

Cello Standards: Fingerboard Pitch Frequencies (Hz)

-More often than not, these will be the pitch frequencies (Hz) of the 'Just Intonation Tuning System' used on the cello fingerboard.

-The numbers running vertically are comparable to a guitar fretboard. The prominent markers (tapes) on the cello identify shift positions:

- 1st position (2-4-5)
- 4th position (7-9-10)
- 8th position (14-16-17)
- Primary harmonics (12-19-24-28)

-Within each box [C#/Db], [D#/Eb], [F#/Gb], [G#/Ab], [A#/Bb], the top frequency is a #, and the bottom frequency is a b (ironically #'s are flatter than b's when using the Just Intonation Tuning System).

-Within the boxes representing [C], the top frequency is a Pythagorean C in relation to other open strings using a Perfect 5th ratio (3:2) based on "A" 220Hz (an octave below A440), and the bottom frequency is C in relation to C major.

-Within the box representing [E], the smaller frequency is a (minor 3rd/major 6th) in relation to the open G string, and the larger frequency is a (perfect 4th/5th) relation to an open A string.

-Using a tuner that displays exact pitch frequency will aid in improving intonation by training the musician to listen for harmonious, stable double stops.

-Note: Some notes are subject to a musician's ears particularly 3rds (e.g. "F#" 366.666Hz in D major may be too flat and should be something sharper like 368.8Hz).

-Musicians still must use their ear to fine tune the pitch frequencies with other ensemble players.

-Most cello fingerboards are different lengths. The fingerboard on my cello ends at about the "31st half step" ["fret" in guitar lingo].

To mark exact tape positions:

1. Tune all strings
2. Tune the double stops by ear
3. Check the pitch frequency on the tuner
4. Tune all string again between each marking.

Fret	D string	A string
2	E165	A220 (open string)
4	F#184.4	A220 (open string)
5	D146.666 (open string)	D293.333
7	A220	A220 (open string)
9	D146.666 (open string)	F#368.8
10	D146.666 (open string)	G391.111
12	D293.333	A220 (open string)
14	E330	A220 (open string)
16	F#368.8	A220 (open string)
17	D146.666 (open string)	D586.666
19	A440	A220 (open string)
24	D586.666	A220 (open string)
28	F#782.222	A220 (open string)

	C	G	D	A
0	65.184 66	97.777	146.666	220
	68.75 70.4	103.1 104.3	154.69 156.4	232.03 234.67
2 ●	73.333	110	162.9165	244.45 247.5
	77.34 78.2	116.02 117.3	176	260.738 264
4 ●	81.45 82.5	122.2 123.75	183.333 187.7	275 281.6
5 ●	88	130.369 132	195.555	293.333
	91.67 93.87	137.5 140.8	206.26 208.5	309.375 312.8
7	97.777	● 146.666	220	325.8 330
	103.1 104.3	154.69 156.4	232.03 234.67	352
9	110	● 162.9165	244.45 247.5	366.666 375.5
10	116.02 117.3	● 176	260.738 264	391.111
	122.2 123.75	183.333 187.7	275 281.6	412.5 417.18
12	130.369 132	195.555	● 293.333	440
	137.5 140.8	206.26 208.5	309.375 312.8	458.34 469.3
14	146.666	● 220	325.8 330	488.9 495
	154.69 156.4	232.03 234.67	352	521.5 528
16	162.9165	● 244.45	366.666 375.5	550 563.2
17	176	● 260.738	391.111	586.666
	183.333 187.7	275 281.6	412.5 417.18	618.75 625.8
19	195.555	293.333	● 440	651.86 660
	206.26 208.5	309.375 312.8	458.34 469.3	704
21	220	325.8 330	488.9 495	733.333 750.9
	232.03 234.67	352	521.5 528	782.222
23	244.45 247.5	366.666 375.5	550 563.2	825 834.37
24	260.738 264	391.111	● 586.666	880
	275 281.6	412.5 417.18	618.75 625.8	928.125 938.67
26	293.333	440	651.86 660	977.8 990
	309.375 312.8	458.34 469.3	704	1042.97
28	325.8 330	488.9 495	● 733.333	1100 1125.4
	352	521.5 528	782.222	1173.3
	366.666 375.5	550 563.2	825 834.37	1237.5 1251.66
31	391.111	586.666	○ 880	1303.7 1320
	412.5 417.18	618.75 625.8	928.125 938.67	1408
	440	651.86 660	977.8 990	1466.7 1501.87
34	458.34 469.3	704	○ 1042.97	1564.4
	488.9 495	733.333 750.9	1100 1125.4	1650 1668.74
36	521.5 528	782.222	○ 1173.3	1760