## Piano key frequencies

This is a **virtual keyboard** showing the absolute frequencies in hertz (cycles per second) of the notes on a modern piano (typically containing 88 keys) in twelve-tone equal temperament, with the 49th key, the fifth A (called A4), tuned to 440 Hz (referred to as A440). Each successive pitch is derived by multiplying (ascending) or dividing (descending) the previous by the twelfth root of two (approximately 1.05946309435929...). For example, to get the frequency a semitone up from A4 (A‡4), multiply 440 by the twelfth root of two. To go from A4 to B4 (up a whole tone, or two semitones), multiply 440 twice by the twelfth root of two. For other tuning schemes refer to musical tuning.

This list of frequencies is for a theoretically ideal piano. On an actual piano the ratio between semitones is slightly larger, especially at the high and low ends, where string stiffness causes inharmonicity, i.e., the tendency for the harmonic makeup of each note to run sharp. To compensate for this, octaves are tuned slightly wide, stretched according to the inharmonic characteristics of each instrument. This deviation from equal temperament is called the Railsback curve.

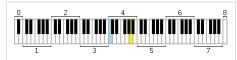
The following equation will give the frequency f of the n<sup>th</sup> key, as shown in the table:

$$f(n) = 440 \ (\sqrt[12]{2})^{n-49}$$

Alternatively, this can be written as:

$$f(n) = 440 \times 2^{\frac{n-49}{12}}$$

### Virtual keyboard



An 88-key piano, with the octaves numbered and Middle C (cyan) and A440 (yellow) highlighted.

Key number	Helmholtz name	Scientific name	Frequency (Hz)	Corresponding Open Strings					
				Violin	Viola	Cello	Bass	Guitar	
88	c'''' 5-line octave	C8 Eighth octave	4186.01						
87	b''''	В7	3951.07						
86	a#''''/bb''''	Α#7/Bb7	3729.31						
85	a''''	A7	3520.00						
84	g#''''/ab''''	G#7/Ab7	3322.44						
83	g''''	G7	3135.96						
82	f#''''/gb''''	F#7/Gb7	2959.96						
81	f''''	F7	2793.83						
80	e''''	E7	2637.02						
79	d♯''''/eb''''	D#7/Eb7	2489.02						
78	d''''	D7	2349.32						
77	c#''''/db''''	C#7/Db7	2217.46						
76	c''' 4-line octave	C7 Double high C	2093.00						

75	b'''	В6	1975.53				
74	a#'''/bb'''	Α#6/Bb6	1864.66				
73	a′′′	A6	1760.00				
72	g#'''/ab'''	G#6/Ab6	1661.22				
71	g'''	G6	1567.98				
70	f#'''/gb'''	F#6/Gb6	1479.98				
69	f'''	F6	1396.91				
68	e'''	E6	1318.51				
67	d#'''/eb'''	D#6/Eb6	1244.51				
66	ď"	D6	1174.66				
65	c#'''/db'''	C#6/Db6	1108.73				
64	c''' 3-line octave	C6 Soprano C (High C)	1046.50				
63	b''	B5	987.767				
62	a#''/bb''	A#5/Bb5	932.328				
61	a''	A5	880.000				
60	g‡''/ab''	G#5/Ab5	830.609				
59	g"	G5	783.991				
58	f‡''/gb''	F#5/Gb5	739.989				
57	f"	F5	698.456				
56	e"	E5	659.255	Е			
55	d#''/eb''	D#5/Eb5	622.254				
54	ď"	D5	587.330				
53	c#''/db''	C#5/Db5	554.365				
52	c" 2-line octave	C5 Tenor C	523.251				
51	b'	B4	493.883				
50	a#'/bb'	A#4/Bb4	466.164				
49	a'	A4 A440	440.000	A	A		
48	g#'/ab'	G#4/Ab4	415.305				
47	g'	G4	391.995				
46	f#'/gb'	F#4/Gb4	369.994				
45	f'	F4	349.228				
44	e'	E4	329.628				High E
43	d#'/eb'	D#4/Eb4	311.127				
42	ď′	D4	293.665	D	D		
41	c#'/db'	C#4/Db4	277.183				
40	c' 1-line octave	C4 Middle C	261.626				
39	b	В3	246.942				В
38	a#/bb	Α#3/Βb3	233.082				
37	a	A3	220.000			A	

