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Music Theory Fundamentals
High-Yield Music Theory, vol. 1

Mark Feezell
LearnMusicTheory.net
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Foreword:

What is High-Yield Music Theory?

Philosophy

The core principles guiding high-yield music theory are:
1. Assume no prior knowledge.
2. Build one concept at a time.
3. Get to the POINT!

Volumes

The latest editions of this study reference are available at LearnMusicTheory.net. Eventually there will be multiple volumes, covering Music Theory Fundamentals; Harmony; Jazz, Pop, and Contemporary Music Theory (including Twentieth-Century Music); and Form in Music.

Format

The format for each volume is consistent:
1. The left column lists terms to help you organize your study and find topics quickly.
2. Bold indicates key concepts.
3. Each volume ends with a Remember-Forever Review and More Resources.

Students: how to use this guide

Students can…
...read it before or after your primary text for a music theory course.
...use it as an efficient review before entrance exams, barriers, etc.
...use it as a theory reference book by looking up terms in the index.
...use it to quiz or tutor your fellow students.
...check out the great resources listed under “More Resources.”

Teachers: how to use this guide

Teachers can…
...use it as a class lecture outline along with your favorite theory text.
...use it as a review guide after presenting the material with your favorite text.
...use the Remember-Forever Review section before final exams.
...require students to purchase one or more volumes for extra study.
...use it as a primary textbook alongside your favorite workbook or music anthology.
Chapter 1

Music Notation

1.1 Staves and Clefs: elements of music, staff, note names, clef, treble clef, bass clef, ledger lines, grand staff, C clefs, alto clef, tenor clef

1.2 The Chromatic Scale and the Piano: piano keyboard diagram, pattern of piano keyboard, half step, accidentals, whole step, natural half steps, enharmonic notes, scale, chromatic scale

1.3 All About Octaves: octave, middle C, ledger lines between the staves, American Standard octave designations, Helmholtz octave designations, ottava, quindicesima, octave clef

1.4 Rhythmic Values: duration, rhythmic value, rhythm, notehead, stems, flags, beams, rests, ties, augmentation dots, double-dotted notes

1.5 Time Signatures in Simple Meter: beat, measure, bar, barline, time signature, beat unit, simple time signature, duple, triple, quadruple, beat division and subdivision, cut time, alla breve, common time, anacrusis, downbeat, strong beat, weak beat, stress patterns

1.6 Compound and Asymmetric Meter: compound time signatures, tempo and meter, asymmetric time signatures, anacrusis and stress patterns in compound meter, summary of time signatures

1.7 Tuplets/Grouplets: tuplets, grouplets, triplets, quintuplets, sextuplets, septuplets, brackets, duplets and quadruplets (compound time signatures), duplets and quadruplets as dotted values

1.8 Repeat Signs and Repeated Sections: simple repeats, first and second endings, D.C. al fine, D.S. al coda, D.S. al fine, D.C. al coda, repeated beat, repeated measure, two-measure repeat

1.9 Dynamics, Articulations, Slurs, Tempo Markings: dynamics, articulations, slurs, bowings, fermatas, breath marks, caesura/grand pause, crescendo, diminuendo, decrescendo, tempo, BPM, M.M., Italian tempo indications

1.10 Summary of Notation Guidelines: staves, system, clefs, noteheads, accidentals, stems, beams, rhythm and meter, key signatures
Section 1.1  
STAVES AND CLEFS

Elements of music  
The fundamental elements of music are pitch (the highness/lowness of the notes), duration (how long the notes last), timbre (overall type of sound such as trumpet versus clarinet), and dynamics/loudness. Some authors add frequency (the speed of the physical vibration making the sound) and texture (see 5.1 Texture in Music).

Staff  
A staff (plural: staves) uses five parallel lines to notate (write down) the pitch aspect of music. Higher-pitched notes are written higher on the staff. Staff lines are numbered 1 to 5, starting from the bottom line. Note names from low to high are the letters A, B, C, D, E, F, G, then repeating A, B, C…

Note names  
Every Good Boy Does Fine  
F-A-C-E spells face

Clef  
A clef indicates which note names go on which lines (and spaces between the lines) on the staff. Clefs are written at the start of the staff. Treble clef designates the second line from the bottom as G. The lines in treble clef represent the pitches E, G, B, D, and F. The spaces are F, A, C, and E.

Treble clef  
F, so...

Bass clef  
Bass clef designates the fourth line from the bottom as F. The lines in bass clef represent the pitches G, B, D, F, and A. The spaces are A, C, E, and G.
Chapter 1: Music Notation

Ledger lines

Ledger lines are small lines that extend the staff higher and lower. They can be used with any clef. Ledger lines belong to a single note; they never connect to ledger lines for surrounding notes.

A grand staff is a treble clef staff and bass clef staff connected with a brace. Piano music uses a grand staff, along with instruments such as harp and marimba. Sometimes vocal (choir) music is also notated using a grand staff.

C clefs

All C clefs indicate where C is on the staff. Alto clef is a C clef centered on the third line from the bottom, designating it as C. Parts for the viola (a string instrument in the violin family) almost always use alto clef.

Tenor Clef

Tenor clef is a C clef centered on the fourth line from the bottom, designating it as C. Bassoon and trombone music occasionally uses tenor clef, although both instruments more commonly read bass clef.
**Section 1.2**

**THE CHROMATIC SCALE AND THE PIANO**

**Pattern of the piano keyboard**

This section uses the piano, but the concepts apply to other instruments and voice also. The piano repeats a pattern: groups of two black keys alternate with groups of three. Every white key just to the left of a group of two black keys is labeled as C. After G, the letter names start over with A.

<table>
<thead>
<tr>
<th>2 black keys</th>
<th>3 black keys</th>
<th>2 black keys</th>
<th>3 black keys</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
</tr>
<tr>
<td>F</td>
<td>G</td>
<td>A</td>
<td>B</td>
</tr>
<tr>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
</tr>
<tr>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
</tr>
</tbody>
</table>

**Half step**

A **half step** is the distance from one piano key to the next closest (whether it happens to be white or black). E to F is a half step, because E and F are next to one another. Similarly, B to C is a half step. E to F and B to C are the only **natural half steps** because they use letter names without accidentals.

