

Ear Training Fundamentals: Introduction and Ascending Diatonic Intervals

Introduction

This lesson is an introduction to ear training for performance and transcription purposes. While beneficial for those seeking to develop the skills to “play by ear,” this curriculum delves deeper, enabling the student to effectively transcribe or sight-read a melody without the aid of an instrument. This is the first of a four part series on melodic interval recognition. Reading notation is not an essential skill for this series, but it is encouraged and is a significant aid in the application of this material.

The Basic Concepts

Pitch is one of the primary aspects of any music. Distances between pitches are referred to as intervals. Intervals may either be melodic or harmonic. Melodic refers to the relationship between pitches heard sequentially, while harmonic refers to pitches heard simultaneously. These lessons focus on developing the ability to differentiate, recognize, and produce specific melodic intervals. Additionally, learning appropriate nomenclature and categories helps to develop an applicable connection between the ear, the theory, and the musical product.

Types of Intervals

There are two components involved in the identification of any interval: the quality and the distance, as indicated by number. Both the quality and distance are necessary to accurately describe a particular interval. Again, the naming convention is itself instructive and descriptive, allowing easier application of the theory to the practice.

There are five intervallic qualities in Western music. These are perfect, major, minor, diminished, and augmented. The quality is used as a modifier to the interval number.

The number of the distance between pitches in reference to diatonic scale degrees (numbered 1-8, each numeral designating a scale degree). For instance, the C major diatonic scale is C D E F G A B C', or in degrees, 1 2 3 4 5 6 7 8 (1'). The distance from C to D is a second, from C to F a fourth, from C to B a seventh, and so on. Any intervals consisting of C to any kind of D (D, Db, D#) is a second. This is where the quality becomes essential.

Determining Interval Quality

There are a number of ways to theoretically deduce the quality of an interval. These include counting the number of semi-tones (the smallest interval in Western music, equivalent to one fret) between pitches and through referencing the intervals of the major diatonic scale. Both are outlined here.

When counting semi-tones, note that there are 12 semi-tones per octave (the chromatic scale). One limitation of the semi-tone method for determining intervals is that it does not distinguish between enharmonic intervals. Enharmonic refers to identical sounds with different names, due to a distinction in perceived function (e.g., C#=Db or augmented fifth=minor sixth). The following chart illustrates the correlation between the distance in pitches, semi-tones, and interval quality/number. Note: Intervals in green are common to both major and minor diatonic scales, those in yellow are specific to the major diatonic, and those in purple are specific to the minor diatonic. All other intervals are non-diatonic to major and minor keys.

Distance in Pitch	Distance in Semi-Tones	Interval Quality/Number
C-C	0	Perfect Unison
C-C# / C-Db	1	Minor Second
C-D	2	Major Second
C-D# / C-Eb	3	Augmented Second/Minor Third
C-E	4	Major Third
C-F	5	Perfect Fourth
C-F# / C-Gb	6	Augmented Fourth/Diminished Fifth (aka Tritone)
C-G	7	Perfect Fifth
C-G# / C-Ab	8	Augmented Fifth/Minor Sixth
C-A	9	Major Sixth
C-A# / C-Bb	10	Augmented Sixth/Minor Seventh
C-B	11	Major Seventh
C-C	12	Perfect Octave

The second method requires familiarity with the major diatonic scale, but may prove to be more immediately applicable. In the major diatonic scale, the unison, octave, fourth, and fifth are always perfect in quality. The second, third, sixth, and seventh are all major intervals. All of the numbers are accounted for, and the quality is determined relative to the quality of each degree in the diatonic major scale. The chart below demonstrates these same relationships as the table above, but using scalar degrees instead of number of semi-tones.