34       f#/gb       F#3/Gb3       184.997         33       f       F3       174.614         32       e       E3       164.814         31       d#/eb       D#3/Eb3       155.563         30       d       D3       146.832       D       D         29       c#/db       C#3/Db3       138.591       C         28       c small octave       C3 Low C       130.813       C         27       B       B2       123.471       C         26       A#/Bb       A#2/Bb2       116.541       C         25       A       A2       110.000       A         24       G#/Ab       G#2/Ab2       103.826       G         23       G       G2       97.9989       G       G         22       F#/Gb       F#2/Gb2       92.4986       G         21       F       F2       87.3071									
1	36	g#/ab	G#3/Ab3	207.652					
33	35	g	G3	195.998	G	G			G
32         e         E3         164.814         155.563         153.63         155.563	34	f#/gb	F#3/Gb3	184.997					
31         d#/eb         D#3/Eb3         155.563         D         I           30         d         D3         146.832         D         D         I           29         cg//db         C#3/Db3         138.591         D         I           28         c small octave         C3 Low C         130.813         C         C           27         B         B2         123.471         D         D         D         I           26         A#/Bb         A#2/Bb2         116.541         D         D         I	33	f	F3	174.614					
30         d         D3         146.832         D         I           29         cgt/db         Cξ3/Db3         138.591         I           28         c small octave         C3 Low C         130.813         C           27         B         B2         123.471         I           26         A#/Bb         A#2/Bb2         116.541         I           25         A         A2         110.000         I         I           24         G#/Ab         G#2/Ab2         103.826         I         I           23         G         G2         97.9989         G         G         G           22         F#/Gb         F#2/Gb2         92.4986         I         Low         I	32	e	E3	164.814					
29         c#/db         C#3/Db/3         138.591         C           28         c small octave         C3 Low C         130.813         C           27         B         B2         123.471         C           26         A#/Bb         A#2/Bb2         116.541         C           25         A         A2         110.000         J           24         GB/Ab         GB2/Ab2         103.826         G           23         G         G2         97.9989         G         G           22         FB/Gb         F#2/Gb2         92.4986         C         Lox           21         F         F2         87.3071         C         Lox           19         D#/Eb         D#2/Eb2         77.7817         D         Lox           19         D#/Eb         D#2/Eb2         77.7817         D         D         D           17         C#/Db         C#2/Db2         69.2957         D	31	d#/eb	D#3/Eb3	155.563					
28         c small octave         C3 Low C         130.813         C           27         B         B2         123.471         1           26         A#βb A#2/Bb A#2/Bb2         116.541         1           25         A         A2         110.000         A           24         G#/Ab G#2/Ab2         103.826         G           23         G         G2         97.9989         G         G           22         F#/Gb         F#2/Gb2         92.4986         D         Lov           21         F         F2         87.3071         D         Lov           19         D#/Eb         D#/Eb2         77.7817         D         Lov           19         D#/Eb         D#/Eb2         77.7817         D         D         D           18         D         D2         73.4162         D         D         D           17         C#/Db         C#2/Db2         69.2957         D         D         D         D         D         D         D         D         D         D         D         D         A         A         A         A         A         A         A         A         A	30	d	D3	146.832			D		D
27         B         B2         123.471         126         A#/Bb         A#2/Bb2         116.541         116.541         116.541         116.541         116.541         117.541         117.541         117.541         117.541         117.541         117.541         117.541         117.541         117.541         117.541         118.541         118.541         118.541         118.541         118.541         118.541         118.542         118.542         118.542         118.542         118.542         118.542         119.542	29	c#/db	C#3/Db3	138.591					
