



# Music Theory Fundamentals

High-Yield Music Theory, vol. 1

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*LearnMusicTheory.net*

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*Foreword:***WHAT IS HIGH-YIELD MUSIC THEORY?**

<b>Philosophy</b>	The core principles guiding high-yield music theory are: <ol style="list-style-type: none"> <li>1. Assume no prior knowledge.</li> <li>2. Build one concept at a time.</li> <li>3. Get to the POINT!</li> </ol>
<b>Volumes</b>	The latest editions of this study reference are available at <i>LearniMusicTheory.net</i> . Eventually there will be <b>multiple volumes</b> , covering <b>Music Theory Fundamentals; Harmony; Jazz, Pop, and Contemporary Music Theory (including Twentieth-Century Music); and Form in Music.</b>
<b>Format</b>	The format for each volume is consistent: <ol style="list-style-type: none"> <li>1. The left column lists <b>terms</b> to help you organize your study and find topics quickly.</li> <li>2. <b>Bold</b> indicates key concepts.</li> <li>3. Each volume ends with a Remember-Forever Review and More Resources.</li> </ol>
<b>Students: how to use this guide</b>	<b>Students</b> can... <ul style="list-style-type: none"> <li>...read it before or after your primary text for a music theory course.</li> <li>...use it as an <b>efficient review</b> before entrance exams, barriers, etc.</li> <li>...use it as a <b>theory reference book</b> by looking up terms in the index.</li> <li>...use it to quiz or tutor your fellow students.</li> <li>...check out the great resources listed under "More Resources."</li> </ul>
<b>Teachers: how to use this guide</b>	<b>Teachers</b> can... <ul style="list-style-type: none"> <li>...use it as a <b>class lecture outline</b> along with your favorite theory text.</li> <li>...use it as a <b>review guide</b> after presenting the material with your favorite text.</li> <li>...use the <b>Remember-Forever Review</b> section before final exams.</li> <li>...require students to purchase one or more volumes for extra study.</li> <li>...use it as a <b>primary textbook</b> alongside your favorite workbook or music anthology.</li> </ul>

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## *Chapter 1*

# MUSIC NOTATION

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**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.

### Note names

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...

### Clef Treble 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.

Diagram illustrating the treble clef staff. The staff is labeled "staff" and "treble clef". The notes are G, A, B, C, D, E, F, G. The lines are labeled "line 5" and "line 1".

Every **G**ood **B**oy **D**oes **F**ine      **F**-**A**-**C**-**E** spells **f**ace

lines: E G B D F      spaces: D F A C E G

### 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.

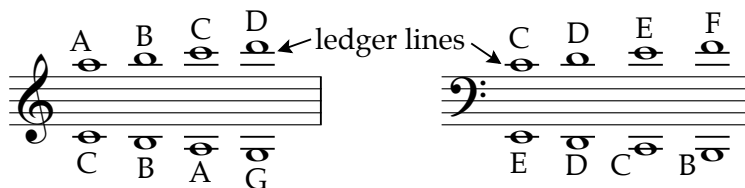
Diagram illustrating the bass clef staff. The staff is labeled "staff" and "bass clef". The notes are F, G, A, B, C, D, E, F, G, A, B.

Good **B**oys **D**o **F**ine **A**lways      **A**ll **C**ars **E**at **G**as  
**A**ll **C**ows **E**at **G**rass

lines: G B D F A      spaces: F A C E G B

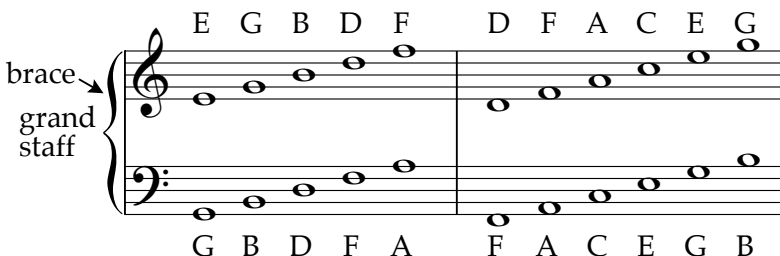
**Ledger lines**

**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.



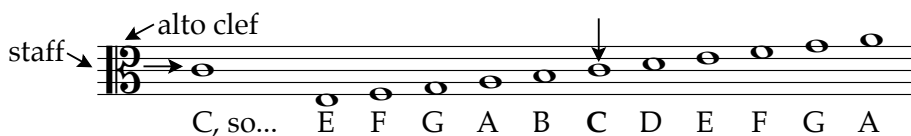
**Grand staff**

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.



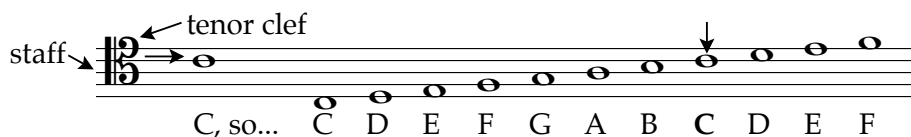
**C clefs**  
**Alto clef**

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.