Distance in Pitch	Relationship in Scalar Degrees/ number	Interval Quality/Number
C-C	1	Perfect Unison
C-C# / C-Db	b2	Minor Second
C-D	2	Major Second
C-D# / C-Eb	+2 / b3	Augmented Second/Minor Third
C-E	3	Major Third

C-F	4	Perfect Fourth
C-F# / C-Gb	+4 / dim 5	Augmented Fourth/Diminished Fifth (aka Tritone)
C-G	5	Perfect Fifth
C-G# / C-Ab	+5 / b6	Augmented Fifth/Minor Sixth
C-A	6	Major Sixth
C-A# / C-Bb	+6 / b7	Augmented Sixth/Minor Seventh
C-B	7	Major Seventh
C-C'	8 / (1)	Perfect Octave

Interval Inversion

Interval inversion refers to switching the voicing of two notes in an interval. For instance, if our notes are C and the G note seven semi-tones higher, we have a perfect fifth. However, if we invert it, by shifting the G down one octave, the interval is now a perfect fourth.

The relationship between any two notes can be inverted. The interval is named depending upon the distance from the lower pitch note to the higher pitch. However, inversions are simple to calculate by applying simple rules to the interval distance and quality. These are shown in the chart below.

Interval Distance	Inversion
Unison	Octave
Second	Seventh
Third	Sixth
Fourth	Fifth
Sixth	Third
Seventh	Second
Octave	Unison
Interval Quality	Inversion
Perfect	Perfect
Major	Minor
Minor	Major
Augmented	Diminished
Diminished	Augmented

When an interval is inverted, both the distance and quality are affected. For example, using C-G (ascending 7 semi-tones) as an example, our original interval is a Perfect Fifth. If we shift the G down one octave the distance inverts to a fourth and the quality remains perfect. As a second example, a minor third using the notes A-C inverts

to a major sixth, affecting both the quality and distance. All intervals are subject to inversion. These relationships are shown on the chart above.

For our purposes, the interval inversions are used when referring to descending intervals. This will be reviewed in future lessons when applicable.

Approach to Ear Training

The first step in developing the ear is to learn to distinguish different intervals. The method used here utilizes mnemonic devices to aid in remembering the specific sound of each interval. These devices are drawn from well-known tunes, ideally with the interval occurring between the first two notes, when possible. By associating an interval with a tune, it becomes much easier to recall the sound of an interval by singing or humming the appropriate phrase.

It is also important to organize the material as you begin to develop interval recognition. Simple parameters are diatonic intervals in major key, ascending and descending. Focus first on the ascending intervals, and once these are mastered, begin with descending intervals. Once these are successfully internalized, move on to the non-diatonic intervals, first in ascent, and then descending.

Also, it's important to begin with a fixed tonic note, in this case C. This provides a common reference point for all of the intervals. After learning all of the intervals from a fixed root, go back and practice them with a randomly selected moveable tonic.

Finally, to truly retain the sounds, and for application in composition or improvisation, it is not sufficient to merely recognize the intervals. To fully master this subject, it's essential to be able to accurately produce each interval with your voice, from both fixed and moveable positions. It is not necessary to be a singer, or to be particularly concerned with voice production, but it is important to be able to recall and produce the sound of any interval without external stimuli.

Ascending Major Diatonic Intervals

Here are the tunes in the video corresponding to each interval in the ascending diatonic major scale:

Major Second – “You Are My Sunshine”

Major Third – “Do-Re-Mi (refrain)” from *The Sound of Music*

Perfect Fourth – “Simple Gifts”

Perfect Fifth – “Star Wars” theme

Major Sixth – “Jingle Bells”

Major Seventh – “Raindrops Keep Falling on My Head”

Octave – “Over the Rainbow”

The program outlined here is a long-term course of study. Ear development occurs at different rates for different people. Each step in this plan may take one week or longer to complete. If the initial parameters of recognizing the intervals of the major diatonic scale are too challenging, begin by learning the perfect intervals. Then, move onto adding the majors and minors. The idea is to slowly build a reliable connection between the ear, the theoretical knowledge, and ultimately, your instrument. This is an extended process, but all progress is invaluable.