26         A#/Bb         A#/Z/Bb2         116.541            25         A         A2         110.000             24         G#/Ab         G#Z/Ab2         103.826              23         G         G2         97.9989         G         G            22         F#Gb         F#Z/Gb2         92.4986              21         F         F2         87.3071	28	c small octave	C3 Low C	130.813		С			
25 A A A2 110,000 A2  24 G#/Ab G#2/Ab2 103,826  23 G G2 97,9989 G G  22 F#/Gb F#2/Gb2 92,4986  21 F F2 87,3071  20 E E2 82,4069 Lov  19 D#/Eb D#2/Eb2 77,7817  18 D D2 73,4162 D  17 C#/Db C#2/Db2 69,2957  16 C great octave C2 Deep C 65,4064 C  15 B, B1 61,7354  14 A#/Bb, A#1/Bb1 58,2705  13 A, A1 55,0000 A  12 G#/Ab, G#1/Ab1 51,9131  11 G, G1 48,9994  10 F#/Gb, F#1/Gb1 46,2493  9 F, F1 43,6535  8 E, E1 41,2034 E  7 D#/Eb, D#1/Eb1 38,8909  6 D, D1 36,7081  5 C#/Db, C#1/Db1 34,6478  4 C, contra-octave C1 Pedal C 32,7032  3 B, B0 30,8677 B B (5-string)  2 A#/Bb, A#0/Bb0 29,1352	27	В	B2	123.471					
24         G#/Ab         G#2/Ab2         103.826         G           23         G         G2         97.9989         G         G           22         F#/Gb         F#2/Gb2         92.4986         D         Lov           21         F         F2         87.3071         D         Lov           19         D#/Eb         D#2/Eb2         77.7817         D         Lov           18         D         D2         73.4162         D         D           17         C#/Db         C#2/Db2         69.2957         D         D           16         C great octave         C2 Deep C         65.4064         C         C           15         B,         B1         61.7354         D         C           15         B,         B1         55.0000         A         A           12         G#/Ab,         G#1/Ab1         51.9131         A         A         A           12         G#/Ab,         G#1/Ab1         51.9131         A         A         A         A           10         F#/Gb,         F#1/Gb1         46.2493         B         A         B         E         B         E         B	26	Α‡/Βb	A#2/Βb2	116.541					
23         G         G2         97.9989         G         G           22         Fβ/Gb         Fβ2/Gb2         92.4986         —           21         F         F2         87.3071         —           20         E         E2         82.4069         —         Lov           19         Dβ/Eb         Dβ2/Eb2         77.7817         —         —         D         —         D         —         D         —         D         —         D         —         D         D         —         D         D         —         D         D         —         D         —         D         D         —         D         D         —         D         A         D         D         D         D         D         D         D         D         D         D <td>25</td> <td>A</td> <td>A2</td> <td>110.000</td> <td></td> <td></td> <td></td> <td></td> <td>A</td>	25	A	A2	110.000					A
22         F#/Gb         F#2/Gb2         92.4986           21         F         F2         87.3071           20         E         E2         82.4069         Lov           19         D#Zb         D#2/Eb2         77.7817         D           18         D         D2         73.4162         D         D           17         C#/Db         C#2/Db2         69.2957         C         D           16         C great octave         C2 Deep C         65.4064         C         C           15         B,         B1         61.7354         C         C           15         B,         B1         61.7354         A         A         A           14         A#/Bb,         A#1/Bb1         58.2705         A	24	G‡/Ab	G#2/Ab2	103.826					
21       F       F2       87.3071       Low         20       E       E2       82.4069       Low         19       D#/Eb       D#/Eb       D#/Eb2       77.7817         18       D       D2       73.4162       D         17       C#/Db       C#/ZDb2       69.2957       D         16       C great octave       C2 Deep C       65.4064       C         15       B,       B1       61.7354       D         14       A#/Bb,       A#1/Bb1       58.2705       A         13       A,       A1       55.0000       A         12       G#/Ab,       G#1/Ab1       51.9131       A         11       G,       G1       48.9994       A         10       F#/Gb,       F#1/Gb1       46.2493       B         9       F,       F1       43.6535       B         8       E,       E1       41.2034       E         7       D#/Eb,       D#1/Eb1       38.8909       B         6       D,       D1       36.7081       B         5       C#/Db,       C#1/Db1       34.6478       B         4       <	23	G	G2	97.9989			G	G	