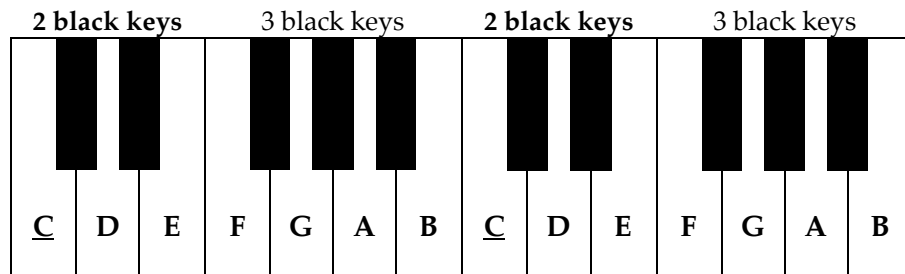


## Section 1.2

### 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.



#### 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.

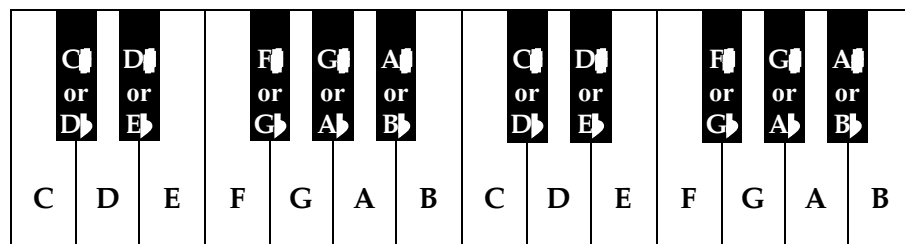
#### Natural half steps

#### Accidentals

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

#### Flat, natural, sharp

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

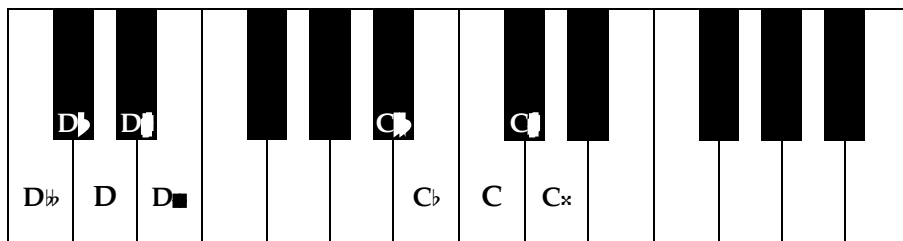


#### Enharmonic notes

**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.

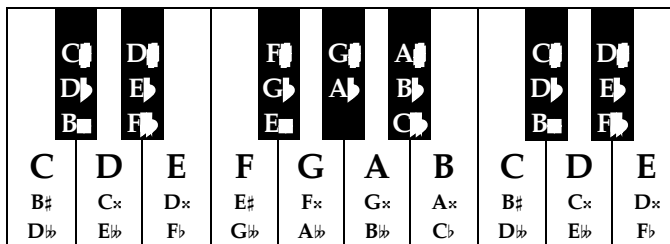
**Double flat**  
**Double sharps**

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.

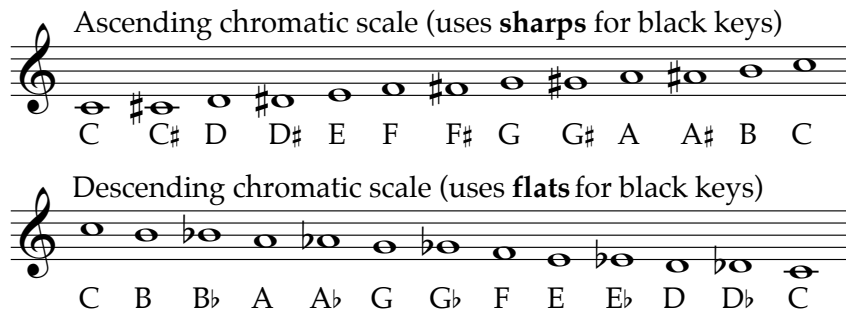


**Whole step**

A **whole step** is two half steps. For instance, for C up to D, the two half steps are C to C $\sharp$  and C $\sharp$  to D.

**Scale**  
**Chromatic 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. 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.



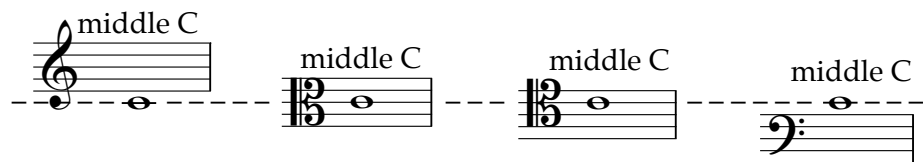


### Section 1.3

## ALL ABOUT OCTAVES

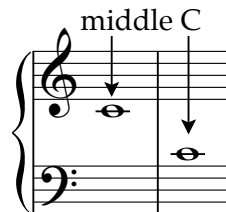
**Octave** An **octave** is the distance from a note up or down to the next note with the **same name**. For example, from the pitch A up to the next A is one octave. Octaves span **eight letter names**: A-B-C-D-E-F-G-A = 1-2-3-4-5-6-7-8.

**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).



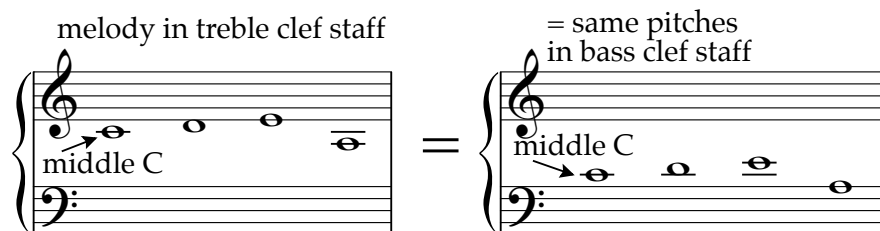
**Middle C on the grand staff**

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.



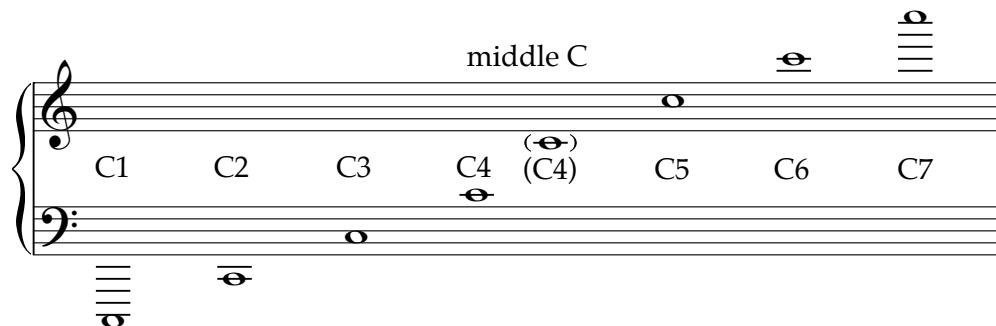
**Ledger lines between the staves**

**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.



**American Standard octave designations**

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 Cb5=B4.