**Accidentals**

The black keys use the letter of an adjacent white key plus a modifier called an **accidental**. The most common accidentals are:

1. $b = $flat; one half step **lower than** (left of) a white key
2. $§ = $natural; cancels other accidentals; indicates white notes on a piano
3. $# = $sharp; one half step **higher than** (right of) a white key

**Enharmonic notes**

**Enharmonic notes** are different names for the same piano key. For example, the black key called C sharp is one half step above C, but also one half step below D. C sharp is **enharmonic** with D flat. White keys also have enharmonic names: B raised one half step with a sharp is the white key C.
Double flat

A double flat lowers a flat note by another half step, keeping the same letter name. Double flats are thus two half steps lower than the white key (natural) note. Similarly, a double sharp (looks like an x) raises a sharp note by another half step, keeping the same letter name. Double sharps are two half steps higher than the white key (natural) note.

All enharmonics

The piano keyboard below shows all the enharmonic names for the keys.

Whole step

A whole step is two half steps. For instance, for C up to D, the two half steps are C to C♯ and C♯ to D.

Scale

A scale (from the Italian word for ladder) is a series of notes from low to high (or high to low) following some pattern of whole steps and half steps.

Chromatic scale

A chromatic scale lists all the notes (white and black keys) in order, usually from C to the next C above or below. Chromatic scales use only half steps. Ascending chromatic scales use sharps for black piano keys. Descending chromatic scales use flats for black piano keys.
Section 1.3

All About Octaves

Octave

An octave is the distance from a note up or down to the next note with the same name. For example, from the pitch A up to the next A is one octave. Octaves span eight letter names: A-B-C-D-E-F-G-A = 1-2-3-4-5-6-7-8.

Middle C

Middle C is the C just to the left of center on the piano keyboard; it is near the “middle” of the piano. In treble clef, middle C is one ledger line below the staff. In bass clef, middle C is one ledger line above the staff. On C clefs, including alto clef and tenor clef, middle C is at the center of the clef sign. All of the notes below represent exactly the same piano key (middle C).

Middle C on the grand staff

In a grand staff, middle C is notated differently depending on whether it is in the treble or bass clef. Middle C is literally the “middle” ledger line, one line below the treble clef and one line above the bass clef.

Ledger lines between the staves

Ledger lines may occur between the staves to make it clear whether the notes are in the treble clef (or right hand) part or bass clef (left hand) part.
In American Standard (or Scientific) Pitch Notation, the octaves are numbered, with middle C being C4. Every C begins a new octave number, so the B just below C4 is B3, and the D just above C4 is D4. Accidentals don’t change the octave; B#4 = C5, and C♭5 = B4.

Helmholtz pitch notation is used widely in Europe and older science publications. Middle C is c’ (read “one-line C”). Octaves are C,,, (“subcontra C”); C, (“contra C”); C (“great C”); c (“small C”); c’ (“one-line C” = Middle C); c” (“two-line C”); c’’ (“three-line C”); and c’’’ (“four-line C”).

The ottava symbol (8va) raises a note by one octave, while the ottava bassa (8vb) lowers a note by one octave. Ottava always appears above the staff, and ottava bassa appears below the staff. Similarly, quindicesima (15ma) raises a note two octaves; quindicesima bassa lowers a note two octaves.

The octave clef lowers the music an octave; it is often used for tenor voice.
Section 1.4

RHYTHMIC VALUES

Duration
Rhythmic value
Rhythm

Rhythmic values indicate relative duration, not absolute duration. Each rhythmic value is half the duration of the next longer value. Shorter note values (64th notes, etc.) are also possible.

Notehead
Stems
Flags
Beams

The oval part of the note is called the notehead. Notes shorter than whole notes have a stem attached to the notehead. Notes shorter than quarters have flags or beams, depending on the rhythmic context (see 1.10 Summary of Notation Guidelines). Eighth notes have one flag (or beam), sixteenth notes have two flags (or two beams), and so on. The position of the notehead on the staff indicates the pitch of the note.

(2 eighth notes with flags) = (2 eighth notes beamed together)
Rests  
**Rests** are similar to notes, but indicate **lengths of silences**. A breve rest is twice as long as a whole rest, a whole rest is twice as long as a half rest, and so on. Remember that a whole note looks like a “hole” in the ground.

<table>
<thead>
<tr>
<th>breve</th>
<th>whole</th>
<th>half</th>
<th>quarter</th>
<th>eighth</th>
<th>sixteenth</th>
<th>thirty-second</th>
</tr>
</thead>
</table>

Ties  
**Tie** combines rhythmic values together. For example, two eighth notes tied together make a rhythmic value equal to one quarter note. Ties connect notes of the **same pitch**. Ties never connect rests.

\[
\overset{\text{Tie}}{\text{\textbullet\textbullet}} = \overset{\text{\textbullet}}{\text{\textbullet}} \quad \text{and} \quad \overset{\text{Tie}}{\text{\textbullet\textbullet\textbullet\textbullet}} = \overset{\text{\textbullet}}{\text{\textbullet}} \quad \text{and} \quad \overset{\text{Tie}}{\text{\textbullet\textbullet\textbullet\textbullet\textbullet\textbullet\textbullet}} = \overset{\text{\textbullet}}{\text{\textbullet}} \quad \text{etc.}
\]

Augmentation dots (dotted rhythmic values)  
An **augmentation dot** on any note or rest adds half the duration. The rhythmic value is said to be “**dotted**.” For example, a dotted half note equals a half note plus a quarter note, since a quarter note is half of a half note. Similarly, a dotted quarter note equals a quarter note plus an eighth note, since an eighth note is half of a quarter note.

