

Math/Music: Structure and Form

Understanding Musical Intervals

In general, two notes are considered an *n*th interval apart if they are *n* steps apart on the staff. Be sure to include the location of each note when counting steps on the staff. For example, an F and an A are a **third** apart since there are three steps between them. (You count the bottom space for F, the second from bottom line for G and the second from bottom space for A.) Mathematically speaking this is quite annoying since you really move up two notes on the piano to get from an F to an A — so shouldn't it be called a second? No, musically it is a third. Equally annoying is the fact that intervals don't combine the way you would expect. For example, going up a third and then a fourth is equivalent to a sixth, not a seventh!

In addition to the number of the interval, there is also the designation of **perfect, major or minor**. Perfect and major designations are for intervals in the major scale. Specifically, if you were to build a major scale starting on the bottom note, and the top note is included in that scale, then the interval is perfect (in the case of the 4th or 5th) or it is major. On the other hand, if the interval is not in the major scale (when starting on the bottom note), then we call it minor.

Scale Degree	Solfege	Interval	# of Half Steps	Name	Musical Example
1	Do	unison (Uni.)	0	<u>Tonic</u>	
2	Re	major second (M2)	2	Supertonic	<i>Happy birthday</i>
3	Mi	major third (M3)	4	Mediant	<i>Kumbayah</i>
4	Fa	perfect fourth (P4)	5	<u>Subdominant</u>	<i>HC alma mater, Here comes the bride</i>
5	Sol	perfect fifth (P5)	7	<u>Dominant</u>	<i>Twinkle Twinkle</i>
6	La	major sixth (M6)	9	Submediant	<i>It came upon a midnight clear</i>
7	Ti	major seventh (M7)	11	<u>Leading tone</u>	<i>Take on me</i>
8 = 1	Do	octave (Oct.)	12	<u>Octave</u>	<i>Somewhere over the rainbow</i>

Table 1: Major Intervals

Notes	Interval	# of Half Steps	Musical Example
C - D \flat	minor second (m2)	1	<i>Jaws</i>
C - E \flat	minor third (m3)	3	<i>Air-ball!</i> (heckle interval)
C - F \sharp	<u>tritone</u> (Tri.)	6	<i>Maria</i>
C - A \flat	minor sixth (m6)	8	<i>Theme from Love Story</i>
C - B \flat	minor seventh (m7)	10	<i>There's a place for us</i>

Table 2: Minor Intervals

Typically, pieces in a major key or that feature mostly major and perfect intervals sound “happy,” while those in a minor key and featuring minor intervals are “sad.” However, this is hardly a universal rule of music, as there are certainly many exceptions.