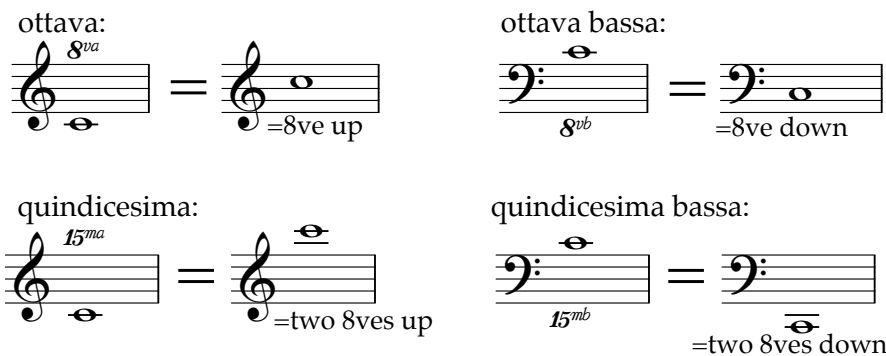


**Helmholtz octave designations**

**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").

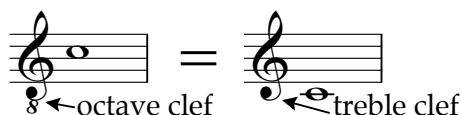
**Ottava  
Quindicesima**

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.



**Octave clef**

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



## Section 1.4

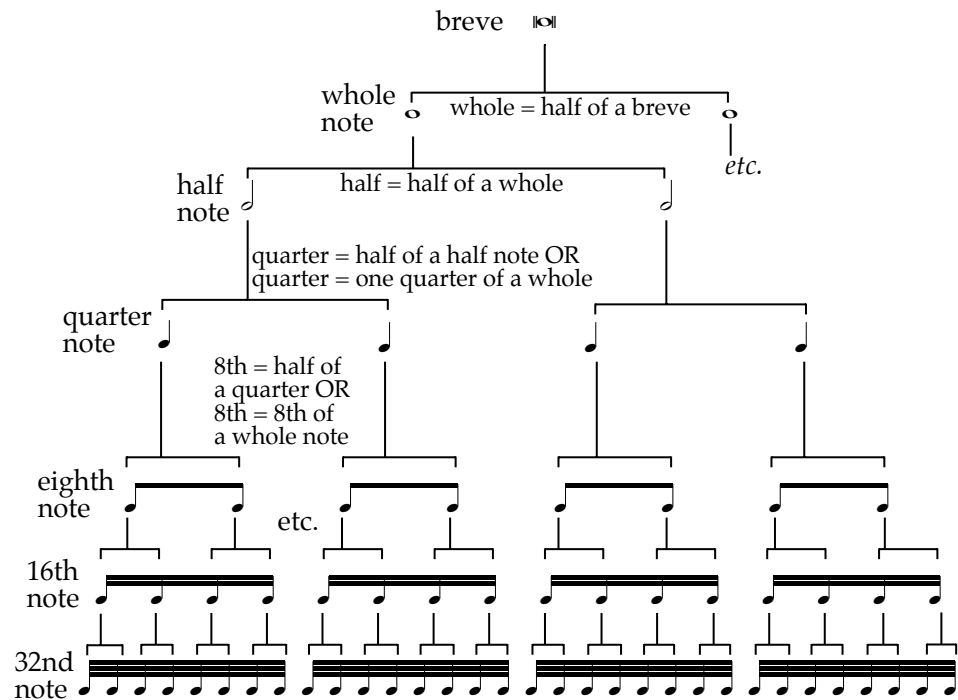
### RHYTHMIC VALUES

**Duration**  
**Rhythmic value**  
**Rhythm**

**Duration** is how long a note lasts. A **rhythmic value** is a symbol indicating relative duration (see table below). A **rhythm** is a series of rhythmic values.


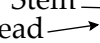

**Rhythmic values**

**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.



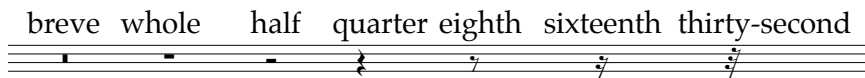
**Notehead**  
**Stems**  
**Flags**  
**Beams**

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.

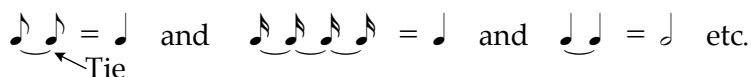
Stem →  Flag  
 Notehead →  =  Beam  
 (2 eighth notes with flags) = (2 eighth notes beamed together)

**Rests**

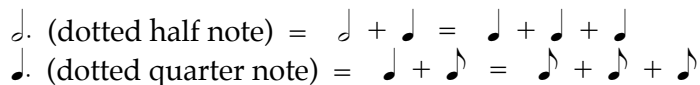
**Rests** are similar to notes, but indicate **lengths of silences**. A breve rest is twice as long as a whole rest, a whole rest is twice as long as a half rest, and so on. Remember that a whole note looks like a “hole” in the ground.

**Ties**

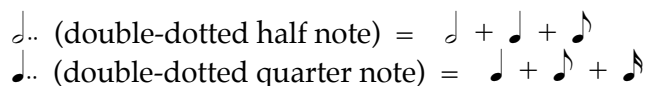
A **tie** combines rhythmic values together. For example, two eighth notes tied together make a rhythmic value equal to one quarter note. Ties connect notes of the **same pitch**. Ties never connect rests.

**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.

**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.

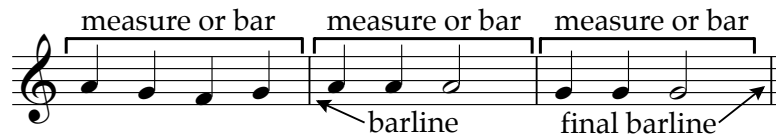


### Section 1.5

## TIME SIGNATURES IN SIMPLE METER

Beat  
Measure  
Bar, Barline  
Final barline

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.