\[
\overset{\text{\textbullet}}{\text{\textbullet}} \quad \text{(dotted half note)} = \overset{\text{\textbullet}}{\text{\textbullet}} + \overset{\text{\textbullet}}{\text{\textbullet}} = \overset{\text{\textbullet}}{\text{\textbullet}} + \overset{\text{\textbullet}}{\text{\textbullet}} + \overset{\text{\textbullet}}{\text{\textbullet}} \\
\overset{\text{\textbullet}}{\text{\textbullet}} \quad \text{(dotted quarter note)} = \overset{\text{\textbullet}}{\text{\textbullet}} + \overset{\text{\textbullet}}{\text{\textbullet}} = \overset{\text{\textbullet}}{\text{\textbullet}} + \overset{\text{\textbullet}}{\text{\textbullet}} + \overset{\text{\textbullet}}{\text{\textbullet}}
\]

Double-dotted notes  
A **second augmentation dot** (if present), adds half the first dot’s value. Rhythmic values with two dots are **“double-dotted.”** For example, a double-dotted half note equals a half note plus a quarter note (for the first dot) plus an eighth note (half of a quarter note, for the second dot). Double-dotted notes are 1.75 times as long (1+0.5+0.25) as the undotted value.

\[
\overset{\text{\textbullet\textbullet}}{\text{\textbullet}} \quad \text{(double-dotted half note)} = \overset{\text{\textbullet}}{\text{\textbullet}} + \overset{\text{\textbullet}}{\text{\textbullet}} + \overset{\text{\textbullet}}{\text{\textbullet}} \\
\overset{\text{\textbullet\textbullet}}{\text{\textbullet}} \quad \text{(double-dotted quarter note)} = \overset{\text{\textbullet}}{\text{\textbullet}} + \overset{\text{\textbullet}}{\text{\textbullet}} + \overset{\text{\textbullet}}{\text{\textbullet}}
\]
Section 1.5

**TIME SIGNATURES IN SIMPLE METER**

**Beat**
A beat is a repeating musical pulse. Listeners sense the beat when they tap their feet or clap their hands in time with the music. Musicians group beats into units called measures or bars. Every measure ends with a barline. A special final barline indicates the end of the movement or piece.

**Measure**

**Bar, Barline**

**Final barline**

A time signature (or meter signature) indicates how many beats there are in one measure and what rhythmic value gets one beat (this value is called the beat unit). For time signatures in simple meter, the top number is the number of beats in each measure, and the bottom number is the beat unit. Time signatures are not fractions, so there is no line between the numbers.

**Duple, Triple, Quadruple**

Meters (that is, time signatures) with two beats per measure are duple, those with three beats are triple, and those with four beats are quadruple.

**Beat division and subdivision**

Each beat in simple meter divides into two equal beat divisions, or four equal beat subdivisions. Below, one quarter note beat equals two eighth notes or four sixteenth notes; see 1.4 Rhythmic Values.
### Other beat units

The bottom number in a simple time signature indicates the **beat unit**: two means half note, four means quarter, eight means eighth, and so on. The first time signature below is also called **cut time** or **alla breve**. The second time signature is common in Baroque music; sometimes the eighth notes are written with flags instead of beamed together. The last time signature is sometimes called **common time**.

<table>
<thead>
<tr>
<th>Time Signature</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>2 beats</td>
</tr>
<tr>
<td>3</td>
<td>3 beats</td>
</tr>
<tr>
<td>4</td>
<td>4 beats</td>
</tr>
</tbody>
</table>

### Cut time

### Alla breve

### Common time

### Anacrusis (pickup measure)

An anacrusis is a partial measure that begins some pieces. An anacrusis is often one beat long, but not always. If there is an anacrusis, the final measure will be shortened so that the anacrusis and the final, shortened measure together equal the length of one regular measure.

### Downbeat

The **downbeat** is the first beat of each measure. The downbeat is fundamental and stable (a **strong beat**) because it initiates each new group of beats. The last beat of each measure is unstable (a **weak beat**) because it pulls forward to the following measure. The last beat of a measure often seems to have more energy than the downbeat, because it propels the rhythm forward to the more stable, stronger downbeat.

### Stress patterns

The following stress patterns for beats are common:

1. **Duple meters**: Meters with two beats follow a **STRONG-weak** stress pattern for the two beats.
2. **Triple meters**: Meters with three beats follow a **STRONG-weak-weak** stress pattern for the three beats.
3. **Quadruple meters**: Meters with four beats follow a **STRONGEST-weak-STRONG-weak** pattern for the four beats.
Section 1.6

**Compound and Asymmetric Meter**

**Compound time signatures**

Beats in compound time signatures divide into three division notes, not two. The top number indicates the number of division notes per measure. The bottom number indicates the division rhythmic value (not the beat unit). It takes three division notes (not two) to make one beat.

![Diagram of compound time signature](image)

\[ \frac{1}{3} \text{ beat} = \frac{1}{6} + \frac{1}{6} + \frac{1}{6} = \frac{1}{2} \text{ (Duple)} \]

**Decoding compound time signatures**

A time signature with 6, 9, 12, or 15 on top is compound. To get the number of beats, divide the top number by three. The beat unit is a dotted rhythmic value one larger than the bottom number; sixteen on the bottom means a dotted-eighth beat unit, eight on the bottom means a dotted quarter, and so on. Compound time signatures can be duple, triple, quadruple, or even quintuple (five beats).

![Diagram of compound time signature](image)

\[ \frac{9}{16} = 9 \text{ division notes} \]
\[ \frac{12}{8} = \frac{1}{4} \text{ is division of beat} \]
\[ \frac{1}{3} \text{ beat} = \frac{1}{16} + \frac{1}{16} + \frac{1}{16} = \frac{1}{4} \text{ (Quadruple)} \]

**Tempo and Meter**

Sometimes tempo can make a normally compound time signature into a simple time signature, or a normally simple time signature into a compound one. This is especially common if the top number is six or three.