20         E         E2         82.4069         Lov           19         D#/Eb         D#2/Eb2         77.7817         D           18         D         D2         73.4162         D           17         C#/Db         C#2/Db2         69.2957         D           16         C great octave         C2 Deep C         65.4064         C           15         B,         B1         61.7354         D           14         A#/Bb,         A#1/Bb1         58.2705         A           13         A,         A1         55.0000         A           12         G#/Ab,         G#1/Ab1         51.9131         A           11         G,         G1         48.9994         A           10         F#/Gb,         F#1/Gb1         46.2493         A           9         F,         F1         43.6535         B           8         E,         E1         41.2034         E           7         D#/Eb,         D#1/Eb1         38.8909         B           6         D,         D1         36.7081         B           5         C#/Db,         C#1/Db1         34.6478         B	22	F♯/G♭	F#2/Gb2	92.4986					
19       D♯/Eb       D♯/Eb       D♯/Eb2       77.7817         18       D       D2       73.4162       D         17       C♯/Db       C♯2/Db2       69.2957         16       C great octave       C2 Deep C       65.4064       C         15       B,       B1       61.7354       C         14       A♯/Bb,       A♯1/Bb1       58.2705       A         13       A,       A1       55.0000       A         12       G♯/Ab,       G♯1/Ab1       51.9131         11       G,       G1       48.9994         10       F♯/Gb,       F♯1/Gb1       46.2493         9       F,       F1       43.6535         8       E,       E1       41.2034       E         7       D♯/Eb,       D♯1/Eb1       38.8909         6       D,       D1       36.7081         5       C♯/Db,       C♯1/Db1       34.6478         4       C, contra-octave       C1 Pedal C       32.7032         3       B,       B0       30.8677       B (5-string)         2       A♯./Bb,       A♯0/Bb0       29.1352	21	F	F2	87.3071					
18       D       D2       73.4162       D         17       C♯/D♭       C♯/D♭2       69.2957       C         16       C great octave       C2 Deep C       65.4064       C         15       B,       B1       61.7354       C         14       A♯/B♭,       A♯1/B♭1       58.2705       C         13       A,       A1       55.0000       A         12       G♯/A♭,       G♯1/A♭1       51.9131       C         11       G,       G1       48.9994       C         10       F♯/G♭,       F♯1/G♭1       46.2493       C         9       F,       F1       43.6535       C         8       E,       E1       41.2034       E         7       D♯/E♭,       D♯1/E♭1       38.8909       C         6       D,       D1       36.7081       C         5       C♯/D♭,       C♯1/D♭1       34.6478       C         4       C, contra-octave       C1 Pedal C       32.7032       C         3       B,       B0       30.8677       B (5-string)         2       A♯,/B♭,,       A♯0/B♭0       29.1352	20	Е	E2	82.4069					Low E
17       C#/Db       C#2/Db2       69.2957         16       C great octave       C2 Deep C       65.4064       C         15       B,       B1       61.7354         14       A#/Bb,       A#1/Bb1       58.2705         13       A,       A1       55.0000       A         12       G#/Ab,       G#1/Ab1       51.9131         11       G,       G1       48.9994         10       F#/Gb,       F#1/Gb1       46.2493         9       F,       F1       43.6535         8       E,       E1       41.2034       E         7       D#/Eb,       D#1/Eb1       38.8909         6       D,       D1       36.7081         5       C#/Db,       C#1/Db1       34.6478         4       C, contra-octave       C1 Pedal C       32.7032         3       B,       B0       30.8677       B (5-string)         2       A#,/Bb,       A#0/Bb0       29.1352	19	D‡/E♭	D#2/Eb2	77.7817					
16       C great octave       C2 Deep C       65.4064       C         15       B,       B1       61.7354       B1         14       A#/Bb,       A#1/Bb1       58.2705       A         13       A,       A1       55.0000       A         12       G#/Ab,       G#1/Ab1       51.9131       A         11       G,       G1       48.9994       A         10       F#/Gb,       F#1/Gb1       46.2493       B         9       F,       F1       43.6535       E         8       E,       E1       41.2034       E         7       D#/Eb,       D#1/Eb1       38.8909       E         6       D,       D1       36.7081       D         5       C#/Db,       C#1/Db1       34.6478       B         4       C, contra-octave       C1 Pedal C       32.7032       B         3       B,       B0       30.8677       B (5-string)         2       A#,/Bb,       A#0/Bb0       29.1352       B	18	D	D2	73.4162				D	