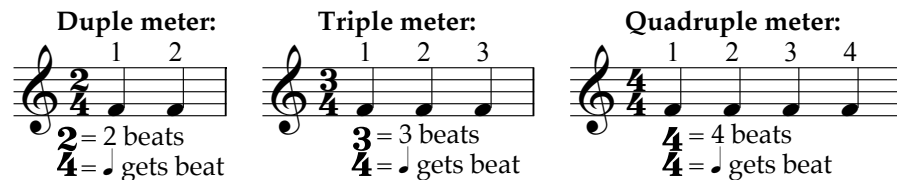
Time signature  
Beat unit, Simple  
time signature

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**

**Cut time**  
**Alla breve**

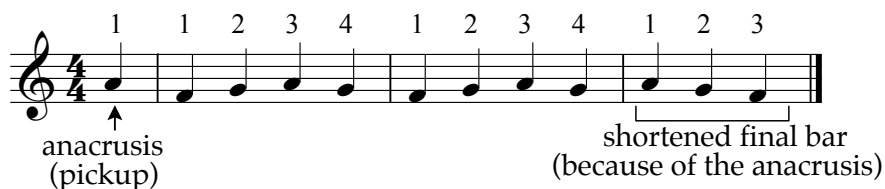
**Common time**

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**.



**Anacrusis**  
**Pickup measure**

An **anacrusis** (or **pickup measure**) 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**  
**Strong beat**  
**Weak beat**

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:

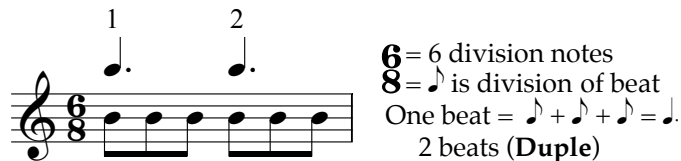
1. **Duple meters:** Meters with **two** beats follow a **STRONG-weak** stress pattern for the two beats.
2. **Triple meters:** Meters with **three** beats follow a **STRONG-weak-weak** stress pattern for the three beats.
3. **Quadruple meters:** Meters with **four** beats follow a **STRONGEST-weak-STRONG-weak**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

### Section 1.6

## COMPOUND AND ASYMMETRIC METER

### Compound time signatures

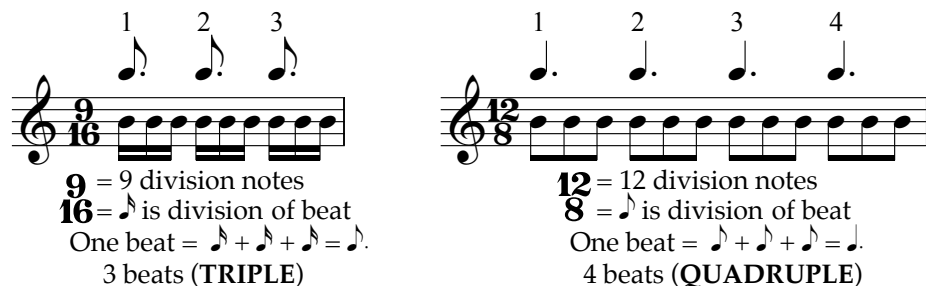
Beats in **compound time signatures** divide into **three** division notes, not two. The **top number** indicates the number of **division notes** per measure. The **bottom number** indicates the **division** rhythmic value (not the beat unit). It takes **three** division notes (not two) to make one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



6 = 6 division notes  
8 =  $\frac{1}{8}$  is division of beat  
One beat =  $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{1}{4}$ .  
2 beats (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).

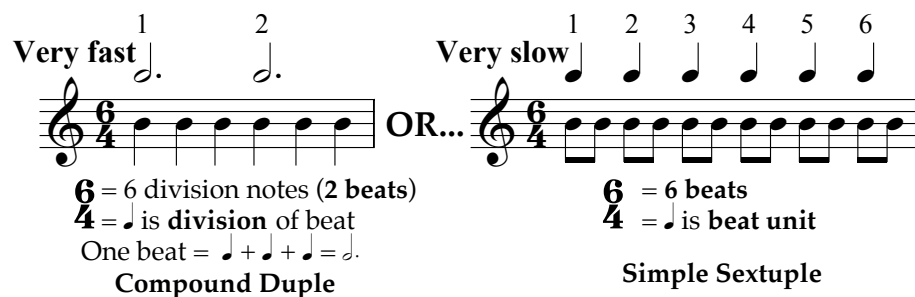


9 = 9 division notes  
16 =  $\frac{1}{16}$  is division of beat  
One beat =  $\frac{1}{8} + \frac{1}{8} + \frac{1}{8} = \frac{1}{4}$ .  
3 beats (TRIPLE)

12 = 12 division notes  
8 =  $\frac{1}{8}$  is division of beat  
One beat =  $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{1}{4}$ .  
4 beats (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.



Very fast 6 = 6 division notes (2 beats)  
4 =  $\frac{1}{4}$  is division of beat  
One beat =  $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = \frac{1}{4}$ .  
Compound Duple

OR... Very slow 6 = 6 beats  
4 =  $\frac{1}{4}$  is beat unit  
Simple Sextuple

### Asymmetric time signatures

**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.

### Performing asymmetric time signatures

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.

### Anacrusis and stress patterns in compound meter

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**.

### Summary of time signatures and 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*

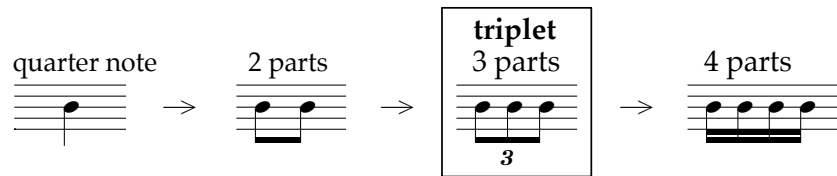
**TUPLETS/GROUPLETS**

**Tuplets  
Grouplets**

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.”