![Diagram of tempo and meter](image)

\[ \frac{6}{4} = 6 \text{ division notes (2 beats)} \]
\[ \frac{1}{3} \text{ beat} = \frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{1}{2} \text{ (Compound Duple)} \]
\[ \frac{6}{4} = 6 \text{ beats} \]
\[ \frac{1}{4} \text{ is beat unit} \]

Simple Sextuple
Asymmetric time signatures have a mixture of two and three-part beat divisions. The top number indicates the number of division notes per measure (often 5, 7, or 11, but varies). The bottom number indicates the division rhythmic value (not the beat unit). The beaming indicates beat groupings for individual beats.

For time signatures in asymmetric meter, beats with three division notes will be longer than beats with two division notes. The length of the division note value, not the beat, must remain constant. In the left example below, the eighth note pulse remains constant, while in the right example the quarter note pulse remains constant. See 1.7 Tuplets/Grouplets for an explanation of the triplets in the right example.

Music in compound meter may also include an anacrusis. If so, the last measure will be shortened by the amount of the anacrusis, as in simple meter. Stress patterns for duple, triple, and quadruple compound time signatures match those given at the end of 1.5 Time Signatures in Simple Meter.

Simple time signatures are simple: the top number is the number of beats, and the bottom is the beat unit. Compound time signatures nearly always have 6, 9, 12, or 15 on top, indicating the number of division notes; the bottom number indicates the division rhythmic value. Asymmetric signatures have beats with unequal lengths. Like compound time signatures, asymmetric time signatures indicate the rhythmic value for one beat division, not the beat unit.
Section 1.7

Tuplets/Grouplets

Tuplets The standard rhythmic values divide into 2 parts, then 4 parts, then 8 parts, and so on (see 1.4 Rhythmic Values). Tuplets (also called grouplets) fill in the gaps between these ratios. The word tuplets may be pronounced “tuplets” or “tooplets.”

Triples Triples divide a rhythmic value into three equal parts, rather than two or four. The triplet uses the rhythmic value for a two-part division, the next longer duration. In the example below, the eighth note (a two-part division) is the next longer duration, so the triplet uses eighth notes.

\[
\begin{align*}
\text{quarter note} & \rightarrow 2 \text{ parts} & \rightarrow \text{triplet} & \rightarrow 4 \text{ parts} \\
\end{align*}
\]

Quintuplets In simple time signatures (see 1.5 Simple Meter), tuplets/grouplets always use the next longer rhythmic value. Quintuplets (five equal parts), sextuplets (six equal parts), and septuplets (seven equal parts) all use the rhythmic value for a four-part division.

Tuplet brackets Tuplet brackets should be used with the number on the notehead side when there isn’t a beam (half notes, quarter notes, whole notes). Only tuplets that use half note and quarter note rhythmic values in the example above have brackets.
### Duplets and quadruplets (compound time signatures)

In compound time signatures (see 1.6 Compound and Asymmetric Meter), **duplets** and **quadruplets** look like the corresponding simple meter beat division.

**Duplets:**
\[
\begin{array}{c}
\text{Duplets:} \\
\frac{\text{beat unit}}{2} \\
\frac{\text{beat unit}}{2}
\end{array}
\]

**Quadruplets:**
\[
\begin{array}{c}
\text{Quadruplets:} \\
\frac{\text{beat unit}}{4} \\
\frac{\text{beat unit}}{4}
\end{array}
\]

### Duplets and quadruplets as dotted values

**Duplets** and **quadruplets** in compound time signatures may also be notated as ordinary dotted rhythmic values. In the example below, six sixteenths per beat divided into **two** halves gives **three** sixteenths for each half of the beat.

\[
\begin{array}{c}
\text{Groups of 3 tied sixteenths} \\
\text{= dotted eighths} \\
\text{= duplet eighths}
\end{array}
\]

### Nonstandard tuplets

**Nonstandard tuplets** or tuplets that may be unclear are sometimes indicated with an explicit ratio. Extremely rarely, tuplets may also be nested.

\[
\begin{array}{c}
\text{5:4 = 5 in the space normally taken by 4} \\
\text{OR showing the rhythmic value (5:4):}
\end{array}
\]
Section 1.8

**REPEAT SIGNS AND REPEATED SECTIONS**

**Simple repeats**  The *end repeat sign* tells the performer to go back one time to the *start repeat sign*, or, if there is no start repeat, the beginning of the movement.

```
start repeat sign   end repeat sign
```

**1st and 2nd endings**  First and second endings indicate different music to be played the first and second times. “2x only” (not shown below) means play that music the second time only. Third and higher endings are also possible.

```
[1.]
```

**D.C. al fine (Da capo al fine)**  D.C. (da capo, “from the head”) means repeat back to the start of the piece. Al fine means after repeating back, play to the fine marking. Traditionally, musicians skip over any first endings after they go back for a D.C. (or D.S.) repeat. The numbers in the example below indicate: (1) play through the first ending; (2) repeat back to measure 1; (3) jump to the second ending; (4) play to the last written measure; 5) D.C. to the “head” (start); and (6)/(7)/(8) play through to the Fine, skipping any first endings and stopping at the end of the measure with the Fine marking.

```
[1.]
```
**D.S. al coda**

D.S. *(dal segno)* means repeat back to a special sign (see example below; segno means sign) and *al coda* means after repeating back, play to the coda mark, then jump to the coda (coda means tail). The numbers in the example below indicate: (1) play from the start to the D.S. al coda break; (2) repeat back to the sign (dal segno); (3) play until the “jump to coda” symbol; and (4)/(5) jump to the coda and play to the end. **D.S. al fine** (not al coda) and **D.C. al coda** (not al fine) are also common possibilities.

---

**Dal segno al coda**

---

**D.S. al fine**

**D.C. al coda**

---

**Repeated beat**

The *repeated beat symbol* is used only in handwritten music and parts for rhythm instruments such as guitar, drums, or sometimes piano.

---

**Repeated measure**

The *repeated measure/bar* is used only for drums, piano, or guitar.

