.000000	1/1	0.0	0
	1	475.2	1.080060	27/25	476.7	1.083333	13/12	-1.4	-4
	2	513.3	1.166529	7/6	513.3	1.166667	7/6	-0.1	0
C#	3	554.4	1.259921	63/50	550.0	1.250000	5/4	4.4	10
D	4	598.7	1.360790	132/97	586.7	1.333333	4/3	12.1	26
E	5	646.7	1.469734	97/66	660.0	1.500000	3/2	-13.3	-26
F	6	698.5	1.587401	100/63	704.0	1.600000	8/5	-5.5	-10
	7	754.4	1.714488	12/7	754.3	1.714286	12/7	0.1	0
	8	814.8	1.851749	50/27	806.7	1.833333	11/6	8.1	13
A	9	880.0	2.000000	2/1	880.0	2.000000	2/1	0.0	0