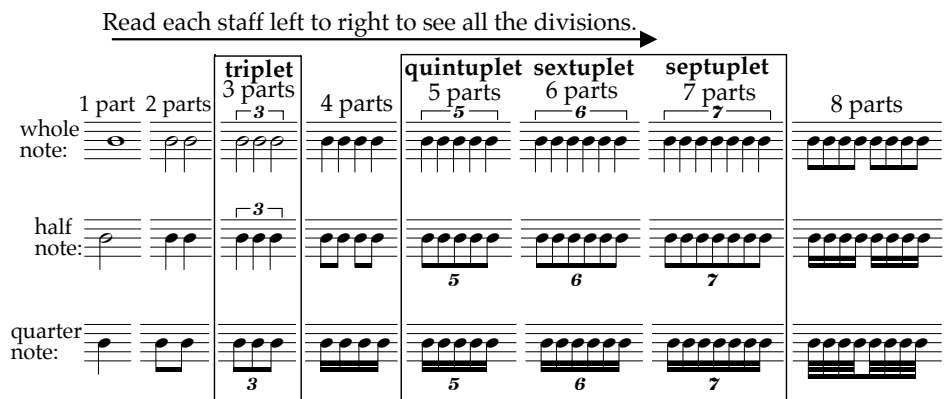
**Tuplets**

**Tuplets** 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.



**Quintuplets  
Sextuplets  
Septuplets**

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:

Quadruplets:

**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.

Groups of 3 tied sixteenths = dotted eighths = duplet eighths

**Nonstandard tuplets**

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

5:4 = 5 in the space normally taken by 4

OR showing the rhythmic value ( 5:4 ):

Section 1.8

REPEAT SIGNS AND REPEATED SECTIONS

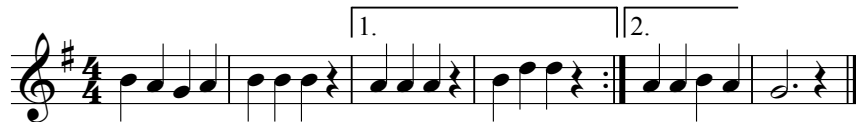
Simple repeats

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.



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.



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.



**D.S. al coda**  
**Dal segno al coda**

**D.S. al fine**  
**D.C. 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.

**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*** = **pianississimo** = very, very soft

***pp*** = **pianissimo** = very soft

***p*** = **piano** = soft

***mp*** = **mezzo-piano** = medium-soft

***mf*** = **mezzo-forte** = medium-loud

***f*** = **forte** = loud

***ff*** = **fortissimo** = very loud

***fff*** = **fortississimo** = very, very loud

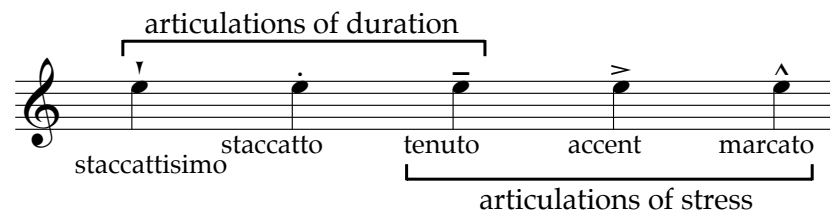
***fp*** = forte followed suddenly by piano; also ***mfp***, ***ffp***, etc.

***sfz*** = **sforzando** = a forceful, sudden accent

***fz*** is forceful but not as sudden as ***sfz***

### Articulations

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



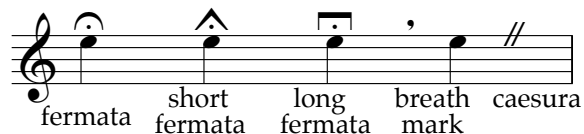
### Slurs Bowings

**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.



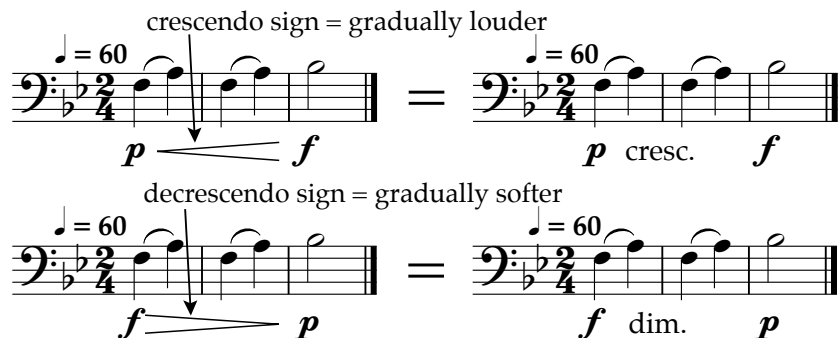
**Fermatas**  
**Breath marks**  
**Caesura**  
**Grand pause**

**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**  
**Diminuendo**  
**Decrescendo**

**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**  
**BPM / M.M.**

**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.

**Italian tempo**  
**indications**

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

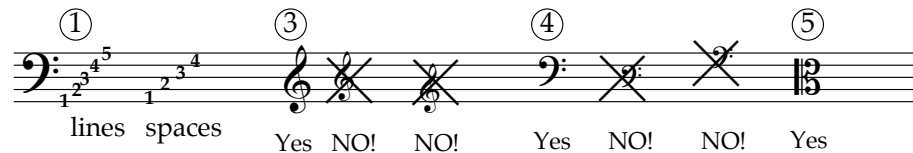
## SUMMARY OF NOTATION GUIDELINES

**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**:

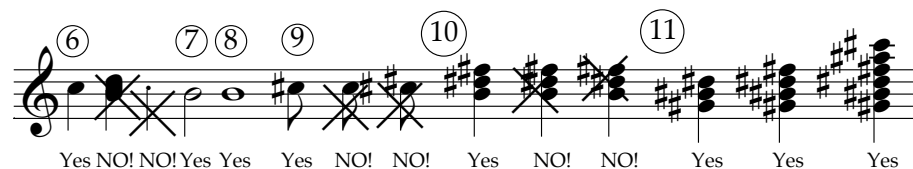
1. Lines and spaces are numbered from bottom to top. Lines: 1 to 5; Spaces: 1 to 4.
2. The plural of staff is **staves**. One line of music in a score is a **system**, which may have many staves for the individual musicians.
3. The **treble clef** always circles around the "G" line (2nd line).
4. The 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.
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.



**Stems**

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).

Examples illustrating stem placement and length guidelines:

- 12: Shows stems down for notes above the 3rd line and stems up for notes below the 3rd line.
- 13: Shows stems down on the left and stems up on the right of the notehead.
- 14: Shows a stem of normal length (one octave).
- 15: Shows a stem for a note with a ledger line extending to the 3rd line.
- 16: Shows two notes in a second with stems connecting them, illustrating the rule for higher pitch noteheads on the left.

YesYesYesYes NO!NO! YesNO!YesNO! YesYes NO!NO! YesYesNO! Yes YesNO! NO! Yes Yes Yes

**Beams**

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.