---

**Two-measure repeat**

The *two-measure repeat* is used only for drums, piano, or guitar. Four-measure repeats are also possible; they use four slashes and the number four, not two. To repeat more than four measures, use a simple repeat sign.
Section 1.9  
DYNAMICS, ARTICULATIONS, SLURS, TEMPO MARKINGS

Dynamics  
Dynamics are used to indicate relative loudness:
- \( ppp = \text{pianississimo} \) = very, very soft
- \( pp = \text{pianissimo} \) = very soft
- \( p = \text{piano} \) = soft
- \( mp = \text{mezzo-piano} \) = medium-soft
- \( mf = \text{mezzo-forte} \) = medium-loud
- \( f = \text{forte} \) = loud
- \( ff = \text{fortissimo} \) = very loud
- \( fff = \text{fortississimo} \) = very, very loud
- \( fp = \text{forte followed suddenly by piano} \); also \( mfp, ffp \), etc.
- \( sfz = \text{sforzando} \) = a forceful, sudden accent
- \( fz = \text{forceful but not as sudden as sfz} \)

Articulations  
Articulations specify how notes should be performed, either in terms of duration or stress. \( \text{Staccattissimo} \) means extremely shortened duration. \( \text{Staccato} \) means shortened duration. \( \text{Tenuto} \) has two functions: it can mean full duration OR a slight stress or emphasis. \( \text{Accent} \) means stressed or emphasized (more than \( \text{tenuto} \)). \( \text{Marcato} \) means extremely stressed. An articulation of duration (\( \text{staccattissimo}, \text{staccato}, \) or \( \text{tenuto} \)) may combine with one of stress (\( \text{tenuto}, \text{accent}, \) or \( \text{marcato} \)).

Slurs  
Slurs are curved lines connecting different pitches. Slurs can mean: (1.) connect the notes as a phrase; (2.) for string instruments: play with one motion of the bow (up or down); (3.) for voice: sing with one syllable, or (4.) for wind instruments: don’t tongue between the notes.
Fermatas indicate that the music stops and holds the note until the conductor or soloist moves on. Musical context, style, and taste determine how long a fermata actually lasts. Breath marks indicate a quick break, or for a wind instrument like trumpet or voice, a breath. The caesura (sometimes “grand pause” or G.P.) indicates a full stop and pause before the music continues.

**Crescendo signs** and **diminuendo signs** indicate a gradual increase or decrease in loudness, respectively. The words crescendo (cresc.), diminuendo (dim.), or decrescendo (decresc.) are sometimes written instead.

**Tempo** is the speed of the beat, usually given in beats per minute (BPM). Sometimes BPM is labeled M.M. for Maelzel’s metronome. (Johann Maelzel promoted and improved the metronome in the 1800s.) The crescendo/diminuendo examples above show a tempo label of 60 quarter notes per minute, or one quarter note each second.

Musicians use many Italian terms for tempo. Some of the more common, in order from slowest to fastest, are: Grave (solemn), Largo (very slow and broad), Lento (very slow), Adagio (slow), Andante (walking pace, moderately slow), Moderato (moderate), Allegro (fast), Vivace (lively), and Presto (very fast).
Section 1.10

SUMMARY OF NOTATION GUIDELINES

Disclaimer This is only an introduction to standard notation practice. For exhaustive guidelines, see the affordable and excellent book *The Essential Dictionary of Music Notation* by Tom Gerou and Linda Lusk (Alfred Publishing, 1996).

Staves Guidelines for clefs and staves:
1. Lines and spaces are numbered from bottom to top. Lines: 1 to 5; Spaces: 1 to 4.

System
2. The plural of staff is staves. One line of music in a score is a system, which may have many staves for the individual musicians.

Clefs
3. The treble clef always circles around the "G" line (2nd line).
4. The two dots in the bass clef always surround the "F" line (4th line).
5. The center of any C clef always indicates middle C (C4).

Noteheads Guidelines for noteheads and accidentals:
6. Noteheads should be as tall as 1 space.
7. Noteheads should be oval and slightly slanted (see figure).
8. Whole notes are oval but do not slant.

Accidentals
9. Normally, accidentals immediately precede the notehead to which they apply.
10. If a chord requires 2 accidentals on notes closer than a sixth, write the upper accidental directly to the left of its notehead, and the lower accidental by its notehead staggered to the left (see 10 below).
11. For > 2 accidentals, stagger them as shown in figure 11 below.
**Chapters**

**Chapter 1: Music Notation**

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**Guidelines for stems on notes:**

12. 3rd line and above - stems down; below 3rd line – stems up. If two parts are in one staff, use stems up for the higher part, down for the lower.

13. Stems down go on the left of the notehead, stems up on the right of the notehead.

14. Stem length is normally one octave.

15. Stems for notes using ledger lines extend to the 3rd line, regardless of how high or low they are.

16. When notating seconds, the higher pitch goes on the right. If the stem goes up, it connects to the lower pitch. If the stem goes down, it connects to the higher pitch. However, if there are two voices on one staff stating a 2nd, the higher pitch’s notehead goes on the left (see the last example for item 16 below).

**Guidelines for beams on notes:**

17. For beamed notes, stems should go up or down based on the note farthest from the middle line.

18. Beam notes in the same beat together (see also item 22, next page).

19. Beams should be about twice the thickness of stems and may slant slightly if the notes ascend or descend.
Guidelines for **rhythmic notation** and **meter**:

20. Observe the usual position of rests within the staff (may be adjusted when there are two parts in one staff).

21. Dots for dotted rhythmic values are never placed on a staff line. If the notehead itself is on a staff line, the dot is put to the right of the note but in the space above it.