15 B, B1 61.7354  14 A#/Bb, A#1/Bb1 58.2705  13 A, A1 55.0000 A  12 G#/Ab, G#1/Ab1 51.9131  11 G, G1 48.9994  10 F#/Gb, F#1/Gb1 46.2493  9 F, F1 43.6535  8 E, E1 41.2034 E  7 D#/Eb, D#1/Eb1 38.8909  6 D, D1 36.7081  5 C#/Db, C#1/Db1 34.6478  4 C, contra-octave C1 Pedal C 32.7032  3 B, B0 30.8677 B (5-string)  2 A#,/Bb, A#0/Bb0 29.1352	17	C#/Db	C#2/Db2	69.2957					
14       A#/Bb,       A#1/Bb1       58.2705         13       A,       A1       55.0000       A         12       G#/Ab,       G#1/Ab1       51.9131         11       G,       G1       48.9994         10       F#/Gb,       F#1/Gb1       46.2493         9       F,       F1       43.6535         8       E,       E1       41.2034       E         7       D#/Eb,       D#1/Eb1       38.8909         6       D,       D1       36.7081         5       C#/Db,       C#1/Db1       34.6478         4       C, contra-octave       C1 Pedal C       32.7032         3       B,       B0       30.8677       B (5-string)         2       A#,/Bb,,       A#0/Bb0       29.1352	16	C great octave	C2 Deep C	65.4064			С		
13       A,       A1       55.0000       A         12       G#/Ab,       G#1/Ab1       51.9131         11       G,       G1       48.9994         10       F#/Gb,       F#1/Gb1       46.2493         9       F,       F1       43.6535         8       E,       E1       41.2034       E         7       D#/Eb,       D#1/Eb1       38.8909         6       D,       D1       36.7081         5       C#/Db,       C#1/Db1       34.6478         4       C, contra-octave       C1 Pedal C       32.7032         3       B,       B0       30.8677       B (5-string)         2       A#,/Bb,       A#0/Bb0       29.1352	15	В,	B1	61.7354					
12	14	<b>Α</b> #/ <b>B</b> b,	A♯1/B♭1	58.2705					
11 G, G1 48.9994  10 F#/Gb, F#1/Gb1 46.2493  9 F, F1 43.6535  8 E, E1 41.2034 E  7 D#/Eb, D#1/Eb1 38.8909  6 D, D1 36.7081  5 C#/Db, C#1/Db1 34.6478  4 C, contra-octave C1 Pedal C 32.7032  3 B, B0 30.8677 B (5-string)  2 A#,/Bb,, A#0/Bb0 29.1352	13	Α,	A1	55.0000				A	
10 F#/Gb, F#1/Gb1 46.2493  9 F, F1 43.6535  8 E, E1 41.2034 E  7 D#/Eb, D#1/Eb1 38.8909  6 D, D1 36.7081  5 C#/Db, C#1/Db1 34.6478  4 C, contra-octave C1 Pedal C 32.7032  3 B, B0 30.8677 B (5-string)  2 A#,/Bb,, A#0/Bb0 29.1352	12	G♯/A♭,	G♯1/A♭1	51.9131					
9 F, F1 43.6535  8 E, E1 41.2034 E  7 D#/Eb, D#1/Eb1 38.8909  6 D, D1 36.7081  5 C#/Db, C#1/Db1 34.6478  4 C, contra-octave C1 Pedal C 32.7032  3 B, B0 30.8677 B (5-string)  2 A#,/Bb,, A#0/Bb0 29.1352	11	G,	G1	48.9994					
8       E,       E1       41.2034       E         7       D#/Eb,       D#1/Eb1       38.8909         6       D,       D1       36.7081         5       C#/Db,       C#1/Db1       34.6478         4       C, contra-octave       C1 Pedal C       32.7032         3       B,       B0       30.8677       B (5-string)         2       A#,/Bb,,       A#0/Bb0       29.1352	10	F#/Gb,	F♯1/G♭1	46.2493					
7       D#/Eb,       D#1/Eb1       38.8909         6       D,       D1       36.7081         5       C#/Db,       C#1/Db1       34.6478         4       C, contra-octave       C1 Pedal C       32.7032         3       B,       B0       30.8677       B (5-string)         2       A#,/Bb,,       A#0/Bb0       29.1352	9	F,	F1	43.6535					
6 D, D1 36.7081  5 C#/Db, C#1/Db1 34.6478  4 C, contra-octave C1 Pedal C 32.7032  3 B <sub>"</sub> B0 30.8677 B (5-string)  2 A# <sub>*</sub> /Bb <sub>"</sub> A#0/Bb0 29.1352	8	Ε,	E1	41.2034				Е	
5 C#/Db, C#1/Db1 34.6478  4 C, contra-octave C1 Pedal C 32.7032  3 B <sub>.</sub> , B0 30.8677 B (5-string)  2 A# <sub>.</sub> /Bb <sub>.</sub> , A#0/Bb0 29.1352	7	D#/Eb,	D#1/Εb1	38.8909					
4 C, contra-octave C1 Pedal C 32.7032  3 B,, B0 30.8677 B (5-string)  2 A#,/Bb,, A#0/Bb0 29.1352	6	D,	D1	36.7081					
3 B <sub>.,</sub> B0 30.8677 B (5-string) 2 A# <sub>.</sub> /Bb <sub>.,</sub> A# <sub>0</sub> /Bb0 29.1352	5	C#/Db,	C#1/Db1	34.6478					
2 A#,/Bb,, A#0/Bb0 29.1352	4	C, contra-octave	C1 Pedal C	32.7032					
	3	В"	В0	30.8677				B (5-string)	
1 A, sub-contra-octave A0 Double Pedal A 27.5000	2	Α‡,/Β♭,,	A#0/Βb0	29.1352					
	1	A,, sub-contra-octave	A0 Double Pedal A	27.5000					