Examples illustrating beam placement and thickness guidelines:

- 17: Shows beamed notes with stems up or down based on the note farthest from the middle line. Labels: "Yes", "Yes", "NO!", "NO!".
- 18: Shows beamed notes in the same beat. Labels: "Yes - Beams follow beats" and "NO-Beats unclear; hard to read".
- 19: Shows beams of varying thickness and slant. Labels: "Yes", "NO!", "NO!".



**Rhythm and meter**

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.

Whole rest="hole" in the ground

Take note of vertical positioning

20

21

22

Yes - Beats are clear

NO-Beats unclear; where are 2, 3, 4? Hard to read.

NO-Where is beat 2? Hard to read.

**Key signatures**

Guideline for **key signatures**:

- 23. Key signatures must be written correctly for the given clef.

23

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## *Chapter 2*

# MAJOR AND MINOR SCALES AND KEYS

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**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

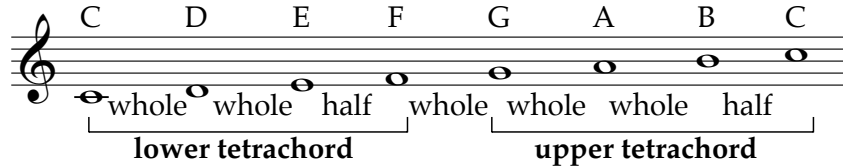
*Section 2.1*

**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**:

**Tetrachord**



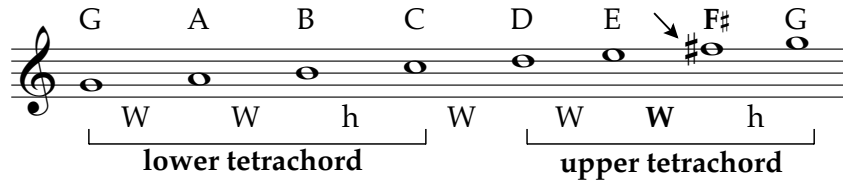
**Major tetrachord**

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**

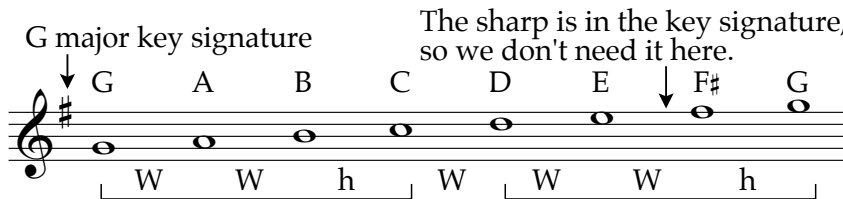
A piece of music that uses the C major scale for its melodies and harmonies is **in the key of C major**. The major scale can also start on notes other than C, as long as it follows the correct pattern of whole steps and half steps: W-W-h, then W, then W-W-h again. A **G major scale** requires F sharp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

**G major scale**



**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.



**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**.

D major key signature (2 sharps)

D E F# G A B → C# D

W W h W W W h

**A major**  
**E 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**.

A major key signature

A B C# D E F# → G# A

W W h W W W h

E major key signature

E F# G# A B C# → D# E

W W h W W W h

**F 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.

F major key signature (1 more flat than C major)

F G A → Bb C D E F

W W h W W W h

Bb major key signature (1 more flat than F major)

Bb G A → Eb F G A Bb

W W h W W W h

*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.**)