22. Always attempt to use rhythmic notation to clarify the placement of beats in the meter. Use ties if needed.

**Key signatures**

Guideline for **key signatures**:

23. Key signatures must be written correctly for the given clef.
2.1 Major Scales: major scale, key of C major, C major scale, tetrachord, G major scale, key signature, D major scale, A major, E major, F major, circle of fifths

2.2 The Circle of Fifths: circle of fifths, enharmonic keys, flats and sharps, circle of fifths diagram

2.3 Learning Major Key Signatures: flats/sharps on the staff, pairs add to seven (shortcut)

2.4 Minor Scales: Two Roads: minor scale, relative keys, relative minor method, relative minor with adjustment, parallel key method, melodic minor, harmonic minor

2.5 Key Signatures Self-Study Tips: order of flats in key signatures, order of sharps in key signatures, finding the key given a key signature, Frank/Metz key signature tool, the ultimate shortcut

2.6 Scale Degree Names: scale degrees, caret, tonic, dominant, subdominant, mediant, submediant, supertonic, leading tone, subtonic

2.7 Major and Natural Minor Scales for Piano: major scales, natural minor scales
### Section 2.1

#### MAJOR SCALES

**C major scale**
The white piano keys from C to C form a C major scale. These eighth notes (C, D, E, F, G, A, B, and then C again) divide into two four-note scale segments called tetrachords:

<table>
<thead>
<tr>
<th>White Piano Keys</th>
<th>Major Scale</th>
<th>Tetrachord Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>C D E F</td>
<td>W W W W half</td>
</tr>
<tr>
<td>D</td>
<td>F G A B C</td>
<td>W W W W half</td>
</tr>
</tbody>
</table>

**Tetrachord**

The lower tetrachord and the upper tetrachord each follow the major tetrachord pattern: W-W-h, with a whole step between them. To visualize the whole step/half step pattern shown above, review 1.2 The Chromatic Scale and the Piano. Remember that E to F and B to C are natural half steps (no accidentals needed).

**Key of C major**
A piece of music that uses the C major scale for its melodies and harmonies is in the key of C major. The major scale can also start on notes other than C, as long as it follows the correct pattern of whole steps and half steps: W-W-h, then W, then W-W-h again. A G major scale requires F sharp to create the E-F sharp whole step, since E to F is a natural half step.

**G major scale**

<table>
<thead>
<tr>
<th>White Piano Keys</th>
<th>Major Scale</th>
<th>Tetrachord Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>G</td>
<td>A B C D E F#</td>
<td>W W W W half</td>
</tr>
<tr>
<td>A</td>
<td>C D E F# G</td>
<td>W W W W half</td>
</tr>
</tbody>
</table>

**Key signature**
A key signature indicates the accidentals for the key at the start of each line of music instead of next to each note.

<table>
<thead>
<tr>
<th>Key Signature</th>
<th>Major Scale</th>
<th>Tetrachord Pattern</th>
</tr>
</thead>
<tbody>
<tr>
<td>G major</td>
<td>G A B C D E F#</td>
<td>W W W W half</td>
</tr>
</tbody>
</table>

The sharp is in the key signature, so we don't need it here.
D major scale

G is the fifth scale note in C major, and the G major scale has one more sharp than C major. Changing the key to the fifth scale note of a particular scale always adds a sharp (or takes away a flat). Since D is the fifth scale note of G (G, A, B, C, D), the D major scale uses two sharps. The added sharp is always one scale note below the new key.

A major

Continuing “up 5, add a sharp,” A major has three sharps, E major has four, and so on. Again, the new sharp in the key signature is always one scale note below the new key.

E major

Similarly, counting down five scale notes takes away a sharp (or adds a flat). For instance, C, B, A, G, F = 1, 2, 3, 4, 5. Since F is the fifth scale note down starting from C, F major has one more flat than C major. All flat keys follow the same pattern: counting down five scale notes adds a flat.
Section 2.2
THE CIRCLE OF FIFTHS

Circle of fifths
The circle of fifths is a common way to arrange the keys so each key moving clockwise starts on the fifth note of the preceding key. Major keys are listed outside the circle, with minor keys inside. (For minor keys, see 2.4 Minor Scales: Two Roads.)

Enharmonic keys
Enharmonic keys are written differently, but played the same on the piano keyboard, like B and C flat. Enharmonic keys share a box in the circle of fifths diagram.

Flats and sharps
Moving clockwise moves up five scale notes and adds a sharp (or takes away a flat), while moving counterclockwise moves down five notes and adds a flat (or takes away a sharp). Always count the starting note as one.

Circle of fifths diagram

Enharmonic keys share a box.
Section 2.3

Learning Major Key Signatures

Flats / sharps on the staff

The order of flats on the staff is B-E-A-D-G-C-F, or BEAD-Greatest Common Factor. The order of sharps on the staff is F-C-G-D-A-E-B, or Fat Cats Go Down Alleys Eating Birds.

Pairs add to seven (shortcut)

For each letter name, there is a flat key and a sharp key. Only one will have an accidental in the key name (except C flat/C/C sharp). The total number of accidentals for the two keys always adds up to seven. For instance, G flat major has 6 flats, and G major has 1 sharp. See 2.5 Key Signatures Self-Study Tips for more tips.

<table>
<thead>
<tr>
<th>FLAT KEYS</th>
<th>SHARP KEYS</th>
</tr>
</thead>
<tbody>
<tr>
<td>C/C#</td>
<td>C</td>
</tr>
<tr>
<td>0 flats</td>
<td>7 sharps</td>
</tr>
<tr>
<td>F/F#</td>
<td>F</td>
</tr>
<tr>
<td>1 flat</td>
<td>6 sharps</td>
</tr>
<tr>
<td>Bb/B</td>
<td>B</td>
</tr>
<tr>
<td>2 flats</td>
<td>5 sharps</td>
</tr>
<tr>
<td>Eb/E</td>
<td>E</td>
</tr>
<tr>
<td>3 flats</td>
<td>4 sharps</td>
</tr>
<tr>
<td>Ab/A</td>
<td>A</td>
</tr>
<tr>
<td>4 flats</td>
<td>3 sharps</td>
</tr>
<tr>
<td>Db/D</td>
<td>D</td>
</tr>
<tr>
<td>5 flats</td>
<td>2 sharps</td>
</tr>
<tr>
<td>Gb/G</td>
<td>G</td>
</tr>
<tr>
<td>6 flats</td>
<td>1 sharp</td>
</tr>
<tr>
<td>Cb/C</td>
<td>C</td>
</tr>
<tr>
<td>7 flats</td>
<td>0 sharps</td>
</tr>
</tbody>
</table>
Section 2.4

MINOR SCALES: TWO ROADS

Minor scale

The most common minor scale, the **natural minor scale**, follows the pattern of half steps and whole steps formed by the white piano keys from A up to the next A: whole, half, whole; then whole; then half, whole, whole.