#### **External links**

• interactive piano frequency table <sup>[1]</sup> — A php script allowing the reference pitch of A4 to be altered from 440 Hz.

• PySynth <sup>[2]</sup> — A simple Python-based software synthesizer that prints the key frequencies table and then creates a few demo songs based on that table.

#### **References**

- [1] http://shakahara.com/pianopitch2.php
- [2] http://home.arcor.de/mdoege/pysynth/

## **Article Sources and Contributors**

Piano key frequencies Source: http://en.wikipedia.org/w/index.php?oldid=474406100 Contributors: AJR, Alansohn, AndrewWTaylor, Antandrus, Binksternet, CQ, Cactuar12, Carboncopy, Chris Capoccia, Computer97, Cyndaquazy, Discospinster, Fuzzbox, Glenn L, H, Harrismdpilmpl, Highonlife, Hrdinský, Hydnjo, Joelthesecond, Just plain Bill, Kbdank71, Kenyon, Kieff, Kwamikagami, LMF5000, MDCollins, MakeRocketGoNow, Markmain, MatrixFrog, Matthew hk, Meithan, Melchoir, Missmarple, Modster, Morn, Noah Salzman, Nomenclator, Nono64, Obelix83, Prari, Princess Lirin, Prof. MagneStormix, Quinobi, Rainwarrior, Rigadoun, Supersoakerjim, TedE, Tem142857, Tlevine, Tuanglen, Unyoyega, Wahoofive, Woodstone, Xojo, Yamla, Zowie, 에 멜무지로, 72 anonymous edits

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