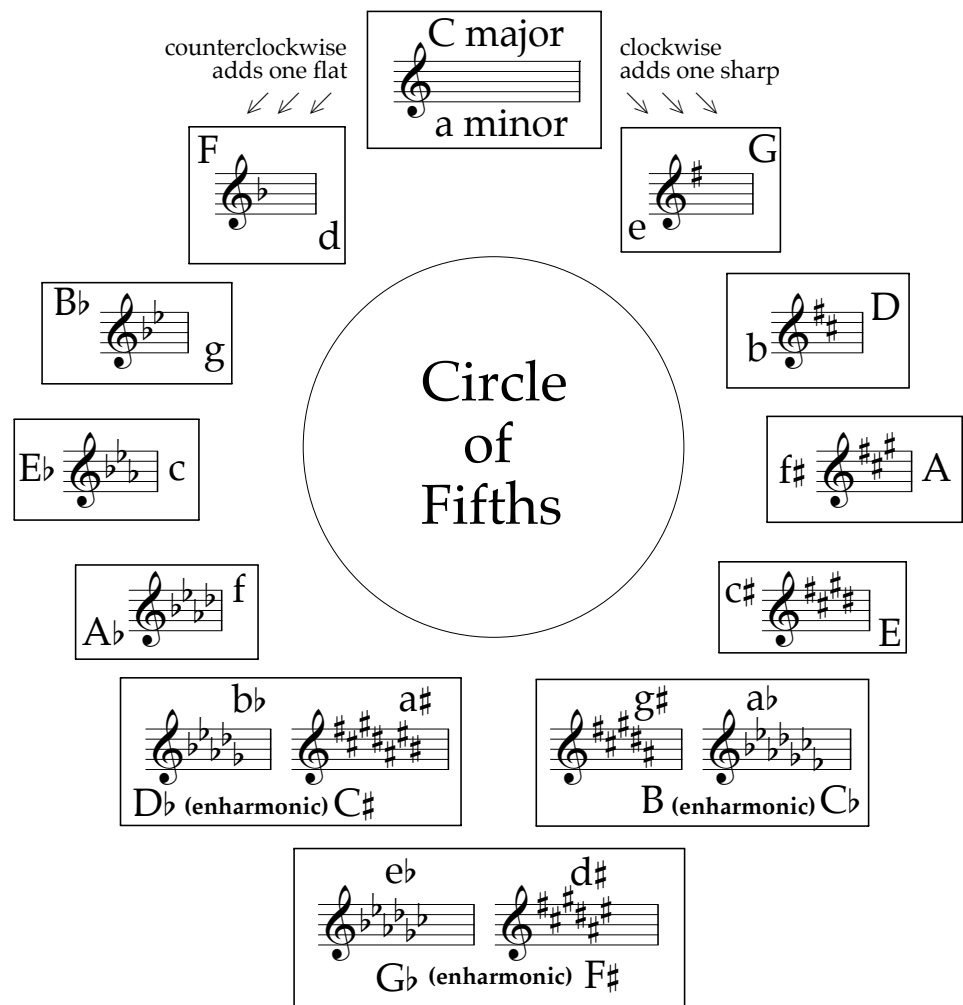
**Enharmonic keys**

**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.

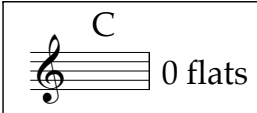
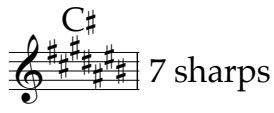
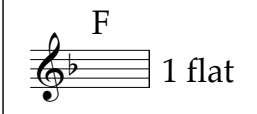
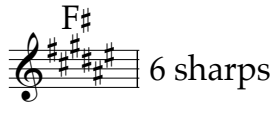
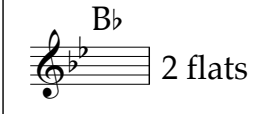
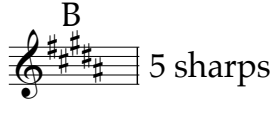
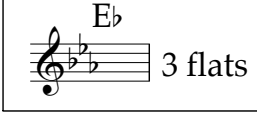
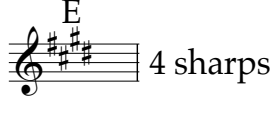

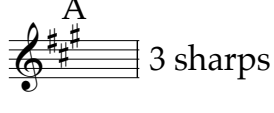

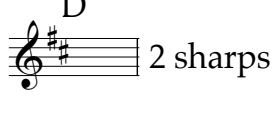
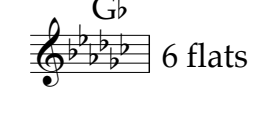
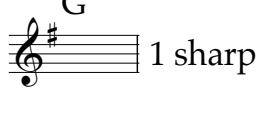
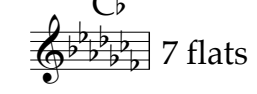
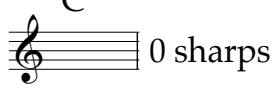
*Section 2.3***LEARNING MAJOR KEY SIGNATURES**

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.

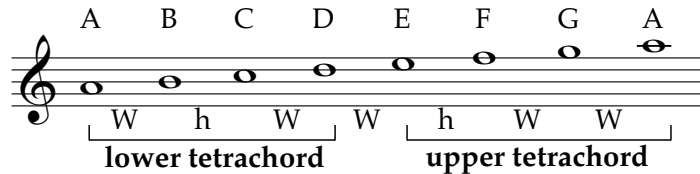
	FLAT KEYS		SHARP KEYS	
<b>C/C#</b>	 0 flats	+	 7 sharps	=7
<b>F/F#</b>	 1 flat	+	 6 sharps	=7
<b>Bb/B</b>	 2 flats	+	 5 sharps	=7
<b>Eb/E</b>	 3 flats	+	 4 sharps	=7
<b>Ab/A</b>	 4 flats	+	 3 sharps	=7
<b>Db/D</b>	 5 flats	+	 2 sharps	=7
<b>Gb/G</b>	 6 flats	+	 1 sharp	=7
<b>Cb/C</b>	 7 flats	+	 0 sharps	=7

*Section 2.4*

**MINOR SCALES: TWO ROADS**

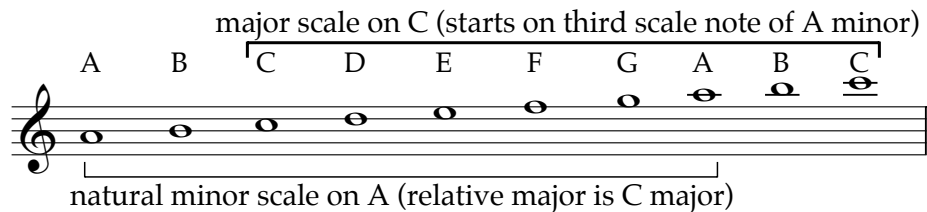
**Minor scale**

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.



**Relative keys**

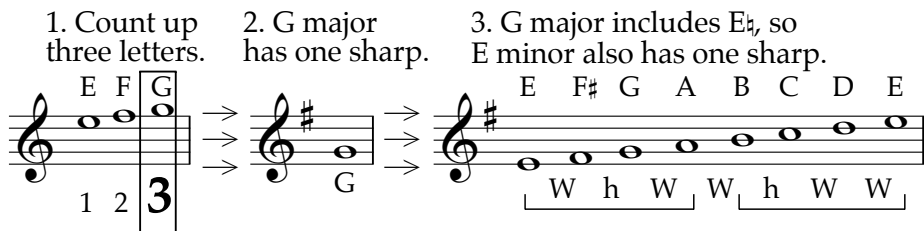
**Relative keys** are any major scale and natural minor scale that share a key signature. The **third note** of the minor scale is the first note of the **relative major** with the same key signature. For example, C is the third scale note of A minor. C major and A minor are relative keys sharing a key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



**Road one: relative minor**

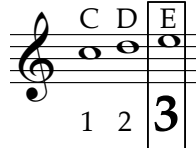
There are two roads to find key signatures for minor scales: relative and parallel. The example below illustrates the **relative minor** method for spelling E minor.


- 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.




**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.


1. Count up three letters.  



2. E major has four sharps.  


3. E major includes C#, not C $\flat$ , so use the E $\flat$  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**.

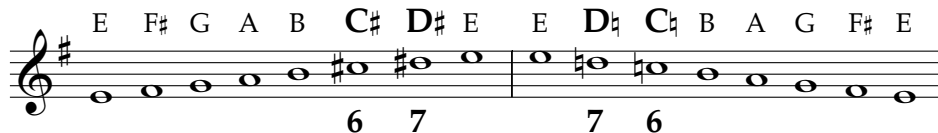
**E major = 4 #**  


**E minor = 1 #**  


*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.



**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.





*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.

The image displays 12 musical staves, each representing a major scale in a different key. Each staff is labeled with its key signature: C, F, Bb, Eb, Ab, C#, F#, B, E, A, D, and G. The scales are written in treble clef with a 4/4 time signature. Each staff contains two lines of music: the upper line for the right hand and the lower line for the left hand. Fingerings are indicated by numbers 1 through 5 above the notes for the right hand and below the notes for the left hand. The scales are presented in ascending and descending order. The keys are listed in the following order from top to bottom: C, F, Bb, Eb, Ab, C#, F#, B, E, A, D, and G.