![Minor scale diagram]

Relative keys

**Relative keys** are any major scale and natural minor scale that share a key signature. The third note of the minor scale is the first note of the relative major with the same key signature. For example, C is the third scale note of A minor. C major and A minor are relative keys sharing a key signature with no flats or sharps. Remember: Relatives at a family reunion look alike, and relative key signatures “look alike” also.

![Relative key diagram]

Road one: relative minor

There are two roads to find key signatures for minor scales: relative and parallel. The example below illustrates the relative minor method for spelling E minor.

**STEP 1:** Count up three letter names to find the relative major.

**STEP 2:** Spell the relative major key signature.

**STEP 3:** Adjust if necessary to match the minor scale you want.

1. Count up three letters.
2. G major has one sharp. E minor also has one sharp.
3. G major includes E♯, so E minor also includes E♯.

![Relative minor example]
Chapter 2: Major and Minor Scales and Keys

Relative minor with adjustment

Sometimes counting up three letters gives a major key that doesn’t fit with the minor key you want. C minor is a good example. Counting up from C gives E: C, D, E. E major has four sharps, including C sharp. Since we want C natural, not C sharp, we need to use the key signature for E flat major (three flats) instead of E major.

![Diagram](image)

1. Count up three letters.
2. E major has four sharps.
3. E major includes C♯, not C♯, so use the E♭ major key sig. instead.

Road two: parallel minor

Parallel keys share the same starting note (called the tonic). To find the natural minor notes using the parallel key, write a major scale on the same note, then lower 3, 6, and 7 using accidentals. Although the parallel and relative methods both work, minor keys should be memorized.

![Diagram](image)

Lower steps 3, 6, and 7 with accidentals.

Melodic minor

Melodic minor is natural minor with steps 6 and 7 raised going up, but like natural minor going down. Notice the F sharp in the key for E minor.

![Diagram](image)

Harmonic minor

Harmonic minor is natural minor with step 7 raised (only) both up and down. Again, the F sharp reflects the key signature for E natural minor.

![Diagram](image)
Section 2.7

Major and Natural Minor Scales for Piano

Major scales

Right hand fingerings above, left hand fingerings below; thumbs are 1; enharmonic keys are listed only once.
Natural minor scales

Right hand fingerings above, left hand fingerings below; thumbs are 1; enharmonics keys are listed only once.
Chapter 3

INTERTVALS AND TRANSPOSITION

3.1 Introduction to Intervals: interval definition, major and perfect intervals, minor intervals, diminished, augmented, consonant intervals, perfect and imperfect consonances, dissonant intervals, perfect fourth, simple and compound intervals

3.2 Mastering Intervals 1: major and minor seconds, pattern for seconds, pattern for thirds, pattern for fourths, pattern for fifths, pattern for sixths, pattern for sevenths, summary of core intervals

3.3 Mastering Intervals 2: harmonic versus melodic intervals, spelling descending intervals, interval inversion, using inversion for sixths and sevenths, identifying intervals, summary of interval types

3.4 Transposition: transposition of notes, transposition of chords, transposition of key signatures, transposing a melody, transposing instruments, common transpositions
Chapter 4

Triads and Seventh Chords

4.1 Introducing Triads: triad, root, third, fifth, major triads, minor triads, diminished triads, augmented triads, spelling minor triads, spelling diminished triads, spelling augmented triads, root position, first inversion, second inversion, voicing and inversion

4.2 The Major Triads: Spell Them Quickly: overview, stack of thirds, BEAD raise third, B bumps both

4.3 Spelling Triads in Four Steps: spelling triads given the third or the fifth, examples given the third, examples given the fifth

4.4 Seventh Chords: seventh chords, major seventh chord, minor seventh chord, major-minor (dominant) seventh chord, half-diminished seventh chord, fully-diminished seventh chord, inversions

4.5 Common Chord Reference Chart: reference chart listing triads and seventh chords

4.6 Basic Lead Sheet Symbols: lead sheet symbols for triads, lead sheet symbols for seventh chords, vertical and horizontal slashes
Section 4.1

Introducing Triads

Triad

A triad is a three-note chord built of two third intervals stacked on top of each other. The three notes are called root, third and fifth from bottom to top. In the chord below, the two third intervals are C to E and E to G.

\[ \text{Root, Third, Fifth} \]

\[ \text{fifth} \]

\[ \text{third} \]

Major triads

A major triad has a major third on the bottom and a minor third on top. The chord that occurs on the first step of a major key is a major triad.

\[ \text{Minor triads} \]

\[ \text{minor 3rd on top} \]

\[ \text{major 3rd on bottom} \]

Minor triads

A minor triad has a minor third on the bottom and a major third on top. The chord that occurs on the first step of a minor key is a minor triad.

\[ \text{Diminished triads} \]

\[ \text{minor 3rd on top} \]

\[ \text{minor 3rd on bottom} \]

Diminished triads

A diminished triad is a stack of two minor thirds.

\[ \text{Augmented triads} \]

\[ \text{minor 3rd on top} \]

\[ \text{minor 3rd on bottom} \]

Augmented triads

An augmented triad is a stack of two major thirds.
Chapter 4: Triads and Seventh Chords

**Spelling minor triads**

To spell a minor triad, start with a major triad, then lower the 3rd using an accidental to make a minor triad.

```
F major → lower 3rd → F minor
```

**Spelling diminished triads**

To spell a diminished triad, start with a major triad, then lower the 3rd and 5th to make a diminished triad. Another option is to start with a major triad, then raise the root to make a diminished triad.

```
F major → lower 3rd, 5th → F dim.
F major → raise root → F# dim.
```

**Spelling augmented triads**

To spell an augmented triad, spell a major triad, then raise the 5th (only) to make an augmented triad.

```
F major → raise 5th → F aug.
```

**Root position**

- **First inversion**
- **Second inversion**

Root position means the root is the lowest note. When the third is the lowest note, the triad is in first inversion. When the fifth is the lowest note, the triad is in second inversion.

```
root position
1st inversion
2nd inversion

root
third on bottom
fifth on bottom
```

**Voicing and inversion**

Chord voicing refers to the ordering of the notes (root, third, fifth) above the lowest note. Changing the chord voicing does not change the inversion.

```
2nd inversion (OR) → fifth on the bottom
2nd inversion (OR) → fifth on the bottom
2nd inversion etc.
```
Section 4.4

SEVENTH CHORDS

Seventh chords

A seventh chord is a four-note chord built using stacked thirds. The four notes are the root, third, fifth and seventh from bottom to top. There are five basic types. A major seventh chord has a major triad and a major seventh. A minor seventh chord has a minor triad and a minor seventh.

Major seventh, Minor seventh

Major-minor seventh (dominant) seventh

A major-minor seventh chord has a major triad and a minor seventh. Mm7 chords function as dominant chords. “Mm7...dominant?”

Half-diminished, Fully-diminished

A half-diminished seventh has a diminished triad and a minor seventh. A fully-diminished seventh chord is a diminished triad plus a diminished seventh. Fully-diminished seventh chords are a stack of all minor thirds.

Inversions

Inversions may be root position (root on bottom), 1st inversion (3rd on bottom), 2nd inversion (5th on bottom), or 3rd inversion (7th on bottom). See 5.2 Roman numerals and Volumes 2 and 3 for more study.


Section 4.6  

**Basic Lead Sheet Symbols**

**Lead sheet symbols for triads**

Lead sheet symbols are written above a melody and indicate the chords to play underneath. They show the root of the chord and the chord quality. For triads, the common chord qualities are major, minor, diminished, and augmented.

- **C** (Major)
- **C- or Cmin** (Minor)
- **Cdim or Cmin\(^b5\) or C\(^o\)** (Diminished)
- **Caug or Cmaj\(^#5\)** (Augmented)

**Lead sheet symbols for seventh chords**

The symbols for seventh chords work similarly:

- **C\(^7\)** (Mm7, "Dominant" 7th)
- **C\(^\#\) or Cmaj\(^7\)** (Major 7th)
- **C-\(^7\) or Cmin\(^7\)** (Minor 7th)
- **Cmin\(^b5\) or C\(^o\)\(^7\)** (Half—dim 7th)
- **C\(^o\)\(^7\) or Cdim\(^7\)** (Diminished 7th (B\(^\#\) often spelled A\(^\#\))

**Vertical and horizontal slashes**

A **vertical slash** indicates the note that should be played lowest. A **horizontal slash** indicates one chord on top of another chord (often, two different triads).

- **G\(^7\)/B**
- **E\(^\#\) or Ed\(^\#\)**

**See also**

See *Volume 3: Jazz and Popular Music Theory* and *Jazzology* by Rawlins and Bahha. For roman numerals, see **5.2 Roman Numerals**.
Chapter 5

INTRODUCTION TO HARMONIC ANALYSIS

5.1 Texture in Music: harmonic analysis, texture, texture types, monophonic texture, unison, polyphonic texture, homophonic texture, homophonic: homorhythmic accompaniment, homophonic: blocked chord accompaniment, homophonic: Alberti bass accompaniment, homophonic: broken chord accompaniment, heterophonic texture

5.2 Roman Numerals: roman numerals, roman numerals and chord quality, triad roman numerals in major keys, seventh chord roman numerals in major keys, triad roman numerals in minor keys, seventh chord roman numerals in minor keys, variations in minor keys, inversion numbers

5.3 Harmonic Progression: harmonic progression, V—I (V—i), circle of fifths, sequence, downward thirds, subdominant progressions, the plagal progression, the deceptive progression, the subtonic in minor keys, harmonic progression diagram (major keys), harmonic progression diagram (minor keys)

5.4 Harmonic Analysis 1: Homophonic Texture: harmonic analysis, harmonic rhythm, pitch inventory, harmonic analysis: homorhythmic textures, resolving ambiguities: consider progressions and assume the fifth is missing, harmonic analysis: blocked chord and arpeggiated accompaniments, nonchord tones, finding the root

5.5 Nonchord Tones 1: nonchord tones, consonance, dissonance, passing tones, neighbor tones, neighbor group, cambiata, appoggiaturas, escape tones, retardations, anticipations, pedal tones, pedal point

5.6 Nonchord Tones 2: Suspensions: suspensions, preparation, suspension, resolution, suspension types, chain of suspensions

5.7 Second Inversion Chords: four types of second inversion triads, C-PAP, cadential, passing, arpeggio, pedal, summary: tips for identification

5.8 Harmonic Analysis 2: Polyphonic Texture: Analysis of Menuet from French Suite No. 2, J.S. Bach
Appendices

Solfège and Rhythmic Syllables

Appendix 1: Solfège Syllables: standard syllables, chromatic syllables, fixed do versus moveable do, moveable do: do-based and la-based minor, singing with numbers, sample melody

Appendix 2: Rhythmic Counting Syllables: rhythmic counting systems, simple time: notes on the beat, simple time: upbeats, simple time: the second fourth of the beat, simple time: other notes, compound time: two systems, compound time: notes on the beat, compound time: the second third of the beat, compound time: the last third of the beat, compound time: other notes, other notes
Postlude

Review, Resources, Index

Postlude 1: Remember-Forever Review: Music Theory Fundamentals: components, staffs, clefs, accidentals, middle C, rhythmic values, time signatures, meter, tuplets/grouplets, repeats, dynamics, articulation, tempo, major scale, major keys and key signatures, minor scales and minor keys, scale degrees (steps), intervals, triads, seventh chords, solfège, rhythmic counting, texture types

Postlude 2: Music Fundamentals: More Resources: about the resources, websites, books

Postlude 3: Index of Music Theory Terms