**Natural minor scales**

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

The image displays 12 staves of musical notation, each representing a natural minor scale in a specific key. The keys are: C, F, Bb, Eb, Ab, C#, F#, B, E, A, D, and G. Each staff contains two lines of music: the upper line for the right hand and the lower line for the left hand. Above the right-hand notes are fingerings (1-5), and below the left-hand notes are fingerings (5-1). The scales are presented in three measures each, showing both ascending and descending directions. The keys are arranged in a circle: C, F, Bb, Eb, Ab, C#, F#, B, E, A, D, G.

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## *Chapter 3*

# INTERVALS AND TRANSPOSITION

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**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

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## *Chapter 4*

# TRIADS AND SEVENTH CHORDS

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**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

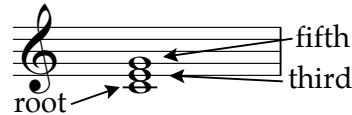
**4.4 Seventh Chords:** seventh chords, major seventh chord, minor seventh chord, major-minor (dominant) seventh chord, half-diminished seventh chord, fully-diminished seventh chord, inversions

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

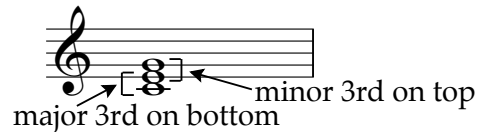
**4.6 Basic Lead Sheet Symbols:** lead sheet symbols for triads, lead sheet symbols for seventh chords, vertical and horizontal slashes

*Section 4.1***INTRODUCING TRIADS****Triad**  
**Root, Third, Fifth**

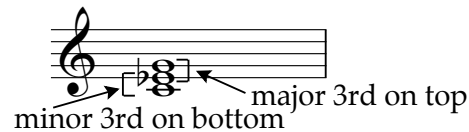
A **triad** is a three-note chord built of **two third intervals** stacked on top of each other. The three notes are called **root**, **third** and **fifth** from bottom to top. In the chord below, the two third intervals are C to E and E to G.

**Major triads**

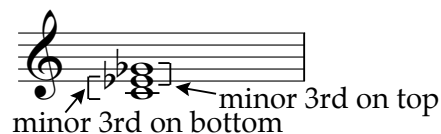
A **major triad** has a **major third** on the bottom and a **minor third** on top. The chord that occurs on the first step of a **major** key is a **major triad**.

**Minor triads**

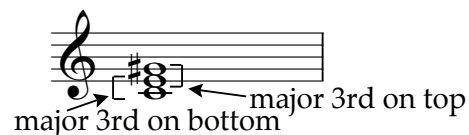
A **minor triad** has a **minor third** on the bottom and a **major third** on top. The chord that occurs on the first step of a **minor** key is a **minor triad**.

**Diminished triads**

A **diminished triad** is a stack of two **minor thirds**.

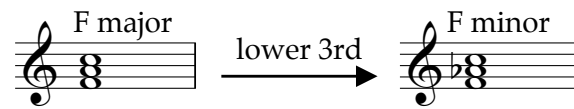
**Augmented triads**

An **augmented triad** is a stack of two **major thirds**.



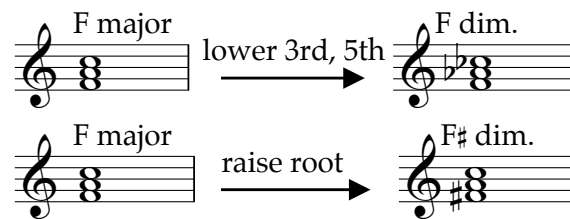
### Spelling minor triads

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



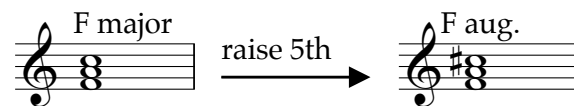
### Spelling diminished triads

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.



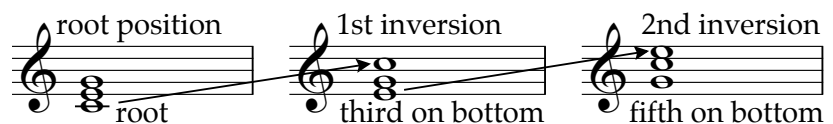
### Spelling augmented triads

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



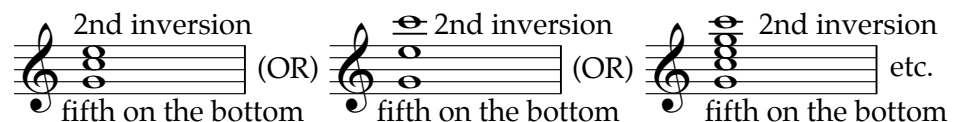
### Root position First inversion Second inversion

**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**.



### 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.



### 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

**M7** major 7th chord = major triad + major seventh = M7 chord (major third on top)

**m7** minor 7th chord = minor triad + minor seventh = m7 chord (minor third on top)

### Major-minor (dominant) seventh

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

**Mm7** = major triad + minor seventh = Mm7 chord (minor third on top)

### 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**.

**ø7** half-dim. = dim. triad + minor seventh = ø7 chord (major third)

**°7** fully-dim. = dim. triad + diminished seventh = °7 chord (minor third)

### 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	C- or Cmin	Cdim or Cmin <sup>b5</sup> or C <sup>o</sup>	Caug or Cmaj <sup>#5</sup>
Major	Minor	Diminished	Augmented

#### Lead sheet symbols for seventh chords

The symbols for seventh chords work similarly:

C <sup>7</sup>	C <sup>Δ</sup> or Cmaj <sup>7</sup>	C- <sup>7</sup> or Cmin <sup>7</sup>
Mm7 ("Dominant" 7th)	Major 7th	Minor 7th
Cmin <sup>7b5</sup> or C <sup>ø7</sup>	C <sup>o7</sup> or Cdim <sup>7</sup>	
Half-dim 7th	Diminished 7th (B <sup>bb</sup> often spelled A <sup>b</sup> )	

#### 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 <sup>7</sup> /B	E D
← B on bottom	← E major triad ← D major triad

#### See also

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